

Our place is special: the response of a major fossil-fuel company to emissions trading developments in New Zealand

I.G. Mason¹, M.J. Milne² and A. Ball²

¹Department of Civil and Natural Resources Engineering, and ²Department of Accounting and Information Systems, University of Canterbury, Christchurch, New Zealand

Corresponding author:

Ian Mason

Department of Civil and Natural Resources Engineering

University of Canterbury

Private Bag 4800

Christchurch 8140

New Zealand

Email: ian.mason@canterbury.ac.nz

Proceedings of the 11th Australasian Conference on
Social and Environmental Accounting Research, 2-4 December 2012,
University of Wollongong, New South Wales, Australia.

Our place is special: the response of a major fossil-fuel company to emissions trading developments in New Zealand

Structured Abstract

Purpose: To examine and interpret the activity, arguments, and policy proposals put forward over a four-year period by a major state-owned fossil-fuel company, on climate-change policy and emissions trading in New Zealand.

Design/methodology/approach: The signing of the Kyoto protocol by the New Zealand Government in 1997, followed by the introduction of Climate Change Response legislation in 2002, and the proposed introduction, and subsequent implementation, of a New Zealand emissions trading scheme between 2007-2011, provide the empirical context for our research. In order to investigate the position on GHG management of a key member of the fossil-fuel industry, submissions on each of the four stages of pre-consultation and review process on the emissions trading scheme were analysed, with a focus on key arguments, policy proposals, and degree of involvement in policy formulation. The company responses were evaluated from a legitimacy theory perspective.

Findings: A notable position on emissions control, in which it was argued that New Zealand should be allowed to increase gross emissions over time, whilst relying on carbon sinks, primarily forestry, in order to meet net emissions targets, was revealed. The rationale was that since most New Zealand production processes are less emissions intensive than those elsewhere, New Zealand should enjoy a privileged position in the production of certain commodities relative to other countries. Economic growth, emissions leakage and energy efficiency arguments were invoked to support the position that net emissions reductions should only be made if required by international treaty obligations, and then only in line with actions of key trading partners. It was argued that if an emissions trading scheme were to proceed it should provide maximum support for emitters, free allocations, subsidised allocations, delayed entry of sectors into the scheme and an extended phase-out period for free allocations. The company was found to have played a major role in the submissions process.

Practical implications: The key argument that gross emissions reductions should take place where they are most effective from a global perspective - that is at your place, not ours - raises significant questions about how this goal might be achieved in a real political context. At the same time as proposing this policy, the company noted that the chances of a post-Kyoto global agreement on emissions reduction were looking slim – and continued with a high level of fossil-fuel production, including plans to produce new lignite-derived products. From a legitimacy perspective, the company initially appears as a good environmental citizen by agreeing to abide by net emissions controls within internationally set limits, and that long-term low-carbon goals are valid. However, by continuing with a business-as-usual policy regarding gross emissions, and relying on carbon sinks to meet net emissions limits, serious questions regarding carbon lock-in, and appropriate time frames for the inevitable transition to a renewables-based economy remain. The present strategy does not allow for any substantial reduction in net emissions over time, given the limited size of forestry sinks in New Zealand.

Originality/value: Contributes a significant insight into the thinking of a fossil-fuel company on climate change policy, economic growth and international agreements. Demonstrates how policy responses framed in terms of concern for global climate change, can result in limited action, with little likely impact on cutting long-term net emissions to the degree indicated for developed countries such as New Zealand, in a timely manner. Indicates the degree, and sophistication, of lobbying on climate change policy by a state-owned corporation, and illustrates and critiques the apparent legitimacy created.

Keywords: climate policy; emissions trading; fossil-fuel industry, lobbying; legitimacy

Our place is special: the response of a major fossil-fuel company to emissions trading developments in New Zealand

I.G. Mason¹, M.J. Milne² and A. Ball²

¹Department of Civil and Natural Resources Engineering, and ²Department of Accounting and Information Systems, University of Canterbury, Christchurch, New Zealand

