Emissions trading bulletin

Draft climate change regulations for stationary energy, industrial processes and liquid fossil fuels

No 10, June 2009

Introduction

This bulletin explains the following regulations and should be read alongside them.

- Climate Change (Stationary Energy and Industrial Processes) Regulations 2009
- Climate Change (Unique Emissions Factors) Regulations 2009
- Climate Change (Other Removals Activities) Regulations 2009
- Climate Change (Liquid Fossil Fuels) Amendment Regulations 2009.

The Climate Change Response Act 2002 (the Act) creates obligations to report greenhouse gas emissions for the New Zealand Emissions Trading Scheme (NZ ETS) participants in the stationary energy and industrial processes (SEIP) sectors from 1 January 2010.

The Government wishes to apply the Act in a way that minimises compliance and administrative costs, and treats all participants fairly. The principles underpinning the methods for calculating emissions are that they should:

- neither advantage nor disadvantage the Crown fiscally ie, result in a true reflection of New Zealand's Kyoto liability
- send a clear price signal, with no perverse incentives
- minimise transactional costs for participants and the Government
- provide for an accurate and verifiable statement of emissions.

These regulations therefore aim to establish practical and accurate methods by which participants can meet their reporting obligations under the NZ ETS. The requirements for data collection and verification are intended to provide the right balance between simplicity and the robustness of emissions returns.

The draft regulations

The draft SEIP regulations set out methods for participants to monitor and calculate their emissions from activities specified in Part 3 or 4 of Schedule 3 of the Act or part 4 of Schedule 4 of the Act. A first draft of these regulations was released for consultation in October 2008. Draft regulations are being released again for consultation so interested people have the opportunity to see how previous comments have been incorporated into the regulations and to provide further feedback on the updated regulations.

Draft unique emission factors regulations provide a process to enable certain participants in the SEIP and liquid fossil fuels (LFF) sectors of the NZ ETS to apply for approval to use a unique emissions factor (UEF) in place of a default emissions factor when calculating their emissions. The regulations outline the calculation and testing processes and standards that must be used to support an application to use a unique emissions factor. The regulations also outline a verification regime. The draft LFF amendment regulations enable the unique emissions factor regulations to apply to the LFF sector.

Draft removal activities regulations provide a process to enable participants to receive New Zealand units for activities that remove emissions, if certain conditions are met.

These regulations are being released together so participants can see how they interface. In short, if approved, a unique emissions factor can be used in place of a default emissions factor to calculate and report on emissions in accordance with the SEIP regulations, while the removal activities covered are removals from obligation fuels specified in Schedule 3 of the Act.

Your comments on the draft regulations

Comments on any or all of these regulations are welcomed from participants who have obligations under the NZ ETS and other interested people.

The final section of this bulletin outlines the process for making a submission on the regulations, and where to go for more information. The closing date for making a submission is **5pm on 30 June 2009**.

Cross-cutting issues

The following issues are relevant to the full package of regulations.

Methods for calculating emissions

This package of regulations provides a method for participants in the SEIP sectors to report their emissions. It should provide for individual variation of product or process, for consistency of measurement and fair treatment of participants.

The previous round of consultation on these regulations addressed two broad ways in which regulations might provide for participants to calculate their emissions:

- specifying the data or other information that participants must collect, and setting out how that data is to be used to calculate actual emissions
- providing default emissions factors by which each unit of production can be multiplied to determine obligations but allowing individual participants to apply for unique emission factors, if conditions are met.

Both these approaches have been used in the current package of regulations. For participants in the LFF, coal, waste and geothermal sectors, processes for calculating a unique emissions factor have been outlined. For participants in the gas sector and industrial processes sector, processes for calculating actual emissions have been outlined. Feedback on these two broad approaches is welcomed.

Point and unit of measurement

In a number of cases, the point of measurement has changed from the point of valuation to the point of sale. As this is central to the way in which emissions calculations are specified, comments are specifically sought on these approaches.

Comments were received from various submitters requesting further clarity on definition of units of measurement and other terms. In a number of cases, this has been done. In others, standards and guidelines will be developed in consultation with participants to provide consistency and guidance on these matters. These will cover issues such as the units of measurement for calorific value, and ensuring measurement of both tonnes and calorific value of coal are done on the same basis (whether this is an as-received basis, dry basis or dry ash-free basis). Details on how to participate in the process to develop standards and guidelines are outlined at the end of this bulletin.

Thresholds for participation

The Act does not specify a threshold for becoming a participant in the NZ ETS for the following activities:

- importing coal
- using geothermal fluid for the purpose of generating electricity or industrial heat
- combusting used oil, waste oil, used tyres or waste for the purpose of generating electricity or industrial heat.

It is proposed that thresholds for each of these activities be created under section 60 of the Act. Feedback on the level or type of thresholds that might be set, and the reasons for this, is welcomed. Further consultation on the development of thresholds will be undertaken with interested people.

Relevant criteria for assessing any such threshold include:

- the overall compliance and administrative cost
- the viability of monitoring and verifying emissions from sources falling below and above any proposed threshold
- the need to maintain the environmental integrity of the NZ ETS, including consistency of thresholds
- the prevention of double-counting or perverse incentives
- the relative costs of the exemption created by such a threshold, including who bears these costs.

Emissions factors

The draft SEIP regulations contain a series of default emissions factors (DEFs) for each stationary energy or industrial process activity or, in some cases, subset of activities, for example mining different types of coal. These DEFs have been reviewed by independent parties and additional information provided in some cases.[1] There are some changes to these emissions factors from the previous draft of the regulations. Further information showing the emissions factors and their derivation is provided in the appendices to this bulletin. Specific issues where comments are sought relating to DEFs are identified below in comments on each sector.

A number of considerations have influenced the setting of DEFs.

