

Subject : **Climate Change (Stationary Energy and Industrial Processes) Regulations 2009; Climate Change (Unique Emissions Factors) Regulations 2009:
Drafts for Consultation**

Submission To: **Ministry for the Environment**
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1 Introduction

Holcim (New Zealand) Limited (Holcim) once again welcomes the opportunity to make a formal submission on the draft regulations underpinning the Climate Change Response Act 2002.

Holcim remains acutely dissatisfied with both the process that culminated in the Act, and in the actual content of the Act itself. It is a matter of deep regret that the rushed process of crafting the Act ultimately, and inevitably, contributed to a deeply flawed legislative outcome. It is to be hoped that the deliberations of the Select Committee tasked with reviewing the Act will lead to the large-scale modifications necessary to ensure a workable climate change policy outcome for New Zealand.

In the matter of the draft Regulations with which this submission is concerned, we commend the drafters for recognising the serious shortcomings that were a feature of the first set of draft regulations, and for addressing many (though, by no means, all) of the concerns raised by Holcim in its previous submission (December 2008). We do retain serious concerns with the validity of some of the detailed assumptions underpinning key parts of these draft regulations.

Holcim's interest in these draft regulations arises chiefly from its conduct of business activities that are energy intensive and that release carbon dioxide as an industrial process emission. These are:

- Cement manufacture (Westport Works);
- Lime manufacture (McDonald's Lime and Taylor's Lime in the Otorohanga/Te Kuiti and Dunedin areas respectively).

In view of the complex nature of some the points raised, we would welcome the opportunity to assist or further consult with officials in correcting some of the oversights we have identified.

2 Specific Submission Points

Holcim's specific submission points are presented in this section.

Comments are made on two sets of draft regulations: Climate Change (Stationary Energy and Industrial Processes) Regulations 2009; Climate Change (Unique Emissions Factors) Regulations 2009.

For brevity, in the text these drafts are identified by the acronyms *SEIP* and *UEF*, respectively.

Frilled brackets { } are used to identify relevant clause or paragraphs of the relevant draft regulations. Where required, square brackets [] are used to identify the relevant paragraph number of the Act.

SEIP, UEF. Consultation, See also Act [166]

We acknowledge that the drafts now no longer state that there is a compulsory consultation process in place in the event that changes are deemed necessary to these regulations. This is at least consistent with the Act [166(4)] which circumvents any need for consultation by permitting regulations made under sections [163, 164, and 165] to be changed *without consultation*.

As the subject matter of sections [163, 164, and 165] is substantially the subject matter of the draft regulations upon which we are submitting here, it seems to us that [166(4)] undermines the credibility of these draft regulations and permits material changes to any or all regulations at the *sole discretion* of the regulator. In short, [166(4)] has the effect of permitting unilateral introduction or amendment of such regulations without the necessity to consult with affected parties.

We cannot see how such arbitrary powers add certainty or confidence for participants in a future NZ ETS. Particularly in the early stages of the NZ ETS, where there will certainly be an element of "learning by doing", it would seem constructive to explicitly permit a process where the regulator and participants can co-operate to make sensible changes that may be required to ensure equity and robustness.

Whilst the Act is now in force and [166(4)] may be difficult to change, we strongly suggest that the regulations explicitly define a consultation process by which material changes can be made to the operation of the regulations.

SEIP {20, 21, 22} Combusting used oil, waste oil, used tyres, or waste

As noted in our previous submission on the previous draft regulations, there is an argument that measurement of emissions from *all* waste materials can be treated by a *single* approach – and we note that this has been attempted in this current draft.

However, we suggest that the attempt is incomplete.

By way of explanation: irrespective of type, all wastes may be composed of

- a) A combustible fraction, composed of non-renewable fuel
- b) A combustible fraction, composed of biogenic (biomass) fuel
- c) A non-combustible fraction

Any waste must be analysed for *each* of these fractions, and *only* the proportion that is composed of non-renewable fuel should be assessed for the purposes of liability under the regulations.

For example, in New Zealand, car tyres typically consist of:

1. 15% by weight steel (non-combustible)
2. 25% natural rubber (biomass)
3. 60% synthetic rubber (non-renewable)

The composition of truck tyres is different – with a *higher* natural rubber content.

The assessment for other types of waste is identical to that outlined above. We suggest that many other wastes also contain biomass to greater or lesser degrees. As an example, at the extreme end, it is possible to argue that waste paper is substantially *all* biomass (excluding the non-combustible silica ash). And, other waste materials will contain negligible or no biomass content (used oil, many plastics).

We very much welcome the treatment of the issue of biogenic material (biomass) in these regulations (UEF). We suggest only that there is still an opportunity to generalise the treatment of all wastes using a common and simplifying approach – rather than seeking to prescribe approaches for individual waste types.