1. Introduction

North American and European corporate and business responses to climate change since the 1990s have typically followed a path from aggressive resistance, climate change denial, and active attempts to discredit the climate science, through acceptance of the climate science, followed in some cases by active engagement in the creation of regulatory frameworks, enthusiasm for greenhouse gas (GHG) inventory measurement, carbon trading and investment in efficiency improvements (Levy and Egan, 2000; van den Hove et al., 2002; Levy and Egan, 2003; Kolk and Pinkse, 2005; Levy and Jones, 2006; Jones and Levy, 2007; Pinkse and Kolk, 2009; Weinhofer and Hoffmann, 2010). Prior to the signing of the Kyoto protocol in 1997, proactive responses were reportedly uncommon (Pinkse and Kolk, 2009) and the initial reaction of the fossil fuel industry in the USA to concerns about global climate change through the 1990s was described as aggressive and unsurprising (Levy and Egan, 2000; Levy and Egan, 2003). A change in stance was noted in mid-1999, with many companies accepting the scientific basis for action and acknowledging the precautionary principle, despite the fact that the chances of the USA ratifying the Kyoto treaty were considered slim, even prior to the election of the Bush administration in 2000 (Levy and Egan, 2003). Several multi-national oil companies were included in those who took this position (Kolk and Levy, 2001). Consequent activity included investment in low-emissions technology, promotion of voluntary partnerships between business and government agencies, and enthusiasm for the use economic instruments, which was interpreted by (Levy and Egan, 2003) as demonstrating an adoption of the win-win discourse of ecological modernism. Subsequently, a resurgence of corporate opposition to emissions restrictions, at the same time as the focus of policy and regulatory action in the USA moved to state level, was reported (Levy and Jones, 2006; Jones and Levy, 2007). In contrast, European businesses were assessed as being, on the whole, more accepting of the climate science, more willing to acknowledge the inevitability of regulation and more ready to invest in low-emissions technologies (Jones and Levy, 2007). As corporate and business positions have evolved various typologies have emerged to describe them, including: fight against emissions; wait and see; and proactive; (van den Hove et al., 2002) and indifferent; beginner; emerging; and active (Jeswani et al., 2008).

Levy and co-authors have pointed out an apparent paradox between substantial climate-related activity and little evidence of fundamental change (Levy and Jones, 2006; Jones and Levy, 2007). With the focus on low-emissions technology however this is unsurprising, given the fundamental difference between absolute emissions and emissions intensity. Oil companies were quick to recognise, for example, that reduction in oil consumption due to improved efficiency would be more than offset by increasing vehicle sales and distance travelled (Levy and Egan, 2003; Jones and Levy, 2007). Similarly, a large pharmaceutical company reported a 16% reduction in emissions intensity, whilst at the same time its absolute emissions rose by 10% due to a 29% increase in production (partly due to an acquisition) (Pinkse and Kolk, 2009; p 76). Furthermore, investments by oil companies in renewable energy have been described as miniscule in relation to their core, and expanding,

oil and gas operations (Levy and Jones, 2006; Jones and Levy, 2007). It has also been argued that in North America, businesses were willing to take action on climate change consistent with a weak, fragmented and largely voluntary regime for carbon emissions control; one which they helped to construct (Levy and Jones, 2006; Jones and Levy, 2007).

A flexible response framework, such as a cap-and-trade system, offers businesses some degree of choice in their preferred actions. Options have been broadly categorised as either innovative or compensatory e.g. Kolk and Pinkse (2005); Pinkse and Kolk (2009), reflecting emissions reductions, and purchase of carbon credits, respectively. With reference to the New Zealand Carbon Neutral Public Service Programme Mason and Ball (2008) referred to reductions and offsetting as complimentary actions, and described the changeover point as the 'offset threshold'. Weinhofer and Hoffmann (2010) proposed that corporate strategies could be categorised as: CO₂ compensation; CO₂ reduction; and carbon independence. With respect to the carbon market, businesses have been grouped as adopting either: conformist; entrepreneur; evader; or arbitrageur, positions (Pinkse and Kolk, 2009).

Corporations and businesses have frequently engaged in the political processes around climate change in order to influence policy and rules e.g. Haigh, (2008); Pinkse and Kolk, (2009), and indeed have been encouraged to do so (Hoffman, 2007). As noted by Pinkse and Kolk (2009), one potential outcome of this strategy is 'regulatory capture', whereby companies are able to convince regulators to implement a target that does not go beyond 'business-as-usual'. A target based on GHG emissions intensity or energy intensity, instead of absolute emissions or energy reductions, was cited as a typical example.

The literature has tended to focus on large corporations and businesses in North America and Europe, and somewhat less known is known about business responses in other parts of the world. Furthermore, whilst responses of multinational oil and gas producers have been well documented, there is little or nothing reported on coal industry responses. Given that coal is responsible for a major proportion of fossil fuel emissions globally and that under business-as-usual consumption is projected to increase substantially (IEA, 2011), this is a significant omission.

