

Chair  
Cabinet Economic Growth and Infrastructure Committee

## Proposal

- 1. We propose that the Committee
  - a. agree to the recommended methodologies for the Stationary Energy and Industrial Processes (SEIP) regulations, Unique Emissions Factor (UEF) regulations, and Other Removal Activities (Removal) regulations described in this paper; and
  - b. agree to the revised default emissions factors (DEFs) and other technical changes contained in the Liquid Fossil Fuel (LFF) Amendment regulations necessary to give effect to the UEF regulations for that sector.

## Executive summary

- 2. Under the Climate Change Response Act 2002 (the Act), the SEIP sectors of the New Zealand Emissions Trading Scheme (NZ ETS) enter the NZ ETS from 1 January 2010 and the LFF sector begins mandatory reporting from the same date. Regulations are required under the Act to prescribe methodologies for participants to calculate their emissions and the removals from selected activities.
- 3. A series of consultation activities on the SEIP regulations have taken place. This consultation, and reviews conducted by independent experts, have informed the final package of regulations for which we now seek approval.
- 4. The process outlined in the regulations for estimating the emissions of a mandatory or opt-in participant reflects the following basic formula: a unit of production representing the activity covered by the NZ ETS (plus or minus other factors, such as exports or impurities in the unit of production) multiplied by a default emissions factor (DEF), or by a unique emissions factor (UEF) if the participant has been granted approval to use one.
- 5. Aligning data collection and emissions calculation methodologies with existing business systems where possible allows participants to calculate their emissions with administrative costs minimised.
- 6. The emissions calculation methodologies have been aligned with New Zealand's greenhouse gas inventory (inventory) reporting requirements. This is intended to achieve approximate fiscal neutrality (i.e. participants are required to surrender a similar number of emission units for an activity to the number the Crown is required to surrender), as well as provide appropriate incentives to minimise the overall economic cost of meeting obligations under the Kyoto Protocol and any successor international agreements.
- 7. We recommend that the Committee confirms previous in-principle decisions and agrees amendments to policy to clarify participant obligations

and enable more accurate or simplified reporting of emissions. If approval is granted, drafting instructions will be issued to the Parliamentary Counsel Office (PCO).

## Background

- 8. The Act requires participants in the SEIP sectors of the NZ ETS to enter the scheme from 1 January 2010 and requires LFF participants to undertake mandatory reporting from the same date.
- 9. Section 62 of the Act requires participants to collect data and calculate emissions and removals in accordance with methodologies prescribed in regulations made under section 163 of the Act. Section 164 allows for regulations relating to UEFs if regulations made under section 163 require the use of DEFs.
- 10. Under section 166(3) of the Act, it is necessary for these regulations to be Gazetted no later than 1 October 2009 to come into force on 1 January 2010. The SEIP, UEF and Removal regulations form an overall package of regulations applying to the SEIP sectors. The LFF amendment regulations contain technical changes necessary to enable the UEF regulations to apply to the LFF sector.
- 11. In July 2008, the Cabinet Policy Committee agreed in-principle [POL Min (08) 11/12] to the recommended methodologies for SEIP and Removal regulations and delegated authority to the Minister of Energy and Minister Responsible for Climate Change Issues to approve in-principle emission factors and minor policy changes consistent with the policy intent for the SEIP regulations. On approving the release of the draft regulations for consultation in September 2008, the Emissions Trading Ministerial Group (ETMG) acting under delegated authority [CAB Min (08) 33/17] invited the Minister Responsible for Climate Change Issues and the Minister of Energy to report back to the Cabinet Policy Committee seeking confirmation of previous in-principle decisions and approval for any policy amendments to the final regulations [CBC Min (08) 29/14 refers]. This paper actions this.
- 12. On 20 April 2009, Cabinet agreed [CAB Min (09) 13/6] to a framework for LFF and SEIP participants to apply for a UEF and authorised the Minister for Climate Change Issues to approve the detailed policy for implementation of the framework.
- 13. Cabinet also noted that a final regulatory impact statement would be presented when final policy approval is sought and invited the Minister for Climate Change Issues to report to the Economic Growth and Infrastructure Committee (EGI) on the results of consultation prior to seeking final policy and legislative approval for the UEF regulations. This paper actions these.
- 14. On 25 May 2009, Cabinet agreed [CAB Min (09) 18/1] to prescribe a threshold for eligibility to register as a participant for removals embedded in a product, agreed data collection requirements and a calculation methodology for removals from methanol production and authorised the Minister for Climate Change Issues to approve changes to these.
- 15. The emissions calculation methodologies set out in this package of regulations have been aligned with New Zealand's inventory reporting requirements. This is intended to achieve approximate fiscal neutrality (ie

