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Stuart Calman
Director
Ministry for the Environment
PO Box 10362
WELLINGTON 6143

via e-mail: emissionstrading@climatechange.govt.nz

Dear Stuart

Draft Climate Change (Stationary Energy and Industrial Processes) Regulations

1. Vector welcomes the opportunity to submit on the Draft Climate Change (Stationary Energy and Industrial Processes) Regulations. Our focus is on those parts of the draft Regulations that deal with natural gas.

Consultation process

2. We would like to start by recording our appreciation for the consultative process followed in developing this set of draft regulations. The use of trusted independent experts, like the Centre for Advanced Engineering and the consultants the Centre engaged, has been a most welcome development.

3. We hope that the process of early, open engagement with industry to develop the technical rules of the ETS will continue across all aspects of scheme design and implementation.

Structure of the submission

4. This submission is structured as follows. We start with some general observations of the challenges in designing methodologies for measuring the potential emissions of greenhouse gases embedded in natural gas. We then outline the criteria we have used to assess the draft Regulations.

5. We then address the specific questions posed in Emissions Trading Bulletin No. 10.

6. The bulk of the submission covers the issues of accounting for emissions when a party opts to be a participant under the ETS and the treatment of losses.

7. A minor issue regarding the format of formulas is discussed in Annex A.

The nature of natural gas

8. Mining and processing of raw natural gas involves converting a heterogeneous mix of hydrocarbons, carbon dioxide, and water into the clean natural gas which is transmitted through a network of pipes. The chemical composition of raw gas varies considerably from field to field and also within a single field from time to time.

9. It is impossible, in a physical sense, to determine the source of the natural gas that is drawn-off the pipelines and used by final consumers. While some contracts for the sale and purchase of gas do specify the field from which the gas is sourced, this is not always the case.

Criteria for judging the draft regulations

10. With the nature of natural gas in mind, we have used the following criteria to assess the draft regulations:

- Are the regulations consistent with the primary legislation;
- Do the regulations “work”, meaning is it actually possible to make the calculations required to determine the quantity of emissions from an activity;
- Are the regulations the lowest cost way of making any required calculations;
- Do the regulations create undue risks to any parties?
- Do the regulations alter the commercial incentives on parties?

11. Regarding consistency with the Act, we have placed some weight on the requirement of Section 62 (b) of the *Climate Change Response Act 2002* (the Act), namely that participants who undertake an activity are obliged to “calculate the emissions and the removals from the activity”. Thus, we have asked the question: will following the procedures in the regulations lead to an accurate calculation of the actual emissions of greenhouse gases into the atmosphere, bearing in mind that it is, in most cases, the eventual combustion of gas that leads to emissions.

12. You will note that these criteria do not match those set out in Emissions Trading Bulletin No. 10. In particular, we have not applied a criterion around

Crown financial advantage or disadvantage. No such criterion is included in the under-lying legislation. As set out in Section 3(1)(b) of the Act, the purpose of the ETS is to support and encourage global efforts to reduce greenhouse gas emissions and to reduce New Zealand's net emissions below business-as-usual levels.

Feedback on issues raised in Emissions Trading Bulletin 10

Standards of testing

13. The Act takes a "self-assessment" approach, under which participants collect required information and make returns, which are subject to later audit by the Chief Executive.

14. The draft Regulations continue this approach, although Regulation 15 does specify that certain standards need to be applied in the measurement and calculation of quantities and composition of gas.

15. What is not specified in the Regulations is the degree of accuracy that will be required of participants.

16. As a minimum, we think that the regulations should mirror Section 63(1) of the Act, and require calculations to be undertaken in units of whole tonnes.

17. Given the newness of the ETS, and given that as currently legislated, there is to be no period of voluntary reporting or mandatory reporting without surrender obligations for the stationary energy sector, we consider it appropriate for the regulations to adopt a liberal stance for the first three years of operation of the scheme, thus allowing a period of "learning by doing".

18. In this regard, we note that there is no requirement in the Act for calculations for the purposes of the ETS to mirror those in the calculation of New Zealand greenhouse gas inventory under the reporting requirements of the United Nations Framework Convention on Climate Change (UNFCCC).

19. Indeed, the Act, at least in the case of fossil fuels, takes a very different approach to that used to develop UNFCCC inventories. As a matter of policy, designed to reduce compliance costs, the point of obligation under the New Zealand ETS is placed as far up the production chain as possible. To realise the compliance costs savings of this approach, it is important that the methodologies in the regulations are based on the "top down" approach of the ETS. The UNFCCC inventory, on the other hand, often takes a "bottom up" approach, aggregating the emissions from down-stream sources into a national total.