- Where there is a clearly identified emissions source, the default emissions factor is intended to reflect the actual emissions of that source, for example DEFs for specific electricity generation plants that use geothermal steam.
- For industrial processes, DEFs are based on fixed chemical ratios arising from the reaction of two substances, for example the emissions factor for carbon used as a reducing agent in steelmaking has been set at 3.67, in accordance with the chemical equation in which all carbon forms CO_2. Emissions equations outlined in the regulations are based on pure chemical content of inputs to reflect this. Guidance on methods for assessing the pure chemical content of raw materials will be provided in consultation with participants.
- Emissions factors for coal and waste combustion will apply to multiple participants undertaking an activity. These emissions factors are discussed further under the specific sectors. In general, DEFs are based on those used in the New Zealand Greenhouse Gas Inventory,[2] and may be New Zealand-specific or as outlined in the IPCC 1996 guidelines.[3] Although the IPCC 2006 guidelines update the 1996 figures, they will not become part of the international reporting requirements which guide the New Zealand Greenhouse Gas Inventory until at least commitment period 2 of the Kyoto Protocol, starting in 2013. The 1996 IPCC factors will be used in the NZ ETS until the New Zealand inventory reporting is revised to report emissions on the basis of the 2006 guidelines.
- Using a DEF may overestimate emissions from a participant whose observed emissions factor is lower than the DEF, so a process for seeking approval to use a unique emissions factor (UEF) has been included in the draft regulations. A threshold of divergence from the DEF has also been set before approval to use a UEF will be granted. This is intended to preserve a fiscally neutral outcome for the Crown and to minimise inequities for smaller participants who may find it difficult to bear the costs of applying for a UEF.
- DEFs have been rounded in accordance with independent specialist advice on sampling and testing accuracy, and confidence intervals associated with average emissions factors. Feedback is welcomed on appropriate rounding.

Fees

No fees are proposed for emissions returns for SEIP activities and for removal activities, nor for applications for UEFs. However, participants seeking approval to use a UEF will be expected to meet the full costs of any sampling, testing and verification required in the regulations before an application is submitted for consideration.

1 The SEIP sector reports from independent specialists are currently in the final editing stages. These will be published on www.climatechange.govt.nz once the editing process is complete.

2 Ministry for the Environment. 2009. *National Inventory of Greenhouse Gas Emissions and Removals*. Submitted to the United Nations Framework Convention on Climate Change. 15 April 2009. Ministry for the Environment, Wellington.

3 IPCC. 1996. Houghton JT, Meira Filho LG, Lim B, Treanton K, Mamaty I, Bonduki Y, Griggs DJ, Callender BA (Eds). IPCC/OECD/IEA. *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.* UK Meteorological Office: Bracknell.

Draft Climate Change (Stationary Energy and Industrial Processes) Regulations 2009

Introduction

Regulations made under section 163 of the Climate Change Response Act 2002 set out methods for registered participants to monitor and calculate their emissions from activities specified in Part 3 or 4 of Schedule 3 of the Act or part 4 of Schedule 4 of the Act. These activities are:

- importing coal
- mining coal where the volume of coal exceeds 2000 tonnes in a year
- importing natural gas where the volume of natural gas imported exceeds 10,000 litres in a year
- mining natural gas, other than for export
- using geothermal fluid for the purpose of generating electricity or industrial heat
- combusting used oil, waste oil, used tyres or waste for the purpose of generating electricity or industrial heat
- refining petroleum where the refining involves the use of intermediate crude oil products for energy or feedstock purposes
- producing iron or steel
- producing aluminium, resulting in the consumption of anodes or the production of anode effects
- producing clinker or burnt lime, resulting in calcination of limestone, or calcium carbonates
- producing glass using soda ash
- producing gold
- producing cable using a nitrogen cure process
- purchasing coal from one or more participants who mine coal where the total coal purchased exceeds 250,000 tonnes per year
- purchasing natural gas from one or more participants who mine natural gas where the total natural gas purchased exceeds two petajoules per year.

Stationary energy

Coal

A key change from the previous draft regulations is that the point of measurement for mined coal has been changed from the point of valuation to the point of sale as measurements of coal are already taken at this point. Using this point of measurement better meets the criteria outlined in ETS Bulletin No. 8 and eliminates the need for a stockpile adjustment for mined coal. Coal miners are now required to measure coal only at the point of sale, coal for their own use (ie, combusted before the point of sale) and coal gifted. Feedback is sought on this approach.

Coal stockpile adjustments for purchased and imported coal are provided for in a schedule to the regulations. The method for calculating a coal stockpile adjustment remains broadly the same. The Act requires separate reporting for separate activities in the NZ ETS (eg, importing and purchasing coal), and it is necessary to account separately for different classes of coal (eg, coal to which a DEF or UEF applies).

However, compliance costs of requiring a separate stockpile for different activities or classes of coal would be considerable for participants. Therefore, the new provisions for coal stockpile adjustments provide a way of assigning parts of a single stockpile to more than one activity or class of coal. Feedback is welcomed on the approaches used to address coal stockpile issues.

In response to feedback, DEFs for the coal sector have been independently reviewed by a specialist consultant and are revised in the draft regulations. Data provided by the consultant on the average emissions factor and distribution of emissions factors for each class of coal mined in New Zealand has been used to derive these revised DEFs. Both mined and imported coal now have the same set of emissions factors. This also provides consistency between the way imported and mined coal are treated in New Zealand's Greenhouse Gas Inventory and the NZ ETS. The DEFs remain energy-based rather than set according to carbon content or mass, as was recommended in the SEIP Technical Advisory Group report published in October 2008.

A further consideration involved in the revision of the DEFs for the coal sector has been the provision made to apply for approval to use a UEF. Eligibility thresholds have been set for approval to use a UEF. It is expected that participants with emissions factors below the eligibility threshold for obtaining a UEF will apply for approval to use a UEF.

The result of such 'adverse selection' means the remaining participants to which DEFs apply will have emission factors that are greater than the average emissions factor for a specific activity. Therefore, it is necessary to set DEFs above average emissions factors for a class of coal to counter-balance the use of UEFs, and more accurately reflect the actual emissions from participants' activities which will be using DEFs in emissions returns. Eligibility thresholds for UEFs and DEFs for the coal sector have been set at levels intended to deliver fiscal neutrality for the Crown and to minimise inequities for smaller participants. Further detail is contained in Appendix 4.

It is intended that DEFs will be amended periodically. The time period for review will be, at a maximum, the time period for review of the Act. The first review of the Act must be concluded by the end of 2011. It is also intended that DEFs will be reviewed as and when better information on emissions factors exist, including the information gathered from UEF applications.

A number of submissions on the previous draft SEIP regulations commented on the provisions made for fugitive coal seam methane. Officials are aware that the high variability of coal seam properties in New Zealand means there are measurement and sampling issues, and safety issues involved in measuring fugitive coal seam methane emissions.

