

**CLIMATE CHANGE (STATIONARY ENERGY AND INDUSTRIAL PROCESSES)
REGULATIONS 2008**

Submission to: Ministry for the Environment
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1 Introduction

- 1.1 Solid Energy is New Zealand's largest energy producer, including coal, renewables (biofuels, biomass and solar) and new energy developments, and is one of New Zealand's major exporters. We are also a major energy user, primarily of transport fuels and electricity, in our production and distribution operations. We are directly responsible through our own and our contractors' staff for close to 2,000 direct jobs, and we support around 10,000 indirect jobs through our suppliers and communities.
- 1.2 We have thousands of customers, ranging from New Zealand's largest companies to many small industrial and commercial businesses as well as hospitals, universities, schools and municipalities, and households through our Nature's Flame wood pellet and Switch pellet and solar appliance subsidiaries. Supplying secure affordable energy to these customers makes a significant contribution to New Zealand's economic competitiveness and our climate change obligations. Our international activities involve regular work on market, technical and policy matters at a senior level with industry and government in the EU, North and South America, South Africa, India, China and Australia.

2 Overall Framework of Climate Change Response Act 2002 ("Act"); proposed regulations and Government Review of ETS

- 2.1 We are being asked to comment on regulations intended to form part of the proposed emissions trading scheme ("ETS") as enacted by the Climate Change Response Amendment Act 2008. That amending Act was passed with undue haste and was subject to so many last minute and significant changes that the ETS as enacted cannot in fact operate according to its terms.
- 2.2 In particular there is material uncertainty for participants around unit eligibility or future allocation; consultation processes that can be overruled or ignored; and major uncertainties around opt-in.

- 2.3 In addition the Act itself is opaque with so many cross-references required it is hard for any user of it to fully understand their obligations.
- 2.4 There are also issues around the announced government review of the ETS and proceeding with regulations under an enactment that may well be changed in the very near future.

3 SEIP Regulations – Flawed Consultation Process

- 3.1 The Act requires under section 166 that before making a recommendation for the making of regulations under section 166 the Minister (or CEO) must consult with persons likely to be substantially affected by any such regulation.

- 3.2 The process for consultation must include:

- “(a) giving adequate and appropriate notice of the proposed terms of the recommendation, and of the reasons for it; and*
- (b) the provision of a reasonable opportunity for interested persons to consider the recommendation and make submissions; and*
- (c) adequate and appropriate consideration of submissions.”*

See section 166(2).

- 3.3 The SEIP Draft regulations come with a bulletin that *“explains, and should be read alongside”* the regulations.

- 3.4 Disturbingly that bulletin states:

“Many of the emission factors set out in the list in Appendices 1 and 2 are intended to be reviewed by external parties and are therefore subject to further analysis and confirmation.” Page 3

“These submissions will inform the ongoing development of the regulations.”
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- 3.5 It appears that significant parts of the regulations are expected to change after the consultation period has closed. Accordingly the current process cannot be consultation for the purposes of section 166, which requires proper consultation on the final form of the regulations.

- 3.6 A second major issue relates to the regulations for unique emission factors. To comment sensibly on these draft regulations we need to know how and when we would be able to apply for unique emission factors. Without this information we cannot assess whether the default factors are acceptable or not. And this is acknowledged in the bulletin:

“On balance, it is therefore proposed to adopt the third approach of providing default emissions factors but allowing firms to apply for unique emission factors.” Page 2

- 3.7 However the regulations for unique emission factors have yet to be drafted:

“Officials are working on developing an appropriate method for establishing unique emission factors for use in SEIP activities and will develop regulations outlining the process by mid-2009. Further consultation will be undertaken on the proposals for unique emissions in 2009.” Page 3

- 3.8 If the process we are currently in is meant to be consultation on regulations for the purposes of section 166 then it is clearly flawed and legally inadequate:
- (a) These are clearly not the final version of the regulations that will be recommended for enactment so the consultation requirements under section 166 will not be met
 - (b) To be able to comment on these draft regulations we need to also have the draft regulations for unique emission factors
 - (c) Given the announcement of a government review of the ETS it is likely that not all persons likely to be substantially affected will engage in this process.
- 3.9 It would also be inappropriate for officials to take responses to these draft regulations and advise Ministers that sufficient consultation has been undertaken to meet the government’s legal requirements under section 166 of the Act in respect of any proposed regulations relating to the stationary energy and industrial processes sectors.