“4.1 Fuel categories for biomass and waste fuels

The problem of fuel category definitions is most pronounced for waste fuel and biomass fuels where categories used by countries vary largely.

E.g for biomass fuels current reporting includes categories such as fuelwood, bark, wood chips, sawdust, other residues from wood production, malodorous gases from wood production industry, 0-fibres / biosludge, waste paper, poultry litter, meat and bone meal, straw etc. Waste categories can for example include municipal waste, construction & demolition waste, industrial waste, plastic waste, scrap tyres, landfill gas, sewage gas, waste oils, other wastes etc.

The biomass parts of wastes are considered as carbon-neutral and an emission factor of 0 is used in international reporting under the UNFCCC and the Kyoto Protocol. However, for the fossil fractions emissions have to be calculated. The key problem for waste fuels is the determination of the biogenic and fossil fractions of wastes and the related emission factors of the fossil parts as waste fuels are not standardized and could vary considerably with regard to different suppliers or over time. In certain industries, e.g. cement industry large amounts of waste fuels are used, and practical guidance is necessary how emissions from waste fuels should be determined, in particular how fossil fractions and corresponding emission factors are determined.

In this area frequently also information available at country-level is insufficient and uncertainties in energy balances and greenhouse gas inventories can be considerable because data on the consumption of waste fuels is not always available or reliable and the information on biogenic and fossil fractions could be based on expert judgement.

Different approaches are possible. E.g. guidelines could strictly require that for non-standardized fossil fuels, each installation is responsible for a reliable measurement of fossil fractions and emission factors. This would also require to establish methods for both areas that are considered as reliable and to establish required documentation for such cases (e.g. how often have fractions to be determined, how many samples are necessary etc.).

If the monitoring of composition of waste fuels with regard to biogenic and fossil carbon fractions is considered as too resource-demanding or if the biogenic fraction is very low, a conservative approach should be used, e.g. assuming 100% of fossil carbon for wastes when the composition is not determined. For important waste fuels - such as tyres or plastics - used in the energy or industry sector, this conservative assumption is a rather valid assumption. This would require establishment of additional default emission factors for these fuel types in some countries where such factors do not yet exist. This work should preferably be performed in each country as only this level allows the setting of default values for the relevant waste fuel types.”

“Comparison of CO₂ emission factors for fuels used in Greenhouse Gas Inventories and consequences for monitoring and reporting under the EC emissions trading scheme”, Anke Herold, European Topic Centre on Air and Climate Change, ETC/ACC Technical Paper 2003/10, July 2003.

SEIP {8, 9, 10} Mining Coal

Whilst Holcim New Zealand is not a coal miner, we do purchase substantial quantities of coal annually – though not enough to qualify for opt-in.

However, we are concerned that SEIP{10(2)} presumes an ability to accurately measure emissions of coal-seam methane associated with mining coal.

We are unaware that any such capability currently exists in the New Zealand coal mining industry.

We understand that the quoted emission factors for coal seam methane, quoted in SEIP {Part A, Table 3, Schedule 2}, originate from IPCC. And, we suspect these will be justifiably contested by the coal mining industry.

However, as a price-taker in the coal market, we will pay for the estimated coal seam methane cost, as part of the purchase cost of coal. Until reliable data exists to underpin

such costs, we have absolutely no cost certainty for a major component of our business – other than that we will probably pay too much.

We strongly suggest that the regulations do not attempt to ‘capture’ coal seam methane emissions as part of coal mining until such time as there is absolute clarity on both the materiality and the accuracy of measure for each domestic coal type available.

SEIP {32, 33, 34} Producing clinker or burnt lime

Broadly, we applaud the methodology employed in these draft regulations to calculate emissions from clinker and lime. The use of CaO content as a proxy for CO₂ emissions is clever and coherent.

We suggest some important amendments, however.

In SEIP {34(1)}, the variable ‘A’ is the total number of tonnes of cement clinker produced by the person in the year expressed in tonnes of CaO. This definition assumes that *all* the measured CaO has arisen from calcination (decarbonation) of CaCO₃.

This assumption is incorrect.

It fails to account for cases where *non-carbonaceous or partially-calcined* CaO is added to the raw materials input. Thus, limestone (CaCO₃) may be replaced by addition of alternative raw materials that consist of material fractions of non-carbonated Ca or CaO compounds. As a simple example, waste cement, which (by definition) consists of non-carbonated calcium silicates, can be recycled back through a kiln to produce fresh clinker of normal composition (normal CaO content). In this way, a waste material is productively recycled, the consumption of non-renewable limestone is reduced, and CO₂ emissions are reduced – yet the measured CaO content of the clinker is unchanged.

