# Coal Association of New Zealand

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Emissions Trading Group
Ministry for the Environment
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Here is the Coal Association submission on the draft Climate Change (Stationary Energy and Industrial Processes) Regulations 2009 and Climate Change (Unique Emissions Factors) Regulations 2009.

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Yours sincerely,

(for) Chris Baker
**Chairman**

# SUBMISSION OF THE COAL ASSOCIATION ON THE DRAFT CLIMATE CHANGE (STATIONARY ENERGY AND INDUSTRIAL PROCESSES) REGULATIONS 2009 AND CLIMATE CHANGE (UNIQUE EMISSIONS FACTORS) REGULATIONS 2009

## INTRODUCTION

The Coal Association welcomes this further opportunity to work with government to develop a durable climate change policy. The Association liaises with the government and the community, and promotes government and industry research investment to strengthen the industry's competitiveness and environmental acceptability.

### The Coal Association

The Coal Association of New Zealand (Inc.) represents coal producers and the wide range of coal users in New Zealand. Members account for more than 95% of the coa1 produced in New Zealand each year. In total, 15 coal mining enterprises in New Zealand are producing 4.9 million tonnes of coal annually from 23 operating mines. This has a value of over $500 million. Most of the output is exported either directly as coal or indirectly by adding value to exports, particularly steel, dairy, meat and forest products.

### Inherent inaccuracies with fugitive methane estimates

The Coal Association and others have discussed with officials concerns about the inherent inaccuracies associated with estimating fugitive methane emissions from coal mining. There appeared to be widespread agreement at the recent coal sector workshop that the proposed default emission factors would provide a very poor basis for determining a financial liability. The imposition of arbitrary and unfair costs on coal suppliers and users would threaten the credibility of the Emissions Trading Scheme.

There is a major difference between the accuracy of estimated $CO_2$ emissions from coal use and the inaccuracy of trying to assess a highly variable emissions source like fugitive coal methane. A similar argument is being raised about the potential exclusion of

agricultural methane from the ETS because of the inequity and lack of specific measurement accuracy for highly variable emissions sources.

We repeat the main arguments for exclusion of coal methane from the ETS (or alternatively zero-rating):

1. Methane gas occurs naturally under pressure in the pores and cleats (like layers) of coal seams. When a seam is mined, drilled or fissured (including earthquakes), methane is released (desorbs) into the atmosphere from the exposed faces or fissures. In general, the amount of methane in coal will vary directly with increasing coal rank and depth. Other technical properties of the coal seam such as porosity and permeability will influence the rate of desorption when the seam is exposed.

2. In some of the major coalfields of the world (North America, parts of Europe and Australia) the geological environment over millions of years has resulted in seams of relatively consistent properties. The IPCC has been able to establish ranges of methane emission factors for opencast and underground mining by coal rank. For such coal mining regions, it might be reasonable to argue that an assessment method could be cost effectively established as a basis for an emissions charge.

3. In contrast for New Zealand (and other geologically active countries like Indonesia and Japan), earthquake faults have produced unusually high rank coals at shallow depths. The result is that seams are not continuous, rather, they are highly fissured and extremely variable in a wide range of properties over short distances. The practical impact for an emissions charge is that there is no cost effective basis on which emissions could be reliably calculated.

4. Many New Zealand opencast mines (and some underground ones) work coal seams at relatively shallow depths, often with seam outcrops at the surface. The methane originally present in the seams has naturally desorbed into the fissures and then

through the shallow, permeable overburden. Very little methane is left in such seams (an important safety advantage in the case of shallow underground mines).

5. The 2006 IPCC guidelines[1] basically confirmed 1996 guidelines figures on which the NZ default emission factors for methane have been based. Even without taking into account New Zealand's particular variability, IPCC stressed the high uncertainties (ranging from 50% to 200% of the average value) for expert judgement of generalised fugitive methane emissions from coal mining in a country. The IPCC assessed similarly high uncertainty levels for coal basin specific estimates and instead highlighted the advantages of individual mine monitoring (preferably biweekly or monthly measurements to smooth out variations).

6. The emissions formula developed for fugitive methane emissions has been found to be inappropriate for New Zealand coal, particularly for underground mines. Levels of methane emitted from Solid Energy's underground mines have been found to have very little correlation with the tonnes of coal extracted.

7. MED[2] has justified its high historical estimates of fugitive methane emissions on a 1992 paper, which claimed near world record levels of coal methane content for some NZ underground bituminous coals. Unfortunately, the paper gave the impression that high methane measurements from old, low output mines would be typical of higher output modern mines. The comparison with overseas mine emissions and with IPCC emission factors was not appropriate.

8. There are other practical difficulties relating to post-mining. Methane is released from the coal over a long period once it is exposed. The release rate depends on a variety of factors, a major one being the proportion of fine coal (faster release than large sized pieces or lumps of coal).

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[1] 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Intergovernmental Panel on Climate Change www.ipcc-nggip.iges.or.jp

[2] New Zealand Energy Greenhouse Gas Emissions 1990-2007, Ministry of Economic Development (2008).

9. Methane will be emitted from the coal faces that are exposed but left underground. Extraction percentages vary in New Zealand underground mines from around 15% to 50% so their total methane emissions will vary with mining methods and mine layout.

10. Other complexities are that worked out sections of some underground mines are flooded as they are abandoned to avoid spontaneous combustion of the remaining coal faces, sealing in some of the methane that would otherwise be released. Other mines are sealed off for safety reasons so the methane concentrations would be above the combustible range but it is mostly preserved underground and will not reach the atmosphere.