However, the Act includes a liability for fugitive methane emissions from coal mining to be included in the NZ ETS for coal mining participants. Consequently, the draft regulations retain a default process to use in calculating liability for fugitive coal seam methane emissions in accordance with the 1996 IPCC guidelines. Officials are aware that the properties of New Zealand coalfields will likely mean these IPCC default factors will differ from emissions from New Zealand mines. Further feedback is sought from coal miners on the treatment of coal seam methane in the NZ ETS, and how this can be best measured and reported.

Gas

In response to issues raised by submitters on the previous draft of regulations, and based on advice from an independent contractor, the method for calculating emissions from gas mining has been substantially revised.

The revised method is based on continuous measurements of gas volume and properties which effectively provides for unique emissions factors for gas miners. It is intended this method more accurately captures gas mining activities across the industry and provides clarity over how to account for the various emissions associated with gas mining.

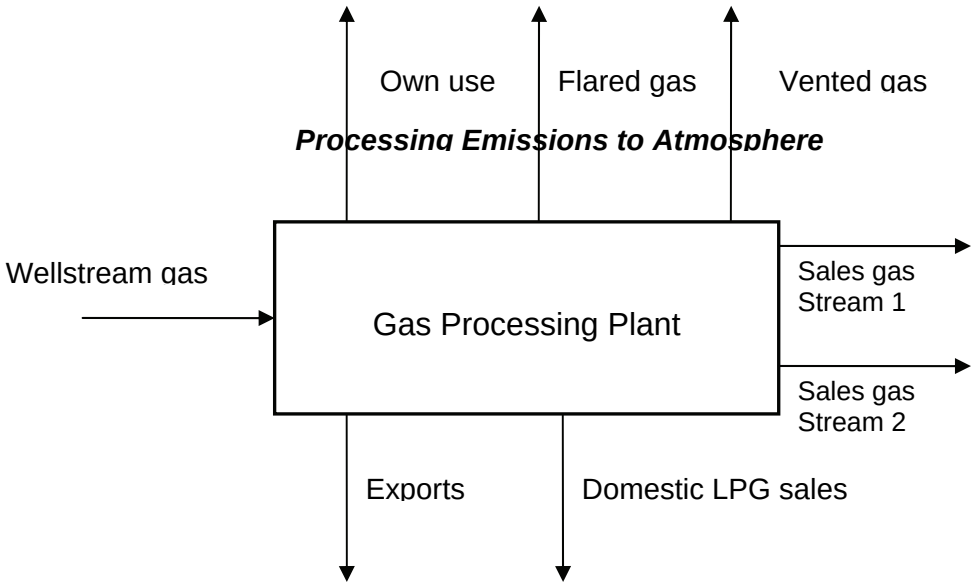
A key principle underpinning the revised method is that measurement and reporting systems should be based on robust existing information systems where possible. Consequently, gas chromatographic analysis (GCA) at the point of sale forms the basis of the method for calculating emissions. The draft regulations specify ways in which data measured by or derived from GCA should be used to calculate and report emissions, which are intended to be broadly similar to those used in existing hydrocarbon accounting systems.

Standards for sampling and testing using GCA have been specified in the draft regulations to ensure consistency and quality of measurement by all participants. Feedback is sought on whether both smaller and larger participants can meet these standards and on the practicality of the method for smaller participants.

At present there are no verification requirements for the sampling and testing regime prescribed. However, consideration is being given to this and feedback is welcomed on what an appropriate verification regime might be for the draft method.

New definitions for 'classes' of gas are included in the revised method. These classes are intended to reflect the configuration of emissions from processing plants at the point of obligation ie, plants processing mined gas. The revised method requires all the 'streams' or 'classes' of gas exiting the processing plant to be accounted for.

The following schematic outlines this configuration and classes.



Some default emissions factors remain in the revised method. These provide factors for the non-CO_2 emissions associated with eventual downstream combustion of gas, and a factor to enable provisions for storage adjustment. At present, there are no provisions to apply for approval to use a UEF for gas sector activities. However, using continuous measurement means that changes in gas properties over time are effectively accounted for.

A number of submitters commented on the provisions for 'unaccounted-for gas' (UFG) in the previous method. A new factor for 'losses' replaces this UFG factor in the revised equation. Losses from the transmission and distribution network and from UFG are accounted for in New Zealand's Greenhouse Gas Inventory and form a part of New Zealand's overall emissions liability. Due to the difficulty of measuring this, the revised method adds an amount for losses to each participant, which divides the total national losses by that participant's share of national gas production, as specified in the annual report on New Zealand Energy Greenhouse Gas Emissions. This report is published annually in July or August at http://www.med.govt.nz

The revised method for gas mining has led to changes in the method for opt-in gas sector participants to calculate their emissions. The point of measurement has changed to the point of sale. This makes reconciliation between obligation and opt-in participants simpler. However, only gas purchased by an opt-in participant can be subtracted from the emissions return of the obligation participant. The method requires the opt-in participant to report emissions using the same information as an obligation participant. This requires that the opt-in participant can access the required data. Feedback on this approach is welcomed.

A storage adjustment provision has been included for opt-in participants. A DEF has been used for this, but as the same factor is applied to natural gas going both in and out, the result should be effectively neutral.

The method and emissions factors for importing gas have also been reviewed by an independent contractor. No changes have been made to this method.

Officials are interested in discussing the changes to the gas mining method with participants during the consultation period.

Geothermal

In response to feedback from submitters and advice from an independent consultant, the classes of geothermal resource have been re-defined and now relate to specific geothermal plants, rather than geothermal fields. Consequently, plant-specific DEFs are used in these regulations. A DEF for 'all other' geothermal participants has been set at the highest relevant class. Current or future geothermal energy users without a plant-specific DEF will have to use this factor or apply for a UEF.

Feedback is welcomed on the revised geothermal classes and associated DEFs.

The regulations have also been revised to provide for differences in geothermal plant design that affect the workability of data collection and the method for calculating emissions. Different requirements apply to uses of geothermal steam (the majority of geothermal plants) and uses of geothermal fluid heat (for example the Tauhara Industrial Use Facility).

For uses of geothermal steam, the point of measurement has been changed from the wellhead to the separation point or mixing point where steam is delivered in multiple transmission pipelines. This is intended to provide for simpler and more accurate measurement of steam flow. As there is likely to be more than one steam measuring point for each plant, DEFs have been calculated as a weighted average of emission factors in steam flows.