We suggest that this is precisely the sort of behaviour that should be *encouraged* by the regulations. As it stands, the definition of ‘A’ *discourages* such behaviours.

We recommend that the definition of variable ‘A’ be changed to:

“A is the total number of tonnes of cement clinker produced by the person in the year, as recorded under Section 33(a), expressed in tonnes of calcined CaO.”

We acknowledge also the attempt to capture the issue of cement kiln dust (CKD) production as a by-product of the wet-kiln process (as employed at Holcim’s Westport Works).

However, the approach employed in SEIP {34(1)} is unacceptably restrictive and potentially incorrect. It assumes that the proportion of CKD produced is invariant (namely, that CKD emissions are always an additional 2% of total process emissions). It makes the assumption that all kilns have identical CKD production rates – which is patently untrue. CKD production is particularly dependant on the chemistry of the raw materials inputs, and on the process technology employed.

We recommend that the definition of variable ‘B’ be changed to:

“A is the cement kiln dust correction factor from Table 2 in Schedule 3.

Or

A is the cement kiln dust correction factor calculated from direct measurements, in accordance with an internationally-recognised industry standard.”

We suggest that the “*internationally-recognised industry standard*” should be Appendix 4 of “The Cement CO₂ Protocol (v2.0, WBCSD-CSI, June 2005)”.

In SEIP {34(1)}, the variable ‘C’ is the total number of tonnes of lime produced by the person in the year. This definition omits to define the term “lime”. But, we note that the supporting workbook (Beca, May 2009) assumes correctly that “*lime*” is calculated by normalising actual production to 100% purity (100% pure CaO). This definition needs to be included in the regulations.

The formula for lime emissions should be amended to include a “purity” factor to ensure accuracy. Thus, the existing formula at SEIP {34(1)}

$$E = \dots \Sigma(C \times EF_2)$$

should be altered to

$$E = \dots \Sigma(C \times \rho \times EF_2), \text{ where } \rho \text{ is the \% CaO content of the lime.}$$

The draft regulations assess the liability of lime manufacturing solely on the basis of the CaO content of the finished product. The approach is valid in principle, but is invalid in detail.

Industrial lime is frequently and widely employed for water treatment and other purposes where it can, and does, substantially recarbonate. Indeed, this phenomenon is so widely established that the precipitation of recarbonated CaCO₃ in certain processes requires careful management to keep reaction vessels operational (the same phenomenon is known as “furring” in domestic kettles and water heaters).

In summary, where lime extracts CO₂ from certain downstream processes, assessment of the manufacturing emissions solely on the basis CaO content overstates the net emissions liability of the lime manufacturer.

It is highly likely that this CO₂ ‘removal’ characteristic of lime is material, albeit dependant on the application; and we suggest that the option to follow the relevant IPCC Guidelines be given in order to assess the net liability of the manufacturer.

The consumption of lime as a product may in some cases *not result in net emissions* of CO₂ to the atmosphere. The use of hydrated lime for water softening, for example, results in CO₂ reacting with lime to re-form calcium carbonate, resulting in no net emissions of CO₂ to the atmosphere. Similarly, precipitated calcium carbonate, which is used in the paper industry as well as for other industrial applications, is a product derived from reacting hydrated high-calcium quicklime with CO₂. During the process of sugar refining, lime is used to remove impurities from the raw cane juice; any excess lime can be removed through carbonation. Any recarbonation in these specific industries may be calculated and reported only where proven and validated methods are used to calculate the amount of CO₂ that reacts with lime to re-form calcium carbonate. Where these conditions are met, this may be reported under Category 2H, Other.

“Guidelines for National Greenhouse Gas Inventories, Volume 3, Industrial Processes and Product Use: Mineral Industry Emissions”, IPCC 2006, Section 2.3.1, p.2.19.

UEF

We commend the decision to deal with the matter of unique emissions factors as an important regulatory factor.

UEF {6}

There is no definition of the term “waste”. This is entirely desirable.

But, if it is intended that the term capture as wide a range of waste materials as possible, then perhaps the *separate* definition of “waste oil” and “used tyres” seems redundant. This is possibly a small matter.

UEF {15(2), Table 3 of Schedule}

We are pleased that it is possible to apply for a unique emissions factor (UEF) for combustion of wastes.

We are *absolutely* opposed to the magnitude of the “divergence” thresholds set at Table 3 of the Schedule. For the example of wood waste:

Default emissions factor (DEF):	1.87tCO ₂ e/TJ		
UEF Threshold:	<u>0.83tCO₂e/TJ</u>		
Divergence:	-1.04CO ₂ e/TJ	or	-55.6%

In short, an application for a UEF for wood waste can *only* succeed if the measured UEF is *less than half* the DEF. This example is by no means unique.