4 Regulations

Default factors for fugitive emissions of methane

- 4.1 We have discussed with officials our concerns about the inherent inaccuracies associated with fugitive methane emissions measurements and the resultant equity and fairness problems. **These issues remain unresolved and will result in financial obligations being placed on Solid Energy by way of arbitrary default factors that bear little connection with actual methane emissions from coal mining.**
- 4.2 We have been advised by officials that the Act does not require a defined level of accuracy before it places an obligation on someone. This is an extraordinary position to be taken by officials. Natural justice principles inherently suggest that any tax imposed should be certain and fair. If the government wishes to tax fugitive emissions of methane then that tax should be directly linked to the actual methane emitted not to an arbitrary default figure.
- 4.3 We reiterate the points we have made before around the measurement of fugitive emissions of methane from coal mining and in particular note:
- Methane gas is naturally entrained at pressure in the pores and cleats of coal seams. When a seam is entered or fissured methane desorbs into the atmosphere from the exposed faces or fissures. All other things being equal the volume of methane entrained in coal will vary directly with increasing coal rank and depth. Other properties of the coal seam such as porosity and permeability will influence the rate of desorption and the area extent over which desorption occurs when the seam is exposed. In some of the major coal producing provinces of the world; North America, parts of Europe, and Australia the geological

environment can produce seams of relatively consistent properties and continuities. That has enabled the IPCC to establish nominal methane emission factors for opencast and underground mining by coal rank. In the context of those coal mining provinces it might well be feasible to establish a practical and cost effective basis on which to levy an emissions charge.

- That is certainly not the case for New Zealand nor, for example, Japan and Indonesia where active tectonic plate boundaries underlay the coal fields and intensive faulting has produced anomalous high rank coals at shallow depths and has ensured seams are discontinuous, highly fissured and extremely variable in a wide range of properties over short distances. A particular example is that very few mines in the world operate hydro monitors for underground coal production as Solid Energy does. In this light establishing a practical, cost effective basis on which emissions could be reliably calculated for the purpose of emissions trading appears unfeasible.
- According to the IPCC (on which the default emission factors for methane have been based) the error level is between +/-200% for fugitive methane emissions from coal mining, even before taking into account New Zealand's particular set of circumstances. We are concerned at having a cost obligation placed on us with such a high level of inherent inaccuracy.
- Further, we consider that the emissions formulae developed for fugitive methane emissions is inappropriate, particularly for underground mines. Our experience shows that the levels of methane emitted from our underground mines shows **virtually no correlation** to the tonnes of coal extracted. The application of the formula proposed compounds the inherent unsuitability of the emission factors proposed to create a liability that has no relation the actual emission profile.
- In the case of New Zealand opencast operations, these work coal seams at relatively shallow depths and in many cases the seams outcrop at the surface. The methane originally present in the seams has naturally desorbed into the fissures and then through the shallow, permeable overburden. In short there is little, if any, methane left in the seams being mined. Indeed, this is even the case in some operations worked by underground mining methods. Historically, the underground mines in the Millerton and Denniston coal fields were gas free (and smoking was permitted underground!).
- Solid Energy operates and plans to operate opencast mines in areas which have been mined before. It is probable that in many circumstances that the methane content of these coal seams will be close to zero. We have been able to provide detailed maps detailing where potential previous underground workings have occurred on currently planned and operating mines. However, we have been provided no guidance around an appropriate (in terms of cost associated with the process) methodology to obtain an appropriate emission factor.