participants are required to surrender a similar number of emission units for an activity to the number the Crown is required to surrender), as well as provide appropriate incentives to minimise the overall economic cost of meeting obligations under the Kyoto Protocol and any successor international agreements.

- 16. Consideration of submissions received during two rounds of formal consultation, advice from independent experts and ongoing discussions between officials and participants have informed the recommended methodologies. We now seek confirmation of previous in-principle decisions and approval for the proposed policy amendments to the SEIP and UEF regulations.

## Comment

### SEIP regulations

- 17. The process outlined in the regulations for determining the emissions of a mandatory or opt-in participant reflects the following basic formula: a unit of production, representing the activity covered by the NZ ETS (plus or minus other factors, such as exports or impurities in the unit of production) multiplied by a DEF or by a UEF if the participant has been granted approval to use one. This process applies to all SEIP and LFF activities, except for mining natural gas, where stakeholders requested - and expert advice supported - a methodology based on direct measurement of carbon content.
- 18. Aligning data collection and emissions calculation methodologies with existing business systems where possible allows participants to calculate their emissions with administrative costs minimised.

### SEIP emissions factors

- 19. The DEFs for each activity have been reviewed by independent experts. We recommend the DEFs in the SEIP regulations be set according to the best quality data available that is consistent with the approach taken in the inventory. Details of the recommended DEFs for each sector and the reasons for our recommendations are included in Appendix 2.
- 20. It is envisaged that the inventory will be able to utilise revised DEFs in the SEIP regulations or any UEFs for which approval has been granted. However, immediate alignment between the inventory and NZ ETS is not possible in the coal sector. This is because in that sector, the inventory reports according to average emissions factors. The provision of UEFs for the coal sector results in an 'adverse selection' whereby participants with lower observed emissions factors use a UEF rather than a DEF, while overall those using a DEF have above average observed emissions factors.
- 21. This option may result in overall underreporting compared to the inventory and consequently the Crown could receive fewer emissions units from participants in that activity.
- 22. To minimise the fiscal risk to the Crown associated with allowing for coal UEFs, we recommend adjusting the DEFs 0.4 standard deviations above

the average emissions factors for a class of coal with a materiality exclusion threshold for applying for a UEF of one standard deviation below the DEF. This slight adjustment would counter-balance the use of UEFs without too great a cost to participants who fall between the DEF and the UEF threshold. The fiscal risk to the Crown from the potential misalignment between the NZ ETS and the inventory would then be reduced by approximately 60%, reducing the maximum expected potential liability from approximately \$450,000 per year to approximately \$180,000.