This is an extraordinary imposition on businesses that are, presumably, attempting to reduce their emissions. Let us recall that it is surely the objective of the Act to provide clear signals to businesses that emissions reductions are necessary or even compulsory.

The setting of *any* divergence threshold is entirely counter-productive. It signals to business that it is simply “too hard” to qualify for a UEF, therefore it is too hard to engage in exactly those reduction activities that are the objective at the heart of the Act. We suggest that the regulations should be signalling to business that emissions reductions initiatives are desirable – and are encouraged – not discouraged. How else are we to change behaviours?

We are entirely unconvinced by the argument that:

“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.”

Emissions Trading Bulletin, No 10, June 2009

We struggle to understand how the fiscal position of the Crown can be affected by having *more* accurate national emissions inventory data – particularly if the liability is actually reduced by means of more precise and traceable measurement.

The argument that smaller participants will somehow be disadvantaged is unequivocally nonsense. Our long and bitter experience of the operation of the RMA and related environmental or hazard legislation in New Zealand is that so-called “small participants” in the waste market mercilessly exploit every loophole to avoid even the most negligible environmental obligations. By avoiding their obligation, they force the entire market to lowest common denominator practices – effectively entrenching ‘lowest cost’ solutions at the expense of best practice environmental solutions.

A divergence threshold has the effect of:

- a) Penalising participants by forcing them to pay for more emissions than they actually emit;
- b) Discouraging take-up by participants of large volumes of waste materials that might usefully be employed to reduce emissions; and
- c) Increasing the flow of waste materials into the environment;
- d) Encouraging *and subsidising* the illegal or unethical activities of small operators who are not participants

The UEF divergence threshold must be removed, in toto.

Application for a UEF must be freely available to all participants. It is up to the participant to convincingly prove that actual emissions are lower than the DEF.

UEF {17(1)(a)}

It is not clear what procedures (CEN, ASTM, ISO) are to be used for wastes that are not either solid fuels or used or waste oil.

For example, solvent fuels are liquid wastes that are not waste or used oil. What standards should be applied in analysing solvent fuels?

Perhaps UEF {17} is overly prescriptive. It should be possible to amend the wording so that it is more general (and inclusive) in nature.

The wording of UEF {17(1)(a)} should be amended to ensure that it is more broadly applicable to a range of waste types.

UEF {17(1)(b)(i)(C)}

There appears to be an inadvertent error of omission in the wording of this clause.

We presume the wording should read:

“determination of biomass (or, biogenic) content as a percentage...”

UEF {17(1)(b)(ii)}

There appears to be an inadvertent error of omission in this clause.

There is no clause (C) for used or waste oil, as there is for solid fuels in the previous UEF {17(1)(b)(i)(C)}. The missing clause (C) would cover biomass determination in oils, and would be set out as paragraph {17(1)(b)(ii)(C)} .

UEF {17(1)(c)}

By referencing only paragraph UEF {17(1)(b)(i)(C)}, the definition of F is limited solely to solid fuels.

We suggest that the definition of F must also reference liquid fuels – per the proposed (above) paragraph {17(1)(b)(ii)(C)} .

UEF {17(1)(d)}

As described in a prior submission, we note that actual value assigned to many of the emissions factors is critically *process-dependant*. Thus, we would contend that high temperature combustion (energy recovery at > 1,500deg C) of used oil in a cement kiln produces zero CH₄ at all times. The temperatures involved make the emission of methane effectively impossible. There is no literature of which we are aware that identifies methane in kiln exit gases.

Likewise, we are unaware of any evidence in any international literature or in any of the extensive testing performed by Holcim (New Zealand) Ltd that identifies N₂O in kiln exit gases, irrespective of waste combustion.

On the other hand, we would agree that low temperature combustion (<1,000deg C) may very well lead to such emissions.

Such considerations need to be applied to partial and full emissions factors for all other types of wastes – at least as far as those wastes are combusted in cement kilns.

UEF {17(2)}

This clause defines conditions under which selective dissolution (CEN/TS 15440:2006) *cannot* be used.

It is not made clear what alternative must be employed if the pre-conditions for employing selective dissolution are not met. For example, if scrap tyres are to be used, what is the alternative proposed? Is it acceptable to employ ASTM D6866-8?

Is it acceptable to use ASTM D6866-8 as an alternative in all cases for CEN/TS 15440:2006?

Concluding Remarks

As always, Holcim (New Zealand) Ltd welcomes any opportunity to assist or consult with officials in the drafting or amending of these other regulations.