20. There are other cases where, as a matter of policy, the government has decided to omit whole sectors of the economy from the ETS (in the case of agriculture accounting for almost half of New Zealand's total emissions), even though these sectors will remain with New Zealand inventory. Thus, the Government has a policy choice to make regarding the materiality of calculations required under the Regulations.

21. On the question of whether "smaller" participants can comply with the proposed regulations, all miners delivering gas into the transmission system must be able to ensure that their gas meets the Specification for Reticulated Natural Gas (NZS 5442:2008), which requires the use of gas chromatography.

Access to data by opt-in participants

22. We comment on the issue of opt-in, including the issue of access to data, below.

Opt-in participants

23. We appreciate that the Act allows parties other than miners to opt-in, so there is a requirement that the regulations allow such parties to calculate their obligations under the Act.

24. That said, we have concerns about the provisions in the draft regulations relating to opt-in.

25. These concerns stem from the fact that what is purchased and delivered through the gas transmission system is chemically different from the raw gas that is mined. Gas delivered from the transmission system - "Specification Gas" - is generally what a party purchases and ultimately combusts.

26. Thus, for the Regulations to be appropriate - especially against the criterion of not altering the commercial incentives of parties - they must ensure that there is a full and correct accounting for all the emissions embedded in the raw gas. Furthermore, the accounting of emissions must be transparent to all parties.

27. The Regulations also need to be consistent with Section 212 of the Act, which "carves-out" the opting-in participant's obligations from those of the mandatory participant.¹

¹ The Section states: "A participant who mines coal or mines natural gas is not required to comply with section 62, report in an emissions return, or surrender units, in respect of coal or natural gas that is purchased by a person who is a participant in respect of an activity listed in Part 4 of Schedule 4."

28. As we read the formulas in clauses 16(4) and 48(1)(a), there appears to be ambiguity, as neither **mined natural gas** nor **opt-in natural gas** are defined terms.

29. In clause 16(4), the miner subtracts from their total emissions the emissions from each class of **mined natural gas** sold to opt-in participants in the year. However, under clause 48(1)(a), the opt-in participant includes in their emissions the emissions from the **opt-in natural gas** purchased by the person from each gas miner in the year.

30. Currently, it is not clear whether **mined natural gas** and **opt-in natural gas** have the same meaning. If "mined natural gas" means raw gas and "opt-in natural gas" means Specification Gas, then it would appear that the regulations mean that the emissions from processing raw gas into specification gas are excluded from the total emissions from the gas industry, when purchasers "opt-in". We do not believe this is what was intended.

31. We consider that opt-in participants should be responsible for the emissions embedded in the gas they have purchased. Based on the current draft of the regulations, this is to be measured at the point of sale. This would mean miners would continue to be liable for upstream emissions including those from own use, flaring, venting and processing.

32. To make this transparent, Vector submits that the regulations be amended to ensure that it is only the obligations of the opt in participants which are removed from the obligations of the miners. This could easily be achieved by utilising a commonly defined term "purchased natural gas" for both clause 16(4) and 48(1)(a).

33. We therefore recommend the following change to the regulations:

- Use the term "**purchased natural gas**", defined to mean natural gas that is purchased from a miner which is to be transmitted through a reticulated natural gas network or, in the case of LPG, bottled;
- In clause 14(4), the miner should subtract from their total emissions the emissions from each class of mined natural gas the **purchased natural gas** sold to opt-in participants in the year; and
- In clause 48(1)(a), the opt-in participant should include in their emissions the emissions of the **purchased natural gas** from each gas miner in the year.

34. In addition, we consider it important in terms of both equity and transparency for all parties in the gas sector, that the principle relating to purchased natural gas is consistent, and applies whether a purchaser is unable to or chooses not to “opt-in”

35. Vector therefore submits that a single default factor should be applied, at the point of sale, to all purchased natural gas. This would provide for both simplicity and transparency for downstream parties while maintaining the appropriate incentives on the upstream participants. The single default factor could be based on gas which meets the specification for reticulated natural gas (NZS 5442:2008) and is transported through the gas transmission network. This is also consistent with the approach taken when accounting for gas held by a person in a storage facility.

36. A single default emission factor for purchased gas, published as part of the Regulations, and then amended as necessary via the MED Annual Energy Data File, also removes the purchaser’s reliance on gaining chemical composition information from the upstream participants. The provision of such technical information (including its verification by opt-in participants and other purchasers) is likely to add compliance costs to the sector. A single default emission factor for purchased gas also removes the complexity of applying multiple factors transparently across a gas portfolio.

37. Vector further submits that having a default emission factor for purchased gas applied at the point of sale is consistent with the methodology proposed for the activity of “Importing natural gas”, where a table of default figures (Table 4) are provided within Schedule 2 of the Draft Regulations.