Provisions have now been included in the UEF regulations for calculating emissions relating to condensate reinjected and geothermal fluid used in industrial heat. Approval to use UEFs can be sought by all users of geothermal fluid and steam. A threshold of 5 per cent divergence from the DEF has been set based on the uncertainty inherent in measurement and testing procedures.

Combustion of waste

There has been a complete rewrite of the SEIP and UEF regulations for calculating emissions from burning waste oil, used oil, tyres and waste for generating electricity or industrial heat. This is in response to feedback and is based on the advice of a specialist independent consultant.

Classes of waste and DEFs have been revised to provide greater clarity and align with the IPCC Good Practice Guidelines which form the basis of the New Zealand Greenhouse Gas Inventory.[4] Biogas and biofuels are not included in the classes that these regulations apply to. Emission factors are also expressed in a different unit (tCO_2-e/TJ).

Many submitters on the previous draft regulations focused on combusting biomass materials, including waste wood. CO_2 emissions from combusting biomass are not counted in these regulations as they are effectively covered under the forestry regulations.

However, in response to feedback, a separate method requiring the use of continuous monitoring equipment positioned within stacks has been included in the draft UEF regulations. Participants applying for a UEF for biomass combustion must use this method, but it may also be used by participants combusting blended or waste fossil fuels. This method still requires sampling and testing fuels to determine energy content.

A minimum threshold for combustion of biomass will be developed separately from a general threshold for waste combustion. An important principle of designing a threshold will be to ensure there is no disincentive for efficient use of wood waste as an alternative to fossil fuel use. Feedback on minimum thresholds is welcome.

The equation in the draft SEIP regulations relating to combustion of used tyres has been revised to clarify that the biomass fraction is not included in the emissions calculation. However, as CO_2 from this biomass fraction is counted under the IPCC Guidelines, an adjustment has been included in the equation to calculate total emissions. Feedback is welcome on this proposed approach, including on the sampling and testing methods.

Refining

Regulations for refining activities remain unchanged from the previous draft of the regulations.

Opt-in participants

The point of measurement for coal and gas sector opt-in participants will be the point of sale. A consistent point of measurement for obligation and opt-in participants is necessary to ensure integrity of the overall scheme. Revisions to the data collection and emissions calculation requirements for opt-in participants have been made to reflect this change and the revised emissions factors. Feedback on this approach is welcomed.

Some submitters from the natural gas sector noted that, under the current opt-in provisions in the legislation, they would not be able to opt in. The legislation is based on buying natural gas from a gas

[4] Intergovernmental Panel on Climate Change. 2000. *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*. J Penman, D Kruger, I Galbally, T Hiraishi, B Nyenzi, S Emmanul, L Buendia, R Hoppaus, T Martinsen, J Meijer, K Miwa and K Tanabe (eds). Hayama, Japan: IPCC National Greenhouse Gas Inventories Programme, Technical Support Unit.

mining participant, meaning that for some gas users, although their total use of natural gas is more than 2PJ, they cannot opt in for their gas use as some gas is bought from wholesalers rather than directly from gas mining participants. Although opt-in provisions for natural gas users would enable these users to manage their liabilities directly, there are considerable practical difficulties associated with adopting a model allowing for opt-in more than one step removed from the point of obligation. Amending opt-in provisions for natural gas users would require an amendment to legislation, rather than regulations.

Similarly, some geothermal submitters noted that they would like the option to opt in for their geothermal liability. Providing the ability for geothermal users to opt in would require an amendment to legislation. Officials do not consider that an ability to opt in for geothermal fluid use is required, as the point of obligation in the legislation is defined as the user of geothermal fluid, rather than the owner, and geothermal default emissions factors are defined at a very specific level. We welcome feedback on this approach; in particular, whether there are any specific issues involving determining liability for emissions from use of geothermal fluid where there is more than one user of the same geothermal fluid, for example one large user is downstream of another.

Industrial processes activities

Some amendments to the emissions calculation equations for industrial process activities have been made so that the amount of pure chemical substance used in each process (carbon, calcium oxide, calcium carbonate, magnesium oxide) is the key variable in the equation. This is a change from the previous regulations and is intended to provide for variation in input and production process without the need to obtain approval for a UEF. Further explanation of the rationale for this position can be found in the commentary on the UEF regulations below.

Standards and guidelines will be developed on how to measure total chemical content in the raw materials used in many processes. These will provide consistency of measurement between participants and certainty on how to complete an emissions return to comply with obligations under the Act. Officials welcome the involvement of participants in the development of these standards and guidelines. Details of how to participate in the process to develop these guidelines are outlined at the end of this document.

Additional industry-specific details follow.

Steel

The regulations now clarify that reducing agents for which an emissions charge has already been paid, and carbon inputs generating minimal emissions, should not be included in the calculation of emissions from producing iron or steel. In addition, the regulations have been changed to remove iron sand and iron ore from the emissions calculation, as officials understand there is no carbon contained in iron sand, and iron ore is not used in New Zealand. Therefore, there is no need for participants to record this information.

As the equation now multiplies total carbon content, rather than tonnes of reducing agent, the emissions factor for carbon used in steel production remains 3.67.

Aluminium

In response to feedback, regulations relating to the production of aluminium have been modified to clarify how information must be collected. No emissions factors are required for calculation of emissions from aluminium production as modifications have been made to the method, so carbon dioxide is directly estimated in accordance with the Aluminium Sector Greenhouse Gas Protocol.

Production of cement clinker or burnt lime

An additional variation has been added to the emissions equation for the production of cement clinker or burnt lime to account for emissions from partially calcined cement kiln dust (CKD). A CKD correction factor has been included in the regulations for participants to use for a manufacturing process where CKD is emitted. As data on CKD is very scarce, the default correction factor in the IPCC Good Practice Guidelines has been adopted. For processes where no CKD is emitted, this factor will not be used.

Glass production

No additional changes have been made to the method of calculating emissions from glass production.

Gold production

Officials are aware that not all of the limestone used in gold production causes emissions. However, further information is required to identify what specific proportion of limestone use results in emissions before a more accurate emissions factor can be included in the regulations. Feedback on the accuracy of the gold-mining emissions factor is sought.

Cable production using a nitrogen cure process

Following review of regulations by an independent party, it has been determined that the nitrogen used in cable production in New Zealand does not, of itself, generate greenhouse gas emissions. In light of this information, the regulations for cable production have not been amended at this stage. Further consultation with participants will be undertaken to progress this issue.