## SEIP emissions calculation methodologies

- 23. Section 212 of the Act says that a participant who mines coal or natural gas is not required to comply with section 62 (i.e. collect data and calculate emissions) or report in an emissions return in respect of coal or natural gas that is purchased by an opt-in participant. As it is necessary to bring the regulations into accord with this section, we recommend technical changes to the calculation methodologies to require reporting **net** of this coal or natural gas. However, this requires a degree of cooperation between mandatory and opt-in participants that may or may not already exist and reduces transparency. Cabinet is considering [CAB Min (09) 28/10] an amendment to this section of the Act to require record keeping by the primary participant following opt-in. If legislative approval is granted, it is proposed that consequential amendments to the regulations also follow.
- 24. The recommended methodology and DEFs for fugitive coal seam methane have been amended for consistency with reporting under the inventory. Section 207 of the Act requires participants who mine coal to surrender units in respect of any coal seam gas emissions that result from the activity. As a result of consultation, the opportunity to apply for a UEF for fugitive coal seam gas emissions from underground mines is now provided.
- 25. No emissions calculation methodology has been provided for the activity of producing cable as advice from an independent expert has confirmed that the nitrogen cure process of producing cable in New Zealand does not generate greenhouse gas emissions. Cabinet is considering [CAB Min (09) 28/10] an amendment removing this activity from the Act.

## Natural gas

- 26. The recommended methodology for calculating emissions from the activity of mining natural gas has been revised to require direct monitoring of the carbon content of natural gas sold domestically. Participants will be required to estimate emissions from flaring, venting and gas used during processing according to well-established hydrocarbon accounting systems for process control throughout the industry. These changes are proposed in response to submissions from industry requesting this rather than the use of DEFs. Expert advice confirms that this methodology will provide a more accurate statement of emissions than the use of DEFs and it is consistent with reporting requirements for the inventory.
- 27. This revision has necessitated a change to the methodology for opt-in participants purchasing more than two petajoules of natural gas direct from a

miner. Where data on the actual carbon content of purchased gas is available to opt-in participants, they will report emissions using this. Where this data is not available, opt-in participants will report using field-specific emissions factors published by the Chief Executive of the administering agency.

- 28. The methodology for calculating emissions from mining natural gas has also been simplified by removing both a factor for unaccounted for gas (UFG) – fugitive emissions from the transmission and distribution network – and the oxidation factor. While these do not strictly balance each other, this simplification avoids the complexity associated with proportioning a share of emissions from UFG across the industry and results in a broadly fiscally neutral outcome with a slight bias towards the Crown (we estimate participants may over-report approximately 100,000 tCO<sub>2</sub>e). The majority of participants have indicated that they are comfortable with this proposal.

## UEF regulations

- 29. A framework for SEIP and LFF participants to apply to use a UEF was agreed by Cabinet on 20 April 2009 [CAB Min (09) 13/6]. In accordance with this, the UEF regulations provide for UEFs for all LFF sector activities, and certain activities undertaken by the coal, geothermal and waste combustion sectors.
- 30. There is no option to apply for UEFs for any of the industrial processes activities. This is because the recommended methodologies enable these firms to report emissions in a simplified equation based on pure chemical input and fixed emissions factors. Participants are able to account for impurities or processes that do not give rise to emissions during the particular industrial process and so no UEF process is required. This methodology provides flexibility for participants to determine this variability according to established industry procedures and reduces administrative burdens.
- 31. There is no option to apply for UEFs for the activity of mining natural gas. This is because participants undertaking this activity will be directly monitoring the carbon content of gas, not using a DEF to report on emissions.
- 32. As a result of consultation, an option to apply for a UEF for fugitive coal seam methane from underground mines has been provided.
- 33. Some submitters requested a UEF process to measure emissions from the downstream combustion of coal or natural gas. It is difficult to track coal or natural gas from the upstream point of obligation in the NZ ETS to its ultimate end use. The lack of control of the mandatory participant over these emissions and consequent muted incentive to reduce emissions do not, in our view, justify the complexity of arrangements that would be necessary to achieve this. Much less complicated arrangements could, however, create an appropriate incentive for opt-in participants to calculate plant-specific methane and nitrous oxide emissions factors for fuel combustion. As a result of consultation, this option has been provided for opt-in participants only.