38. We therefore recommend the following changes to the regulations:

- Amend the formula in clause 16(4) by defining the item “EO” to be the emissions from **purchased natural gas** sold to opt-in participants in the year and state that the emissions factor for that gas will be (53.35 tCO₂-e/TJ);
- Remake clause 49, to specify that the emission from purchased natural gas be the emissions from gas that meets the Specification for Reticulated Natural Gas (NZS 5442:2008) and state that the emissions factor for that gas will be; and
- Add the following table to Schedule 2, and amend Clause 49 accordingly

Table 4a of Schedule 2
Mined Natural Gas

Emissions category	source	Class	Emissions tCO₂e/GJ	factor
Natural Gas		Purchased natural gas	0.053	
		Specification gas (incl storage)	0.053	

LPG

39. Vector would like to highlight what it believes to be an inconsistency in the regulations between the activity of Importing Natural Gas, and Mining Natural Gas with respect to LPG. The methodology for calculating emission of imported natural gas uses a pre-defined emission factor for the class of natural gas as outlined in Table 4 of Schedule 2. This table provides emission factors for Propane, Butane, LPG (at a mix of P60:B40) and LNG. However, when considering the obligations of a participant who mines natural gas (and ultimately the opt-in obligations relating to purchased natural gas), the calculation of emissions for "LPG sales" (i.e. a class of mined natural gas sold) requires the quantities are to be determined through gas chromatography.

40. For consistency, Vector submits that emissions related to LPG as a class of mined natural gas should be calculated using the same default factors that have been provided (Table 4 of Schedule 2) for the activity of Importing Natural Gas. This also provides for the emissions of any mix of LPG, other than P60:B40, to be calculated (on a pro-rata basis) in a consistent manner to if it has been imported. Vector further notes, that the use of the default factors for LPG also apply where an opt-in participant has LPG purchases included in its 2PJ per annum threshold.

41. We therefore recommend the addition of the following table to Schedule 2, with Clauses 16 and 49 amended accordingly:

Table 4b of Schedule 2
Mined Natural Gas

Emissions category	source	Class	Emissions tCO₂e/GJ	factor
Natural Gas		Commercial Propane	0.056	
		Commercial Butane	0.061	
		LPG (P60:B40)	0.060	
		Liquified Natural Gas	0.052	

Losses

42. The draft regulations include in the formula for calculating the emissions from the activity of mining natural gas (clause 16(4)), a factor L for "losses". This factor is, in turn, defined by reference the proportion of total national gas production for the previous year that is attributed to the participant and a figure for national gas losses for the preceding year, both of which figures are to be published by the Chief Executive of the Ministry of Economic Development.

43. As we understand it, the policy issue the inclusion of a losses factor is meant to address is to account for the difference in global warming potential between methane and nitrous oxide that is directly emitted in to the atmosphere and carbon dioxide that is emitted after the combustion of natural gas.

44. Using an "upstream" point of obligation means that all eventual emissions from mined gas are included in the ETS calculations of miners.

45. Total emissions for an individual miner are given by the formula in clause 16(2):

$$[OF \times (A/B) \times C] + (D \times CEF) + (D \times NEF)$$

where—

A is the total mass of CO₂ that results from the complete combustion of the quantity of natural gas for the year;

B is the total mass of the quantity of natural gas for the year;

C is the total number of tonnes of the quantity of natural gas for the year;

CEF is 0.027, the emissions factor for CH₄;

D is total terajoules of the quantity of natural gas for the year;

NEF is 0.031, the emissions factor for N₂O; and

OF is 0.995 (the oxidation factor).

46. The components of the formula "(D × CEF)" and "(D × NEF)", when combined with the oxidation factor "OF", are included to account for the fact that there is incomplete combustion of natural gas; some methane and nitrous oxide will be emitted into the atmosphere.

47. True losses of natural gas (being gas that is released into the atmosphere prior to combustion by an end user) are negligible within the context of New Zealand overall greenhouse gas emissions. Losses from the high pressure transmission system that Vector operates are measured in the hundreds of tonnes, compared with the over 9 million tonnes of emissions annually from the combustion of natural gas. Losses from low-pressure local distribution systems may be higher,

although there is real difficulty reconciling how much of apparent losses represent actual emissions of unburned gas into the atmosphere, versus metering errors and theft (in both cases, the gas is being combusted, it is just that the retailer of the gas is not receiving due payment). Even here, the overall level of true losses is very small, in relative terms.

48. Our first submission, therefore, is that the loss factor be removed from the calculations, on the grounds that it is not material.