Draft Climate Change (Unique Emissions Factors) Regulations 2009

Introduction

The Act provides for the use of unique emissions factors (UEFs) in place of a default emissions factor (DEF) in completing an emissions return. A UEF is a participant-specific factor by which each unit of production (eg, input or output) of a participant's activity is multiplied to calculate emissions.

Using a DEF may overestimate emissions from a participant's activities where actual emissions are less than emissions calculated using the relevant DEF. Such a participant will then be required to surrender more emission units than actual emissions. If a DEF for a specific activity was set at the average of emissions data for an activity, approximately half of participants could be overcharged in this way.

In addition, use of DEFs does not provide an incentive for participants to reduce emissions by using lower-emission inputs or production processes. These issues can be overcome by allowing participants to apply for a UEF to use in place of a DEF when calculating their emissions. Opt-in participants will be able to apply for a UEF.

UEFs coverage: classes and thresholds

The Climate Change (Liquid Fossil Fuels) Regulations 2008 and the draft Climate Change (Stationary Energy and Industrial Processes) Regulations 2009 contain default emissions factors for each liquid fossil fuels (LFF), and stationary energy and industrial processes (SEIP) activity.

The UEF regulations provide for UEFs for all LFF sector activities, and the coal, geothermal and waste combustion sectors.

The UEF regulations do not provide for UEFs for refining petroleum or producing gold, because only one firm will be subject to NZ ETS obligations for each activity so the relevant DEF should accurately reflect emissions. No provision for UEFs is necessary for the gas sector as the method of calculating emissions is based on continuous measurement. Similarly, the UEF regulations do not provide for UEFs for producing steel, aluminium, clinker or burnt lime, or glass. This is because emissions from these activities are linked to a process where each tonne of a specified input results in a fixed volume of emissions, for example for steel production, one tonne of carbon in a reducing agent will result in 3.67 tCO_2-e of emissions.

Furthermore, data upon which DEFs are based is standardised by measuring inputs without impurities. For example, for steel production the reducing agents' DEF is based on the amount of carbon in reducing agents rather than the amount of a reducing agent. Standardised data for emissions linked to processes mean there will be no variance between actual emissions and emissions calculated using relevant DEFs.

The UEF regulations restrict the class of fuel to which a UEF may apply. Restrictions on UEF classes are necessary to ensure the data on which a UEF is based, and ongoing testing, is representative of the whole UEF class. It is also necessary so that UEFs can be used for international reporting in New Zealand's Greenhouse Gas Inventory. UEF classes are restricted by prescribing maximum subsets of a fuel to which a UEF may apply (eg, coal from a designated mine). A UEF class may be smaller than a prescribed maximum subset (eg, it may be coal from one part of a mine), but must have well-defined parameters.

The UEF regulations require that a participant's proposed UEF is less than a prescribed threshold for eligibility to apply for a UEF. The rationale for thresholds in each sector is as follows.

- For the LFF sector, a proposed UEF must be more than 2 per cent below the relevant DEF. It is not expected there will be a wide variation in the emission factor for each obligation fuel supplied by each participant and the DEFs have been set to reflect the average emissions arising from the use of each fuel. Therefore, the threshold is intended to restrict UEFs to new types of fuel. The obligation fuel entitled 'any other liquid fossil fuel' is intended as a catch-all category in case a fuel is supplied that does not fit into any of the other obligation fuels. While its DEF has been set deliberately high, it is proposed that the 2 per cent threshold should apply to be consistent with other liquid fuels.
- For the coal sector, UEF thresholds have been set in tandem with DEFs as outlined above. Further detail surrounding the setting of coal DEFs and UEF thresholds is contained in Appendix 4.
- For the geothermal sector, UEF thresholds have been set on the basis of sampling and testing accuracy. This is intended to ensure a UEF applies only where actual emissions are less than those calculated using the DEF.
- For the waste combustion sector, UEF thresholds have been set on the basis of confidence intervals associated with DEFs. These thresholds have been used because insufficient data exists on the uncertainty associated with the sampling and testing regime for calculating a UEF for waste combustion. This is intended to ensure a UEF applies only where actual emissions are materially less than those calculated using the DEF.

Framework: sampling, testing, calculation and verification

Officials have obtained independent technical advice on appropriate sampling, testing and calculation requirements for applying for a UEF for each sector. To obtain a UEF, participants must comply with specified sampling and testing standards for that sector. Once sampling and testing has been undertaken by a participant, testing results must be used to calculate a UEF in accordance with prescribed calculation methods for each sector.

Finally, compliance with sampling, testing and calculation requirements must be verified by a recognised verifier.

The draft regulations specify a number of standards for sampling and testing to determine a UEF. All such material proposed to be incorporated by reference is available for inspection free of charge during the consultation period. Details of how to access this material is outlined at the end of this bulletin.

The draft UEF regulations prescribe a verification regime for applications for approval to use a UEF. This regime specifies that such an application be accompanied by a statement – which is signed by a recognised verifier – certifying that the sampling and testing regime prescribed in the regulations has been adhered to and that the calculations have been made correctly and in accordance with the prescribed equation.

The regulations also specify a process by which a verifier may be recognised to provide such a statement. As the verification requirements are largely paper-based, it is proposed that a recognised verifier must be either a chartered accountant or chartered professional engineer, with five years' post-qualification work experience in accounting or engineering. These provisions are intended to provide both robustness of verification and a pool of verifiers who can be used by applicants seeking approval for a UEF. It is not proposed to charge a fee for applications to become a recognised verifier.

Comments on the proposed verification regime, including the qualification and experience requirements of verifiers, are welcomed. Particularly sought are comments about whether additional or specified qualifications would be necessary to meet the verification requirements for particular sectors.

Draft Climate Change (Other Removals Activities) Regulations 2009

Introduction

The draft removal regulations have been developed to provide for activities covered by Schedule 4, Part 2, Subpart 1 of the Climate Change Response Act 2002 (the Act). This part of the Act relates to

producing a product that embeds a substance which would otherwise result in emissions.

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 for which New Zealand pays a cost. Upstream points of obligation in the NZ ETS increase the price of fossil fuels in the stationary energy and liquid fossil fuels sectors. This is because fuel is assumed to be combusted, resulting in emissions. However, emissions do not result from fossil fuel carbon which is instead embedded in a product.