From a theoretical perspective, institutional scholars employ legitimacy as a significant construct in interpreting the actions of organisations (Scott, 2008, p59; Bruton et al., 2010), and the pursuit of legitimacy has been rated to be as important as "narrow" economic objectives (Levy and Egan, 2003). One important means of enhancing organisational legitimacy is the use of environmental disclosures (Patten, 1992; Cho and Patten, 2007; Cho et al., 2012). Legitimacy may include both cognitive and socio-political elements, as explored in the context of an emerging biorefinery industry by Peck et al. (2009). In relation to change, the ability of activist groups and regulatory threats to challenge and change the legitimacy of organisational conceptual frameworks was discussed by Reid and Toffel (2009). In the context of this paper we argue that legitimacy is a key concern of fossil fuel companies, given that their products are the principal source of global greenhouse gas emissions, and we suggest that their actions should, at least in part, be examined from this perspective.

The objectives of this paper are: a) to report the activity, arguments and policy proposals put forward over a four-year period by a major state-owned fossil fuel company on climate change policy and emissions trading in New Zealand; and, b) to evaluate the extent to which this stance bestows environmental legitimacy to the company, in the light of emerging evidence for global climate change and science-based calls for deep emissions reductions.

2. Overview of New Zealand climate change policy development

On the 19th December, 2002 the New Zealand government ratified the 1997 Kyoto Protocol under the United Nations Framework Convention on Climate Change (UNFCCC), agreeing to a target of reducing greenhouse gas (GHG) emissions to 1990 levels during the 2008-2012 commitment period (UNFCCC, 2002), or failing that, to “take responsibility” for any excess emissions (MfE, 2011). To enable the commitment to be met, a Climate Change Response Act 2002 was passed into law on 18 November, 2002 (NZ Government, 2002). The stated purpose was as follows:

The purpose of this Act is to enable New Zealand to meet its international obligations under the Convention and the Protocol, including but not limited to,-

- a) its obligation under Article 3.1 of the Protocol to retire units equal to the number of metric tonnes of carbon dioxide equivalent human-induced greenhouse gases emitted from the sources listed in Annex A of the Protocol in New Zealand in the first commitment period; and
- b) its obligation to report to the Conference of the Parties via the Secretariat under Article 7 of the Protocol and Article 12 of the Convention (NZ Government, 2002).

The Act did not specify precisely how its purpose was to be met. A government policy package released in 2002 by the then centre-left Labour Party led coalition proposed an emissions charge as a key economic instrument (MfE, 2002). Over the next few years the use a carbon tax and an emissions trading scheme (ETS), was considered and debated. Following a climate change policy review, released in 2005, the carbon tax was abandoned (MfE, 2005). In December, 2006, a series of discussion documents on energy and climate change were released for public consultation, in response to which over 3000 submissions were received, and 150 public meetings were held (NZ Government, 2007). Subsequently an Emissions Trading Group comprising representatives of five government departments was established to develop a proposal for an ETS. The proposal was released on 20 September, 2007, and drafted for incorporation into legislation, appearing on 4th December, 2007 in the form of the Climate Change (Emissions Trading and Renewable Preference) Bill (NZ Government, 2007). In this Bill the following addition to the purpose of the Climate Change Response Act was proposed:

The purpose of this Act is to...

- b) provide for the implementation, operation and administration of a greenhouse gas emissions trading scheme in New Zealand (NZ Government, 2007).

The structure and operation of the proposed New Zealand ETS (NZ ETS) were described in legislative detail in the 2007 Bill. The NZ ETS was to incorporate all gases in the Kyoto Protocol (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons (HFC), perfluorocarbons (PFC), sulphur hexafluoride (SF₆)), and involve all-sectors. Sectors were indicated by listing activities requiring participation, plus additional activities eligible for voluntary participation (Table 1).

Points of obligation were primarily processing organisations. For example, processors of dairy products were to be responsible, as opposed to individual dairy farmers. Staged entry was proposed, ranging from a retrospective 1 January 2008 for forestry, though 1 January, 2009 for liquid fossil fuels, 1 January 2010 for stationary energy and industrial processes, to 1 January 2013 for agriculture and waste. Public submissions were invited, with a closing date of 29 February, 2008. Submissions were heard by the Finance and Expenditure Select Committee of the NZ Parliament, which reported back to the parliament on 16 June, 2008.