- In respect of underground mining, the extreme variability of the properties of New Zealand coal seams over relatively short distances and the difficulty that imposes for imposing a charge on methane emissions has been set out above. While in theory fine-scale sampling of the methane make of seams worked by underground mining methods could be undertaken the cost would be prohibitive and would require closely spaced drilling and sampling from the surface to enable the mine operator to determine if the resource could be economically recovered inclusive of a tax on the methane emissions.
- Further, there are a host of other practical difficulties. Methane desorbs from the interstices of coal exposed to atmospheric pressure over time. The rate at which it desorbs is a function of a wide variety of factors not all of them to do with the properties of the coal itself. The desorption rate will vary, for example, with the production size split. Methane will desorb more rapidly from production with a higher proportion of fines than large diameter product.
- Methane will be emitted not just from the coal that is extracted but from the coal that is exposed but left in place underground. Typically, underground extraction percentages vary in NZ conditions from less than 15% to in excess of 50%. The total amount of methane emitted from an underground operation will vary, therefore, with mining methods and systems and mine design and layout. These determine coal recovery rates and the percentage of coal left in place post extraction. Again, unlike underground operations in more established coal provinces, extraction rates in New Zealand operations vary widely and locally. Assumptions would have to be made for all these factors in designing a emissions factor that accurately reflected the emissions in a particular context. It is common practice in spontaneous combustion-prone NZ conditions to mine to the rise and to flood worked-out sections as they are abandoned. At some point in time dependent on the rate of extraction and progression to the rise the hydrostatic head of water on the coal left in place will equal the pressure the methane is entrained at and will lock the methane in place. Another common practice is to seal the goaf area and allow the methane to 'flood' the area, achieving concentrations above the combustible range (15% concentration). This methane is mostly preserved underground and will not reach the atmosphere.
- In underground mining operations frequently intercept gas "blowers" in fissures and faults that otherwise vent naturally to the surface. Again, once intercepted these have to be vented through the mine ventilation system for safety reasons but should not be considered anthropogenic emissions for the purpose of a charge. Calculating the proportion of methane in the exhaust air that would otherwise vent naturally to the atmosphere or is attributable to a previous operator's production would prove highly problematical.
- Solid Energy maintains some monitoring equipment for methane measurement at underground sites but this is safety equipment for monitoring concentrations and not designed for calculating emissions.

We have a concern that obtaining sufficient accuracy of an emissions level for our activity will be prohibitive, especially for opencast activities.

- 4.4 Accordingly we think that given all the inherent difficulties in measuring fugitive emissions of methane actually associated with coal mining as to opposed to the emissions occurring naturally, the cost of properly establishing which emissions are anthropogenic and which natural and the unfair financial cost of simply applying the IPCC factors (which significantly overstate the emissions) consideration should be given to zero rating these emissions or removing them from the ambit of the Act.
- 4.5 We note that this was the conclusion reached previously by officials and included in their report to the Select Committee on the proposed Bill.
- 4.6 The other issue arising is the calculation of “Fugitive emissions from mining” includes fugitive emissions from the mining process and from post-mining. We are uncertain whether this meets with the definition of the Act for eligible emissions. Further, the emission factors for mining and post-mining are based on IPCC guidelines, which provide a low, average and high option. In the regulations, depth (overburden or seam) is used to determine the appropriate emission factor for mining fugitive emissions, i.e. low, average or high, yet in the case of post-mining emissions only the average emission factor is used. This discrepancy has not been explained adequately
- 4.7 Information requirements: The information requirements associated with the emissions returns for coal mining are onerous, impractical and ill defined. In particular:
- Solid Energy does not maintain detailed record of the overburden ‘depth’ of its mining activities. We are unaware of any practical approach to differentiate between opencast coal mined at the depths prescribed.
 - Given the topography that we operate in, accurate measurements of the depth of the coal is impractical. Solid Energy operates in areas where there are significant ground level variations on the surface and significant variances in the distribution and height of the coal seam itself. These will present significant impracticalities in conducting any measurement process
 - We are unaware of what definition of depth is to be adopted
 - There is no detail provided regarding the level of accuracy required in the measurement of the depth of mining. Without this, we are unable to assess what processes we need to adopt to conduct the measurement process
- 4.8 In previous publications from the government, i.e. New Zealand's Greenhouse Gas Inventory 1990-2006, the uncertainty range for emission estimates are $\pm 5\%$, and $\pm 50\%$ for CO₂, CH₄ and N₂O, respectively. The larger uncertainties associated with non-CO₂ gases are because emissions are dependent on combustion conditions. Key concerns are:
- Is it reasonable to include CH₄ and N₂O emission factors within the regulations if the uncertainties are substantial and entirely dependent on consumers' equipment and operating conditions?