The criteria for eligibility to register as a participant for removal activities are set out in Schedule 4, Part 2, Subpart 1 of the Act. Significantly, removals embedded in a product must be recognised in New Zealand's Greenhouse Gas Inventory. Currently only two activities satisfy these criteria – methanol production and steel production. Other activities which embed emissions, such as urea production and CO_2 used in glasshouses, are not eligible activities because these activities are not recognised in the 1996 IPCC Guidelines for National Greenhouse Gas Inventories with which New Zealand's Greenhouse Gas Inventory must comply.[5]

Thresholds

The draft removal regulations prescribe a threshold of 5000 tCO_2-e for eligibility to register as a participant. This threshold reflects the costs associated with providing for a removal activity. These include costs from determining sufficient data collection requirements and calculation methods, promulgating regulations, data collection, filing emissions returns for removals, risk management and compliance, and transferring emission units for removals. Removal activities falling below this threshold would result in only a minor economic benefit from transferring a small number of emission units from the Crown to a person. Additionally, the proposed threshold is consistent with the threshold set in the Act for mandatory registration as a participant for mining coal.

Currently, the quantity of removals from steel production is significantly less than the proposed threshold. Therefore, the draft regulations do not prescribe data collection requirements and calculation methods for removals from steel production, and the SEIP regulations do not allow for the deduction of carbon embedded in steel.

The quantity of removals from methanol production does cross this threshold and a process for data collection and removals calculation for this activity is outlined in the draft removals regulations. It is possible that further activities will satisfy the eligibility criteria, including the threshold. If this occurs, the regulations will be amended to provide data collection requirements and calculation methods as appropriate.

Climate Change (Liquid Fossil Fuels) Amendment Regulations 2009

The draft liquid fossil fuel (LFF) amendment regulations have been developed to enable the use of unique emissions factors for participants in this sector. The amendments are largely of a technical nature. The detail of the process by which LFF participants may apply for approval to use a UEF is addressed in the draft UEF regulations.

[5] Revised 1996 IPCC *Guidelines for National Greenhouse Gas Inventories*, Vol 3, 2.14–2.16 and Chapter 5 (specifically 5.17).

Process for submissions

Submissions on the package of draft regulations and issues outlined in this bulletin are welcomed by 5pm on 30 June 2009. Submissions, together with further engagement with stakeholders, will inform any further changes to regulations to be made before 1 October 2009 when regulations are due to be finalised.

Submissions can be made as follows:

- by email: emissionstrading@climatechange.govt.nz
- by post: Ministry for the Environment, PO Box 10362, Wellington 6143

Draft regulations can be viewed by visiting www.climatechange.govt.nz.

All the material proposed to be incorporated by reference, is available for inspection free of charge on week days between 9am and 5pm from 3 June 2009 to 30 June 2009 at:

- the Ministry of Economic Development's head office at Ground Floor, 33 Bowen St, **Wellington**, phone (04) 472 0030
- the Government Urban and Economic Development Office at Level 6, Tower Centre, 45 Queen Street, **Auckland**, phone (09) 985 4800
- the Companies Office at the Southern Business Centre, 55 Wordsworth Street, Sydenham, **Christchurch**, phone (03) 962 2600.

All materials may be bought directly from Standards New Zealand, Radio New Zealand House, Level 10, 155 The Terrace, Private Bag 2439, Wellington or online at www.standards.co.nz.

As at the date of this bulletin, the Aluminium Sector Greenhouse Gas Protocol is available online free of charge at www.world-aluminium.org and the USEPA standards references are also available online free of charge at www.epa.gov.

Further engagement

Further work will be undertaken on thresholds and exemptions under section 60 of the Act. Officials will engage with companies in the refining, coal, geothermal and waste sectors to conduct targeted consultation on these exemption and threshold proposals.

Application and emissions return forms and supporting guidance materials are also being developed to help participants meet their obligations under the NZ ETS. This includes the standards and guidelines on measurement referred to above.

Officials welcome the involvement of participants in the development of these standards and guidance materials. At its first meeting in late May, the SEIP Implementation Technical Advisory Group provided guidance on the structure and content of a series of industry-specific workshops to test and refine application and registration processes and requirements for data collection and emissions reporting. These workshops will be held in late June and early July.

For more information, or if you are interested in participating, contact Katherine Wilson on katherine.wilson@mfe.govt.nz or (04) 439 7578.

For further information about any of the three draft regulations, or about stationary energy and industrial processes participants under the NZ ETS, refer to the *Framework for a New Zealand Emissions Trading Scheme* at www.climatechange.govt.nz or call 0800 CLIMATE (0800 254 628) or send an email to emissionstrading@climatechange.govt.nz.

Disclaimer
Submitters should be aware that all submissions will be made publicly available on this website. People are able to provide material to officials marked "Commercial: In Confidence" which will not be published on this website. However, any such material remains subject to the Official Information Act. The OIA sets out the thresholds for withholding commercially sensitive information but also requires any particular public interest in the information to be taken into account by officials making decisions on OIA requests.

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INFO 408

Appendix 1: Emission factors for stationary energy

Table 1 – Importing Coal

Emissions Source		Emissions Factor tCO_2-e/TJ			Total	Default Emissions Factor
	Oxidation Factor	CO_2 (GWP=1)	CH_4 (GWP=21)	N_2O (GWP=310)	tCO_2-e/TJ	tCO_2-e/TJ
Lignite	0.980	96.09	0.0147	0.465	94.65	95.03
Sub-bituminous	0.980	91.99	0.0147	0.465	90.63	90.78
Bituminous	0.980	89.13	0.0147	0.465	87.83	88.28

Table 2 – Mining Coal

Emissions Source		Emissions Factor tCO2-e/TJ			Total	Default Emissions Factor
	Oxidation Factor	CO_2 (GWP=1)	CH_4 (GWP=21)	N_2O (GWP=310)	tCO_2-e/TJ	tCO_2-e/TJ
Lignite – Waimumu and Roxburgh	0.980	93.11	0.0147	0.465	91.73	91.73
Lignite	0.980	96.09	0.0147	0.465	94.65	95.03
Sub-bituminous	0.980	91.99	0.0147	0.465	90.63	90.78
Bituminous	0.980	89.13	0.0147	0.465	87.83	88.28

This table shows the mean of the assumed distribution for different classes of coal and the DEF. See Appendix 4 for more details on how the DEF has been set.