## Threshold for UEF applications

- 34. Submissions received during consultation on the draft UEF regulations focused particularly on the requirement that a proposed UEF be less than a prescribed threshold for eligibility. Submitters from the coal, geothermal and waste combustion sectors requested no threshold be imposed.
- 35. We recommend that there be no threshold for UEF applications for the geothermal and waste combustion sectors. To enable this, we recommend minor changes be made to the UEF framework to enable certain applicants to apply for approval to use a UEF where evidence can be supplied to demonstrate the UEF differs from the DEF by more than the total sampling and testing uncertainty.
- 36. We recommend the ability to prescribe a threshold for UEF applications be retained in the UEF framework. As discussed in paragraphs 20-22 above, UEF thresholds for coal have been set in tandem with DEFs to minimise the fiscal risk to the Crown without disadvantaging smaller participants too heavily.

## UEF verification regime

- 37. Varying views on the verification requirements for UEF applications were received, ranging from support for no verification for UEF applications through to mandatory pre-verification for all emissions returns, as will be required in the Australian Carbon Pollution Reduction Scheme. We do not recommend removing the verification requirements that are currently proposed for UEF applications. These provide the necessary quality control enabling applications to be made without fees.

## Removal regulations

- 38. The purpose of providing for removals embedded in a product is to compensate a person for a pass-through cost imposed by the NZ ETS, to the extent that their activity does not result in emissions in New Zealand. Upstream points of obligation in the NZ ETS increase the price of fossil fuels in the stationary energy and LFF sectors. This is because fuel is assumed to be combusted, resulting in emissions. However, emissions do not result from the proportion of fossil fuel carbon which is embedded in a product.
- 39. Only removals that result in a reduction in emissions reported in the inventory are eligible to earn New Zealand Units (NZUs). Currently, only the activity of methanol production meets this requirement.
- 40. In July 2008, Cabinet Policy Committee agreed in-principle [POL Min (08) 11/12] that “there will be a verification process for participants who embed substances that would cause emissions and thereby carrying out a removal activity”. It was anticipated that the Removal regulations would prescribe a process similar to that recommended for the UEF regulations which any of a number of persons could follow to apply for NZUs for removal activities. However, the recommended methodology for Removal regulations is more akin to the process prescribed in the SEIP regulations, where participants multiply a unit of production by an emissions factor. The Act also requires that only activities recognised in the inventory can be eligible as

Other Removal activities. Consequently, we recommend no verification process be required for methodologies prescribed in the Removal regulations.

## LFF (amendment) regulations

- 41. These regulations are largely technical and are necessary to give effect to the provision made in the unique emissions factor regulations to allow LFF participants to apply for approval to use a UEF in place of a DEF.
- 42. Since the publication of the LFF (amendment) regulations the scheduled annual review of DEFs has found that the DEFs for light and heavy fuel oil require adjustment so that they continue to reflect the characteristics of those fuels. We recommend these DEFs are adjusted accordingly, as outlined in Appendix 3.

## Consultation

- 43. This paper was prepared by the Ministry for the Environment with input from the Ministry for Economic Development and the Ministry of Transport. The Ministry of Agriculture and Forestry, Treasury, Ministry of Foreign Affairs and Trade, and Te Puni Kokiri were consulted on this paper and concur with its recommendations.
- 44. The Department of Prime Minister and Cabinet was informed.
- 45. In accordance with section 166 of the Act, consultation with stakeholders has included two opportunities for formal written submissions on exposure draft SEIP regulations, and one opportunity for formal written submissions on exposure draft UEF regulations, exposure draft Removal regulations, and exposure draft LFF amendment regulations. Consultation has also included engagement with the SEIP Implementation TAG, sector specific workshops for participants, and individual meetings between officials and participants.
- 46. In accordance with section 173 of the Act, material incorporated by reference in the draft SEIP and UEF regulations was made available for inspection during working hours, free of charge, at the offices of the Ministry for Economic Development in Auckland, Christchurch and Wellington from 2 June to 13 July 2009.