- In addition these emission factors are likely to be based on IPCC default values, therefore are not New Zealand specific. We discuss several of these in more detail,
- Further, due to the upstream nature of the ETS, customers who are unable to opt in are not able to apply for a Unique Emissions factor. This which appears inequitable and does not provide sufficient encouragement to customers to improve their operating efficiencies.

Default Factors for Coal

- 4.9 As noted to officials, the categories of coals included within the Schedule 2 of regulations are incomplete and inaccurate. The definition ‘coking coal’ should be removed from Table 1, as Coking coal is traditionally either a Bituminous or Anthracite coal. As noted previously to officials, the emission factors contained are approximate and Solid Energy will need to better understand the process associated with applying for Unique Emission Factors to obtain more accurate emission factors.

Default Factors for Coal Seam Gas

- 4.10 Coal seam gas is given the same emission factors as unprocessed natural gas. This will need to be corrected through a unique emission factors as it is apparent that officials have undertaken insufficient analysis of emission factors associated with coal seam gas.
- 4.11 As noted to officials, insufficient research and analysis has been conducted in identifying technologies available to mitigate methane emissions. We note that the well established and practised process of thermal oxidation has not been included as an accepted mitigation process with a prescribed emission factor. We suggest that additional research is conducted and the full range of methane mitigation technologies are included within the regulations.
- 4.12 The calculation methodologies are unduly complicated. This in part appears to be a reflection of the inadequacies in the drafting of the bill as the default participant is liable for the mining of the coal whereas the emissions are associated with the consumption of the coal. In particular we are concerned that:
- Given that emissions returns include mined coal, there will be a permanent stockpile adjustment that increases every year as SENZ stockpile ‘coal’ that we do not and can not sell. For some of our operations, the difference between mined coal and saleable coal (which is the coal that may be combusted) can be up to 10%. This difference is either non saleable coal or ash (non coal) which will not be combusted.
 - It would be possible to simplify the regulations and allow participants to calculate their actual emissions without the current high level of complexity associated with the formulas. The penalty regime associated with the Act will be a sufficient deterrent to ensure compliance.

Other Issues

- 4.13 We have sought clarification from officials around specific aspects of coal mining that we consider have not been addressed. These include:
- Solid Energy is concerned around the timetable proposed to develop and implement these regulations. From our perspective, the issues associated with the confirmation of the fugitive methane emissions are just as difficult as the issues associated with agriculture, but agriculture has additional years to work through these problems.
 - In Solid Energy's case, many of its existing underground operations were acquired from the Crown. Some proportion of the methane being exhausted from these operations comes from old workings attributable to Crown operations, such as East Mine. This methane is, in effect, an unforeseen Crown liability and should not become a charge against current production.
- 4.14 We understand that methane and nitrous oxide emissions associated with the combustion of wood waste for industrial heat will be included within the regime. We consider that this will now, potentially unintentionally include our pelletised wood products that we produce from woodwaste. If so, this will dramatically increase the number of participants within the scheme who will have to provide emission returns on very small emission levels