Table 3A – Fugitive Coal Seam Gas

Emission Source Category	Emissions Source	Emissions Factor tCO_2-e/t coal				Total
		Oxidation Factor (CO_2 only)	CO_2 (GWP=1)	CH_4 (GWP=21)	N_2O (GWP=310)	tCO_2-e/t
Fugitive emissions	Surface mining (including post-mining)	NA	-	0.000837	-	0.018
	Underground bituminous mining (including post-mining)	NA	-	0.018350	-	0.385
	Underground sub-bituminous mining (including post-mining)	NA	-	0.013700	-	0.288

Table 3B – Combusting Coal Seam Gas

Emission Source Category	Emissions Source	Emissions Factor tCO_2-e/t gas				Total
		Combustion Efficiency	CO_2 (GWP=1)	CH_4 (GWP=21)	N_2O (GWP=310)	tCO_2-e/t
Fugitive emissions	Difference between flaring and venting (ie, the reduction in GWP)	NA	NA	NA	NA	17.885

Table 4 – Importing Natural Gas

Emission Source Category	Emissions Source	Emissions Factor tCO_2-e/GJ				Total
		Oxidation Factor (CO_2 only)	CO_2 (GWP=1)	CH_4 (GWP=21)	N_2O (GWP=310)	tCO2-e/GJ
Natural gas	Commercial propane	0.995	0.05960000	0.00002195	0.00017670	0.05950065
	Commercial butane	0.995	0.06140000	0.00002195	0.00017670	0.06129165
	LPG (P60:B40)	0.995	0.06040000	0.00002195	0.00017670	0.06029665

Table 5 – Mining or Purchasing Natural Gas

Emission Source Category	Emissions Source		Emissions Factor tCO_2-e/TJ			Total
		Oxidation Factor (CO_2 only)	CO_2 (GWP=1)	CH_4 (GWP=21)	N_2O (GWP=310)	tCO2-e/TJ
Natural gas	National average (specification gas)	0.995	53.29	0.0013	0.0001	53.35

Table 6A – Using Geothermal Steam

Emission Source Category	Emissions Source		Emissions Factor tCO_2-e/t steam			Total tCO_2-e/t steam
		Oxidation Factor (CO_2 only)	CO_2 (GWP=1)	CH4 (GWP=21)		
Geothermal	Wairakei A, B and Binary Power Plants	NA	NA	NA	-	*0.00547**
	Poihipi Road Geothermal Plant	NA	NA	NA	-	*0.00432**
	Ohaaki Power Plant	NA	NA	NA	-	*0.04187**
	Mokai I & II Power Plants	NA	NA	NA	-	0.0069
	Mokai Greenhouse	NA	NA	NA	-	0.00
	Rotokawa I Power Plant	NA	NA	NA	-	0.0214
	Kawerau Industrial Use	NA	NA	NA	-	*0.1024**
	Kawerau II Power Plant	NA	NA	NA	-	0.0275
	Kawerau KA24 Power Plant	NA	NA	NA	-	*0.1024**
	Ngawha I & II Power Plants	NA	NA	NA	-	0.212
	Any other plant or process using geothermal steam to produce electricity or industrial heat	NA	NA	NA	-	0.212

* = *field data in the absence of plant-specific data*

Table 6B – Using Geothermal Fluid

Emission Source Category	Emissions Source	Oxidation Factor (CO_2 only)	Emissions Factor tCO_2-e/t steam CO_2 (GWP=1)	CH4 (GWP=21)		Total tCO_2-e/t 2-phase fluid
Geothermal	Tenon industrial use of Tauhara field	NA	NA	NA	-	*0.00547**
	Any other plant or process using geothermal fluid to produce electricity or industrial heat other than production of geothermal steam	NA	NA	NA	-	0.00547

** = field data in the absence of plant-specific data*

Table 7 – Combustion of Used Oil, Waste Oil, Used Tyres or Waste

Part A - Used Oil and Waste Oil

Emission Source Category	Emissions Source	Oxidation Factor (CO_2 only)	Emissions Factor tCO_2-e/TJ waste CO_2 (GWP=1)	Total CH_4 (GWP=21)	N_2O (GWP=310)	tCO_2-e/TJ
Used and waste oil		1.000	69.60	0.63	1.24	71.47

Part B – Used Tyres

Emission Source Category	Emissions Source	Oxidation Factor (CO_2 only)	Emissions Factor tCO_2-e/TJ waste CO_2 (GWP=1)	CH_4 (GWP=21)	N_2O (GWP=310)	Total tCO_2-e/TJ
Used tyres		1.000	136.00	0.63	1.24	137.87

Part C – Waste

Emission Source Category	Emissions Source		Emissions Factor tCO_2-e/TJ waste	Total		
		Oxidation Factor (CO_2 only)	CO_2 (GWP=1)	CH_4 (GWP=21)	N_2O (GWP=310)	tCO_2-e/TJ
Waste	Municipal waste - biomass fraction	1.000	0.00	0.63	1.24	1.87
	Municipal waste - non-biomass fraction	1.000	115.00	0.63	1.24	116.87
	Solid biofuels - wood and wood waste	1.000	0.00	0.63	1.24	1.87
	Solid biofuels - sulphate lyes	1.000	0.00	0.63	0.62	1.25
	Solid biofuels - charcoal	1.000	0.00	4.20	1.24	5.44
	Solid biofuels - other (not wood or wood waste or sulphate lyes or charcoal)	1.000	0.00	0.63	1.24	1.87

Appendix 2: Emission factors for industrial processes

Table 1 – Producing Iron or Steel

		Emission Factor (tonne/tonne)				Total
Emission Source Category	**Emission Source by activity**	**Oxidation Factor (CO_2 only)**	**CO_2 (GWP=1)**	**CH_4 (GWP=21)**	**N_2O (GWP=310)**	**tCO_2-e/t**
Producing iron or steel	Mass reducing agents	NA	3.67	NA	NA	3.67
	Uncalcined limestone	NA	0.44	NA	NA	0.44
	Uncalcined dolomitic limestone	NA	0.48	NA	NA	0.48
	Carbon inputs	NA	3.67	NA	NA	3.67