## Financial implications

- 47. There are minor potential financial implications from these regulations (refer paragraphs 22 and 28) that would be met within existing appropriations.

## Human rights

- 48. There are no inconsistencies between the proposal and the New Zealand Bill of Rights Act 1990 or the Human Rights Act 1993.

## Legislative implications

- 49. Secondary legislation is required to implement the NZ ETS. Drafting instructions for amendments to the regulations providing for the SEIP sectors to monitor and report on emissions will be issued to the Parliamentary Counsel Office if the recommendations in this paper are approved.
- 50. Approval for submission of the final regulations to the Executive Council will be sought from the Cabinet Legislative Committee when the amended regulations have been drafted.

## Regulatory impact analysis

- 51. The Ministry for the Environment confirms that the principles of the code of Good Regulatory Practice and the regulatory impact analysis requirements, including the consultation RIA requirements, have been complied with. A Regulatory Impact Statement (RIS) was prepared and the Ministry for the Environment considers it to be adequate. The draft RIS was circulated with the Cabinet Paper for departmental consultation.

## Publicity

- 52. We intend to release this Cabinet Paper online so that SEIP participants have early notification of these decisions on their reporting requirements under the NZ ETS.
- 53. A public statement accompanying the Gazetting of regulations is envisaged to advise SEIP sector participants of the detail of their responsibilities under the Act to report on emissions and removals. Detailed explanatory information and guidance materials to support these regulations will be disseminated to provide greater clarity for participants on the nature of their obligations. Regional workshops and individual case management will be undertaken to assist compliance.

## Recommendations

- 54. The Minister for Climate Change Issues and the Minister of Energy and Resources recommend that the Committee:
  - 1. note that the Climate Change Response Act 2002 (the Act) requires participants in the Stationary Energy and Industrial Processes (SEIP) sectors of the New Zealand Emissions Trading Scheme (NZ ETS) to enter the NZ ETS on 1 January 2010, and requires Liquid Fossil Fuel (LFF) sector participants to undertake mandatory reporting from the same date

- 2. note that is necessary to have regulations to support the entry of these sectors into the NZ ETS gazetted by 1 October 2009

## SEIP regulations

- 3. confirm the following in-principle decisions for the recommended methodologies for the SEIP regulations made on 2 July 2008 by the Cabinet Policy Committee [POL Min (08) 11/12] and revised to reflect decisions in recommendation 4:
  - 3.1. mandatory participants will be required to monitor their emissions based on measurement points specific to each activity
  - 3.2. mandatory participants will be required to deduct certain things from their emissions calculation, including tonnes of coal or petajoules (PJ) of natural gas that are exported
  - 3.3. voluntary participants who opt in to the scheme for coal or gas will be required to monitor emissions from the coal or natural gas purchased from their suppliers who would otherwise be required to be mandatory participants for that coal or natural gas
  - 3.4. the calculation of emissions will account for emissions of carbon dioxide, methane and nitrous oxide, and reflect the degree of oxidation, where appropriate
  - 3.5. those who are required to calculate emissions by reference to a default emissions factor in the SEIP regulations will be able to apply for approval by the chief executive of a unique emissions factor where appropriate
- 4. approve the following policy amendments to the SEIP regulations:
  - 4.1. default emissions factors will be based on the best quality data available that is consistent with the approach taken in New Zealand's greenhouse gas inventory
  - 4.2. participants reporting on the activity of mining natural gas, other than for export, will report direct measurements of the carbon content of all gas sold, other than to opt-in participants

- 4.3. participants reporting on the activity of purchasing natural gas from 1 or more participants who mine natural gas where the total natural gas purchased exceeds 2 petajoules per year will report direct measurements of carbon content of all gas purchased where available, or use the appropriate field-specific emissions factors published by the Chief Executive of the administering agency
- 4.4. participants reporting on industrial process activities other than producing aluminium will record the total number of tonnes of pure chemical substance contained in inputs or outputs, determining the proportion of impurity or variability as appropriate according to established industry procedures, and multiply this by a fixed emission factor