49. If officials consider that this amount of emissions is indeed material, and thus that a loss factor is to be included, then its interaction with the oxidation factor in the formula in clause 16(2) needs to be considered.

50. As noted above, the oxidation factor is included to account for incomplete combustion of gas at its end use, although we note that the 2006 IPCC *Guidelines for National Greenhouse Gas Inventories* state that the default oxidation factor is assumed to be 1, unless better information is available².

51. In a memorandum of 2 July 2009, Katherine Wilson of your office proposed that the solution to this issue should be to remove both the factor for losses and the oxidation factor.

52. We are at a loss to understand the logic of this proposal. By “removal of the oxidation factor”, we assume that the formula in clause (2) will become $E = (A/B) \times C$. That is, as the assumption will become complete combustion, in accordance with the *IPCC Guidelines*, there is no uncombusted methane or nitrous oxide for which to account.

53. This will have the effect of **reducing** the deemed emissions from mined gas (because the implicit emissions factor for carbon dioxide is 1, while for methane it is 21 and 310 for nitrous oxide)³.

54. Likewise, removing the factor “L” from the formula in clause 16(4) will **reduce** the amount of total emissions.

55. While on its face beneficial to the gas sector, we think that this approach does not result in a correct calculation of actual emissions of greenhouse gases that result from the mining of natural gas in New Zealand.

² Vol. 2, page 2.6.

³ If the emissions factor for methane and nitrous oxide are to be contained in the formula, we think that there are errors in the factors used. Firstly, the global warming potential of carbon dioxide is 21, not 27. Second, the factor for nitrous oxide should be 0.31, not 0.031. These errors have been carried over into clause 49.

56. Our second recommendation, therefore, would be that better calculations be undertaken to determine an appropriate oxidation factor which represents the true extent of actual emissions of unburned methane and nitrous oxide in New Zealand from all sources (incomplete combustion and true loses) and this figure be used to calculate a single oxidation factor for use in clause 16 (2).

Conclusion

57. Thank you for considering this submission.

58. If you have any queries, or require further information, please feel free to contact me on (04) 803 9034 or via e-mail at peter.wilson@vector.co.nz.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Peter Wilson', with a horizontal line extending to the right.

Peter Wilson
Group Manager Climate Change
Vector Limited

The use of formulas

The draft regulations make extensive use of formulas to explain the calculations that are to be undertaken.

In some instances, items in a formula are represented by a generic letter of the alphabet (A, B, C etc), while in other cases two or three letter acronyms are employed (e.g. "OF" for oxidation factor).

We suggest that the approach taken to formulas in the Income tax Act, where items in formulas are complete words would aid understanding. We present here two examples:

Income Tax Act 2007

CD 44 Available capital distribution amount

Formula for calculating amount of available capital Distribution

(1) For a share (the **share**) on the liquidation of the company, the **available capital distribution amount** is calculated using the formula—

$$(\text{receipt} - \text{asc per share}) \times \frac{\text{capital gains} + (\text{capital property distributed} - \text{cost}) - \text{capital losses}}{\text{total receipts} - \text{total asc.}}$$

Definition of items in formula

(2) In the formula,—

(a) **receipt** is the amount received by the shareholder on the liquidation for the share"

(b) **asc per share** is the available subscribed capital per share calculated under the ordering rule for the share at the time of the liquidation"

(c) **capital gains** is the total of the capital gain amounts available for distribution to shareholders in the company on the liquidation, but excluding any gain occurring when the company distributes property to a shareholder on the liquidation"

(d) **capital property distributed** is the total market value of capital property of the company distributed to shareholders on the liquidation”

(e) **cost** is the total cost to the company of the capital property included in the **capital property distributed** item”

(f) **capital losses** is the total of capital loss amounts of the company arising in the 1992–93 tax year or a later tax year, but excluding any loss occurring when the company distributes property to shareholders on the liquidation”

(g) **total receipts** is the total of all amounts received by shareholders on the liquidation”

(h) **total asc** is the total of the available subscribed capital of all shares in the company at the time of the liquidation.

CX 48 Amounts remitted as condition of new start grant

Excluded income

(2) The remitted liability is excluded income of the person to the extent to which it is the greater of zero and the amount calculated using the formula—

remitted amount – current loss – loss balance – other loss.

Definition of items in formula

(3) In the formula,—

(a) **remitted amount** is the amount of the remitted liability:

(b) **current loss** is the net loss that the person would have for the income year in which the liability is remitted in the absence of this section:

(c) **loss balance** is the loss balance that is available to the person for offset against net income for the income year in which the liability is remitted:

(d) **other loss** is a loss that—

(i) is incurred by a person associated with the person who receives the new start grant; and

(ii) meets the requirements of subsection (4).