11. Some underground mines have monitoring equipment to measure methane concentrations for safety reasons but these instruments are not designed for calculating emissions. Obtaining equipment with sufficient accuracy to determine emissions liability would add very high costs, especially for opencast activities.

12. The intention of any emissions charge or liability associated is to reduce the activity leading to those emissions. If the output can not be measured with any significant accuracy, then the effectiveness of any mitigation will be not be able to be assessed. Conversely, for coal methane emissions, mine operators could claim an improvement that could not be proven otherwise.

These factors lead to the Coal Association view that the proposed emission factors provide a very poor basis for determining a financial liability to be imposed upon coal suppliers and users. We believe the IPCC factors significantly overestimate the actual emissions but there will be high costs to prove this for individual mines (assuming the methodology difficulties can be overcome of differentiating between methane emissions from coal mining and emissions occurring naturally).

***Recommendation*** *The Coal Association recommends the government conclude that coal methane emissions should not be included in the ETS on the grounds of liability*

*ownership, sampling and measurement inaccuracies, and potential conflicts between using ventilation monitoring for safety and for liability determination..*

**Unique Emissions Factor procedure for coal methane**

If the government instead believes all of the inherent difficulties in measuring fugitive methane emissions can be overcome, coal mine operators need to know soon the procedure for establishing unique emission factors to avoid paying for overestimated liabilities when the ETS commences. Last year, ETS Bulletin 8 promised "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." No such procedure has been provided.

Officials indicated at the coal sector workshop a willingness to work with the coal industry to develop a UEF procedure for coal methane. We propose that the coal industry will undertake a research programme to establish a measurement procedure to an agreed level of accuracy based on ventilation monitoring.

***Recommendation*** *The Coal Association recommends that if coal mining methane remains in the ETS:*

- *It is essential that on the basis of this research, a UEF procedure is established for the four currently active underground coal mines rather than use the unrealistically high numbers chosen by MED.*
- *An appropriate interim Default Emissions Factor to be used is the one used for Australian NGERS reporting: 0.008 tCO2e per tonne of coal for a non-gassy underground mine. Surface mine emissions are likely to be so low that they should be considered negligible in the interim period before research information is available on New Zealand surface mines.*

This would help achieve some degree of harmonisation with the proposed Australian ETS, ensure that trade exposed coal exporters are treated similarly on both sides of the

Tasman and provide a price incentive to reduce mining methane emissions by utilisation or flaring where these technologies are economically feasible.

If a UEF procedure is to be developed, it should include the following parameters (among others yet to be considered):

- The proportion of total mine ventilation air sampled during each gas measurement period (that is, if one of three ventilation shafts is sampled, is that one third of the total ventilation volume for that sampling period?)
- The variability of the ventilation air volume and methane concentration throughout the year (to prescribed levels of accuracy).
- The details of the calibration of the ventilation volume monitoring instruments and methane measurement instruments.
- A factor indicating the proportion of the mine emissions that are estimated to have been anthropogenic rather than natural (this will involve geological assessment of the escape rate from old underground workings, for example).
- The gas measurement method to be used for determination of in situ surface mined coal methane and the determination of post-mining emissions of both underground and surface mined coal (to prescribed levels of accuracy).
- For a particular coal, the variability of surface mined coal methane emissions for different periods and coal sizes and storage treatments (as assessed from in situ methane measurements).
- For a particular coal, the variability of post-mining coal methane emissions for different periods and coal sizes and storage treatments (as assessed from in situ methane measurements).
- For a particular exported coal, the variability of the period before a mined coal is exported (and therefore the proportion of emissions that are beyond NZ shores and the responsibility of another country).
- For a particular imported coal, the in situ methane content at the point of entry, the post-mining emissions rate for typical size and storage conditions and the variability of the period before that coal is utilised (and therefore the proportion of

post-mining emissions that are within NZ shores and the responsibility of this country).

**No exclusion threshold for Default Emissions Factors**

The Coal Association accepts that the Default Emission Factors for $CO_2$ may well cater for changes in mining conditions (seam properties with respect to weathering, splint etc.), although this has yet to be confirmed for industrial coal samples. However, we believe there is no need for the officials to introduce an arbitrary exclusion threshold.

***Recommendation*** *The Coal Association recommends there is insufficient justification for the need to introduce an arbitrary exclusion threshold. The coal miner or importer should be able to decide whether it is worth applying for a UEF rather than be restricted if it is close to the default factor.*

**Inherent inaccuracies with combustion methane and nitrous oxide estimates**

The Coal Association has concerns about the ETS inclusion of default emission factors based on combustion methane and nitrous oxide estimates (IPCC 1996 default factors rather than the updated 2006 ones). The high uncertainty range for these emission estimates (± 50% according to MED) are because emissions are heavily dependent on the wide range of boiler (or kilns etc.) equipment and operating conditions.

The majority of coal users will not be able to opt in to the ETS and so will not able to apply for unique emissions factors, if a meaningful methodology can be established for such inaccurate quantities. They would be required to pay the liability passed through from the coal supplier yet there would be no incentive to improve their operating efficiencies.

***Recommendation*** *The Coal Association recommends that if a large coal user wanted to go to the high expense of measuring combustion methane and nitrous oxide, there should be an easier means of obtaining a UEF (similar to the waste sector). This UEF process should be separate from the consideration of the $CO_2$ Unique Emissions Factor.*