#### UEF regulations

- 5. agree minor changes to the framework for LFF and SEIP participants to apply for a UEF from that considered by Cabinet on 20 April 2009 [CAB Min (09) 13/6], so that the process is that outlined in Appendix 1

#### Removal regulations

- 6. note that on 2 July 2008 the Cabinet Policy Committee agreed [POL Min (08) 11/12] that “there will be a verification process for participants who embed substances that would cause emissions, thereby carrying out a removal activity”
- 7. rescind the decision of the Cabinet Policy Committee [POL Min (08) 11/12] as this would create unnecessary regulatory burdens for this activity

#### LFF (amendment) regulations

- 8. agree to the following DEFs for the LFF sector in accordance with the annual review of DEFs for LFF set out in Appendix 3:

Light fuel oil	2.929 (tCO <sub>2</sub> e/kl)
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Heavy fuel oil	3.015 (tCO <sub>2</sub> e/kl)
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## Next steps

- 9. invite the Minister for Climate Change Issues to issue drafting instructions to the Parliamentary Counsel Office to give effect to these recommendations
- 10. invite the Minister for Climate Change Issues to submit a paper on the stationary energy and industrial processes regulations, the unique emissions factor regulations, the other removal activity regulations and the liquid fossil fuel amendment regulations to Cabinet Legislative Committee in order to promulgate these regulations by 1 October 2009
- 11. note that the Minister for Climate Change Issues intends to publish this paper and related Cabinet decisions online, subject to consideration of any deletions that would be justified if the information had been requested under the Official Information Act 1982

[signed by]

Hon Dr Nick Smith

**Minister for Climate Change Issues**

[signed by]

Hon Gerry Brownlee

**Minister of Energy and Resources**

## Appendix 1: Framework for Unique Emissions Factor Regulations

### Application Process

- • Applications to be made to the chief executive of the administering agency.
- • An application must be in the prescribed form, and accompanied by:
  - • any information the chief executive may require; and
  - • a plan for ongoing testing sufficient to identify any material changes to information or factors upon which the proposed UEF is based.

### Information required to support an application

- • Participant name and identifier (if applicable).
- • The NZ ETS activity as set out in the Act (e.g. mining coal).
- • The emissions source category as set out in the SEIP regulations (e.g. the class of coal for coal mining) or the obligation fuel as set out in the LFF regulations.
- • The default emissions factor (DEF) for that emissions source category or fuel.
- • The proposed unique emissions factor (UEF).
- • Information on the derivation of the proposed UEF showing results of calculations, testing and verification, including the estimate for the UEF and variance around that estimate.
- • Information showing that prescribed criteria for a UEF have been complied with, such as:
  - • That the UEF differs from the DEF by more than the total sampling and testing uncertainty, or a prescribed eligibility threshold.
  - • That calculations comply with specified methodologies and testing processes.
  - • That testing processes (including the plan for ongoing testing) and the UEF are verified by a recognised verifier.
- • Proposed parameters for use of the UEF.
- • Any other documentation needed to support the use of a UEF.

## Criteria for a Unique Emission Factor

- • The UEF must vary from a DEF by more than the total sampling and testing uncertainty.
- • The calculation methodologies that must be used by participants to calculate a UEF for a particular product or process, for example:
  - • A formula for calculating CO<sub>2</sub> emissions from each emission source
  - • A formula for including other greenhouse gases in emission calculations (in CO<sub>2</sub> equivalent terms)
  - • Requirements regarding the measurement units to be used in the UEF calculation
- • The testing processes to be used for a UEF, including any standards that must be complied with (e.g. standards for sampling and precision of measurement).
- • Requirements relating to verification of testing and calculation, including that a UEF must be verified by a recognised verifier. Regulations will outline:
  - • Processes for recognition as able to verify information or calculations relating to applications for UEFs for particular activities.
  - • Expertise, technical competence and qualifications required to verify UEFs.
  - • Requirements on verifiers, including the period for which recognition applies, conditions of recognition (such as professional standard requirements, membership of a professional body), reporting requirements, and when recognition may be revoked.