Table 2 – Producing Aluminium

		Emission Factor (tonne/tonne)				Total
Emission Source Category	**Emission Source by activity**	**Oxidation Factor (CO_2 only)**	**CO_2 (GWP=1)**	**CH_4 (GWP=21)**	**N_2O (GWP=310)**	**tCO_2-e/t**
Producing aluminium	Consumption of anodes	NA	3.67	NA	NA	3.67

Table 3 – Producing Clinker or Burnt Lime

		Emission Factor (tonne/tonne)				Total
Emission Source Category	**Emission Source by activity**	**Oxidation Factor (CO_2 only)**	**CO_2 (GWP=1)**	**CH_4 (GWP=21)**	**N_2O (GWP=310)**	**tCO_2-e/t**
Producing clinker	Production of clinker	NA	0.54	NA	NA	0.54
Producing burnt lime	Production of burnt lime	NA	0.79	NA	NA	0.79
	Production of burnt dolomite	NA	0.91	NA	NA	0.91

Table 4 – Producing Glass

		Emission Factor (tonne/tonne)				Total
Emission Source Category	**Emission Source by activity**	**Oxidation Factor (CO_2 only)**	**CO_2 (GWP=1)**	**CH_4 (GWP=21)**	**N_2O (GWP=310)**	**tCO_2-e/t**
Producing glass						
	Soda ash	NA	0.42	NA	NA	0.42
	Uncalcined limestone	NA	0.44	NA	NA	0.44
	Uncalcined dolomite	NA	0.48	NA	NA	0.48

Table 5 – Producing Gold

Emission Source Category	Emission Source by activity	Emission Factor (tonne/tonne) Oxidation Factor (CO_2 only)	CO_2 (GWP=1)	CH_4 (GWP=21)	N_2O (GWP=310)	Total tCO_2-e/t
Producing gold						
	Uncalcined limestone	NA	0.44	NA	NA	0.44
	Uncalcined dolomite	NA	0.48	NA	NA	0.48

Table 6 – Producing Cable

Emission Source Category	Emission Factor (tonne/tonne) Oxidation Factor (CO_2 only)	CO_2 (GWP=1)	CH_4 (GWP=21)	N_2O (GWP=310)	Total tCO_2-e/t
Using the nitrogen cure process	N/A	N/A	N/A	486.7	486.7

Appendix 3 – Data and calculations for removals from methanol production formula

Data
Calculations are based on specification natural gas, which has the properties outlined in Table 5 of Appendix 1.

- Oxidation factor – 0.995
- Emissions factor for CO_2 only (based on complete oxidation) – 0.05355779 tCO_2-e/GJ
- Emissions factor CH_4 – 0.0000273 tCO_2-e/GJ
- Emissions factor for N_2O – 0.000031 tCO_2-e/GJ
- Total emissions factor – 0.05335 tCO_2-e/GJ

Methanol is 37.5% carbon by weight.

Calculations

1. The quantity of removals is determined by the number of gigajoules (GJ) of specification natural gas used, multiplied by the total emissions factor for specification natural gas:

   Removals (tCO_2-e) = GJ Gas x EF

2. The number of GJ of specification natural gas used is determined by the quantity of carbon in methanol (t), multiplied by the number of GJ per tonne of carbon in specification natural gas:

   GJ Gas = Carbon in Methanol (t) x GJ / Carbon in Gas (t)

3. The quantity of carbon in methanol is determined by the quantity of methanol, multiplied by 0.375:

   Carbon in Methanol (t) = Methanol (t) x 0.375

4. The number of GJ per tonne of carbon in specification natural gas is determined by dividing 1 GJ of specification natural gas by the quantity of carbon in 1 GJ of specification natural gas (t).

   GJ / Carbon in Gas (t) = 1 / Carbon in 1 GJ Gas

5. The quantity of carbon in 1 GJ of specification natural gas is determined by the emissions factor for CO_2 only (based on complete oxidation) for specification natural gas, multiplied by the proportion of carbon in CO_2:

   Carbon in 1 GJ Gas = EF (CO_2 only) x Carbon in CO_2
   = 0.05355779 x 12/44
   = 0.01460667

6. Therefore, the number of GJ per tonne of carbon in specification natural gas:

   GJ Gas / Carbon in Gas (t) = 1 / 0.01460667
   = 68.4618739247

7. Therefore, the number of GJ of specification natural gas used:

GJ Gas	=	Carbon in Methanol (t) x GJ Gas / Carbon in Gas (t)
	=	Methanol (t) x 0.375 x 68.4618739247
	=	Methanol (t) x 25.6732027217

8. Therefore, the quantity of removals (tCO_2-e):

Removals (tCO_2-e)	=	GJ Gas x EF
	=	Methanol (t) x 25.6732027217 x 0.05335
	=	Methanol (t) x 1.3696653652
	=	Methanol (t) x 1.37 (rounded)

Appendix 4: Background to the coal sector DEF recommendations

Table 2 of Appendix 1 represents the mean of the assumed distributions for different classes of coal that are the foundation of the default emission factors (DEF) included in the draft regulations. The CO_2-only emission factors have been provided by an independent specialist, while CH_4 and N_2O emission factors and the oxidation factor are in turn based on the revised IPCC 1996 inventory guidelines used for the New Zealand Greenhouse Gas Inventory. The independent report also included information on the uncertainties associated with the CO_2 component of these emission factors, and the uncertainties likely to be associated with coals tested according to the standards specified in the UEF regulations.

Two key principles underpin the proposed DEFs and materiality threshold for UEF applications:

- delivering an overall unbiased model relative to a situation where no UEF opportunity existed and the DEF was set at the distribution mean (the adverse selection problem)
- ensuring UEFs actually are significantly different from the DEF (arises from sample and testing variability).

Both these issues can be managed by setting the DEF at about 0.35-0.40 standard deviations (about the 65th percentile) above the mean along with a materiality exclusion of just under one standard deviation below the DEF. Clearly various combinations of the two control variables could be applied to deliver an overall non-biased outcome. Feedback on this is welcomed.

DEF and Materiality Threshold for UEF applications

Emission Source Category	Emissions Source	Default Emissions Factor tCO_2-e/GJ	Materiality Exclusion Threshold tCO_2-e/GJ
Coal	Lignite – Waimumu and Roxburgh	0.0917	0.0908
	Lignite – All Other	0.095	0.0941
	Sub-bituminous	0.0908	0.0904
	Bituminous (for NZ use)	0.0883	0.0871