## Other terms and conditions not in regulations

- • Other terms and conditions for use of a UEF may be specified by the chief executive, including:
  - • A timeframe for use of a UEF.
  - • Requirements for reviewing use of a UEF (e.g. if the relevant DEF for a specific activity is amended).
- • Gazetting requirements: section 91(3) of the Act requires that once a UEF is approved, the chief executive must publish:
  - • The name of the participant.
  - • A description of the activity.
  - • The details of the UEF the chief executive has approved the participant to use when calculating emissions or removals for the activity. This could include the UEF figure and the DEF it replaces.

## Appendix 2: Rationale for recommended default emissions factors

Emissions source category	Source of default emissions factors and comment
Importing coal	DEFs for domestic and imported coal are aligned Inventory reporting is based on average properties from coal used in New Zealand, not coal origin UEF process provided
Mining coal	DEFs are set according to survey information on the assumed distribution of emissions factors of New Zealand coals; they are close to, but not completely aligned with, the inventory The DEF is adjusted slightly upwards from the average emissions factor for a class of coal and balanced with a materiality exclusion threshold for UEF applications to reduce the fiscal risk for the Crown resulting from UEFs DEFs for fugitive coal seam methane are those used in the inventory in accordance with the IPCC Good Practice Guidelines and NZ-specific data for sub-bituminous coal UEF process provided for all coals and for fugitive coal seam methane from underground mining
Purchasing coal (opt-in)	DEFs are aligned with those set for mining coal UEF process is provided
Importing natural gas	DEFs consistent with inventory requirements A method for accurately reporting actual LPG composition has been provided

Mining natural gas	No DEFs are provided; carbon content is directly measured or derived Procedures are consistent with inventory requirements
Purchasing natural gas (opt-in)	Participants have the option to measure carbon content directly, or to use a field-specific default emissions factors published by the administering agency Procedures are consistent with inventory requirements
Using geothermal fluid	DEFs are plant-specific rather than field-specific to account for variance in plant processes as well as physical properties of the geothermal fluid DEFs consistent with inventory requirements UEF process provided
Combustion of used oil	DEFs are those used in the inventory: IPCC Tier 1 - Industrial Wastes UEF process provided
Combustion of used tyres	DEFs are IPCC Tier 1 - Industrial Wastes No emissions from this activity are currently recorded in the inventory UEF process provided
Combustion of municipal waste	DEFs are IPCC Tier 1 - Municipal Wastes No emissions from this activity are currently recorded in the inventory UEF process provided
Methane from fuel combustion	DEFs are those used in the inventory: IPCC Tier 2 – industrial boiler performance UEF process provided
Nitrous oxide from fuel combustion	DEFs are those used in the inventory: IPCC Tier 2 - industrial boiler performance IPCC Tier 1 – wood/wood waste (all uses) UEF process provided
Refining petroleum	DEFs aligned with inventory and only company.
Producing: Iron or steel Clinker or burnt lime Glass Gold	Fixed emissions factors based on the chemical reaction of two substances Measurements are based on tonnes of pure substances (for example, calcium oxide in clinker) to reflect these chemical relationships Participants have flexibility to use industry procedures to account for impurities in inputs or outputs measured that would not generate greenhouse gas emissions Differences between inventory and NZ ETS reporting are in appearance only; the same amount of emissions are accounted for under either method

Producing Aluminium	No DEFS are provided Emissions will be directly estimated according to procedures outlined in the International Aluminium Institute's Greenhouse Gas Protocol Procedures are consistent with inventory requirements
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## Appendix 3: Climate Change (Liquid Fossil Fuels) Regulations 2008 – Review of Default Emission Factors

### Background

- 1. The Climate Change (Liquid Fossil Fuels) Regulations 2008 provide default emission factors (DEF) that must be used for each obligation fuel. The emissions factors reflect emissions of carbon dioxide, methane and nitrous oxide.
- 2. The carbon dioxide emission factors have been set by using the New Zealand national inventory energy-based emission factors for carbon dioxide for each fuel (as reported to the UNFCCC under the Kyoto Protocol).<sup>1</sup> Energy data from the New Zealand Refining Company is used as a proxy for all fuel supplied in New Zealand.
- 3. The initial default emission factors were developed using 10-year average data from 1998 through to 2007 based on New Zealand Refinery Company production data which was shown to be reflective of the total market.<sup>2</sup> Where the 10-year data was inconsistent, a shorter time period was used. This applied where there had been a significant change in the quality of the fuel.
- 4. When the Regulations were developed it was intended that the emissions factors be reviewed annually. The first annual review of emission factors was expected to take place in the second quarter of 2009.

### Review of Default Emission Factors

- 5. A review of the default emission factors was undertaken in July 2009.<sup>3</sup> The annual review compared recent fuel quality data with the quality data underlying the default emission factors to ensure the quality remains within 0.5 percent of the quality used to calculate the default emissions factor.
- 6. The analysis revealed that the quality data from 2008 for regular and premium petrol and jet fuel remained within 0.5 percent of the default quality. The quality data for 50ppm diesel from 2008 was outside the 0.5 percent range (0.66 percent). However, the new 10ppm diesel (which replaced 50ppm diesel from 1 January 2009) was inside the 0.5 percent variation. In addition,

when analysed over a three year period (2006-2008), diesel quality remained inside the 0.5 percent variation of the default quality.

- 7. As a result, no changes are proposed for the emission factors for regular and premium petrol, automotive and marine diesel, and jet fuel.
- 8. The quality data for fuel oil from 2008 indicated a variation greater than 0.5 percent: 0.68 percent for light fuel oil and 0.75 percent for heavy fuel oil. When the three-year average was assessed (2006-2008) there was also more than a 0.5 percent difference from the default data. It appears that from 2006 the fuel oil produced by the New Zealand Refinery Company became heavier and the energy content increased on a volume basis.
- 9. Based on these findings, it is proposed to adjust the emissions factors for light and heavy fuel oil, as shown below:

<b>Class of fuel</b>	<b>Existing emission factor (tCO<sub>2</sub>e/kl)</b>	<b>New emissions factor (tCO<sub>2</sub>e/kl)</b>
Light fuel oil	2.908	2.929
Heavy fuel oil	2.999	3.015

- 10. Note that because it is proposed to change the default emission factor for heavy oil, it may be necessary to also review the emission factor for the “any other fuel” class. This emission factor was originally set by multiplying the emissions factor for heavy fuel oil by 110 percent. Its purpose is to provide a default factor and conservative backstop for any fuel not covered by any other default or unique emission factor.
- 11. In order to keep the “any other fuel” emission factor 10 percent above the emission factor for heavy fuel oil, the factors would need to change from 3.299 tCO<sub>2</sub>e/kl to 3.317 tCO<sub>2</sub>e/kl. However, because the “any other fuel” emission factor only provides a conservative backstop and there is no fuel that actually has such a high emission factor, it is also possible to keep the factor constant. Thus, it is proposed not to change the default emission factor for the “any other fuel” class and instead keep this factor constant from now on.

1 An oxidation factor of 99 percent has been applied to the carbon dioxide emission factor. This is sourced from the *2000 Intergovernmental Panel on Climate Change Guidelines for National Greenhouse Gas Inventories*. Emission factors to reflect nitrous oxide and methane as well as relevant global warming potentials are sourced from the same document.

2 See Discussion Paper on Emissions Trading Scheme Methodology for MFE by H&T November 2007

3 A detailed description can be found in Hale & Twomey, Update of Default Emissions Factors 2009, July 2009