Table 1. Activities requiring or eligible for participation in the NZ ETS as scheduled in the Climate Change (Emissions Trading and Renewable Preference) Bill (NZ Government, 2007)

Activity	Status	Inclusions/comments
Forestry	Required	Pre-1990 forests
Liquid fossil fuels	Required	Obligation fuel > 50,000 litres/year
Stationary energy	Required	Coal, gas, geothermal, waste combustion, petroleum refining involving fossil fuel combustion
Industrial processes	Required	Steel, aluminium, calcination, glass (soda ash process), gold (limestone process), cable (N cure process), HFC or PFC imports, NaF ₆ imports
Agriculture	Required	Nitrogenous fertilisers, animal processing, dairy processing, animal farming
Waste	Required	Disposal site operation
Forestry removal	Eligible	Post-1989 forests
Other removal	Eligible	Products with embedded emissions, either permanent, or to be exported
Liquid fossil fuels	Eligible	Obligation jet fuel > 10 million litres/year
Stationary energy	Eligible	Purchase of > 250,000 tonne/year of mined coal or > 2 Petajoules/year of natural gas

On 25 September, 2008 the Climate Change Response Emissions Trading Amendment Act was legislated, and on 26 September, 2008 an updated Climate Change Response Act 2002 was passed into law. This version of the Act included the following extension to the original statement of purpose:

The purpose of this Act is to...

b) provide for the implementation, operation and administration of a greenhouse gas emissions trading scheme in New Zealand that supports and encourages global efforts to reduce greenhouse gas emissions by assisting New Zealand to meet its international obligations under the Convention and the Protocol, and by reducing New Zealand's net emissions below business-as-usual levels (NZ Government, 2008).

In November, 2008 a general election was held and won by a centre-right National Party led coalition, which had campaigned, in part, on reform of climate change legislation. A promised review of the NZETS was implemented in December, 2008, with submissions heard by an Emissions Trading Review Select committee. The eventual closing date was 27 February, 2009, and the committee reported back to the parliament in August, 2009.

Subsequently the Climate Change Moderated Emissions Trading Amendment Bill, was introduced to the NZ Parliament on 24 September, 2009 (NZ Government, 2009). Major changes included an extension of entry dates, a more generous allocation of permits and a longer free allocation phase-out period for certain sectors. A further round of submissions was then invited on the Bill itself, with a closing date of 13 October, 2009. Submissions were once again heard by the Finance and Expenditure Select Committee of the NZ Parliament, which reported back to the parliament on 16 November, 2009.

A further review of the NZ ETS, as required under the Climate Change Response Act 2002, was announced in December, 2010. A call for submissions was issued on 11 March, 2011, with a closing date of 6 April, 2011, and the committee reported back to the Minister of Climate Change Issues on 30 June, 2011.

Key dates for submissions on all four stages of the submissions process to date are summarised in Table 2.

Table 2: Summary of the submission and reporting timelines 2007-2011

Bill/Review	Announced	Closed	Reported
Climate Change (Emissions Trading and Renewable Preference) Bill	4/12/07	29/02/08	16/06/08
ETS review #1	12/08	29/02/09	08/09
Climate Change Moderated Emissions Trading Amendment Bill	24/09/09	13/10/09	16/11/09
ETS review #2	11/03/11	06/04/11	30/06/11

3. Corporation background

Solid Energy is a major state-owned corporation in New Zealand, being one of a number of so-called “state-owned enterprises”. Its major business is coal mining (98.56% of production on a weight basis in 2010/2011), with very minor activities in wood pellets (1.4% of production in 2010/2011) and biodiesel (0.04% of production in 2010/2011). The estimated proportions calculated on an energy basis are essentially identical at 98.71%, 1.21% and 0.07% respectively. The history of the corporation dates back to 1987, prior to which the New Zealand Government had operated a coal mining trading enterprise known as State Coal Mines. On 18 December, 1986 a State-Owned Enterprises Act was legislated, and in 1987, the Coal Corporation of New Zealand Ltd, incorporating a large proportion of State Coal Mines, was created. A re-branding took place in 1996, with the name Solid Energy of New Zealand Ltd adopted – and a sub-title “Coals of New Zealand” appeared subsequently, the latter firmly identifying the corporation as a coal business.

The present CEO (Dr. Don Elder) was appointed in May 2000, reportedly with instructions to close down either the whole business, or parts of it:

"I was hired, basically, to close the company down," Elder reportedly told a breakfast meeting in Westport, "It was a three-year job". (Wood, 2010)

This was subsequently clarified, with the principal explanation that the corporation was considered, on reflection, to potentially have a promising future.

...Elder said he had perhaps overstated the intention 10 years ago to close the company... “I wasn't employed to close the company down, I was employed at a time when the company had a business plan which saw any parts of the business that could readily be sold – which included the domestic business – being sold,” Elder said. (Wood, 2010)

“When I joined Solid Energy a decade ago, the company was barely viable...But there is nothing like a crisis to focus the mind.” (NBR,2010)

"[We recognised] that rather than the pervading view in New Zealand at the time – which was that coal was a sunset industry – in fact it was quite possible although not certain that the opposite was the case and coal was at the beginning of a new rise," Elder said. (Wood, 2010)

Within three months Elder and other members of the management team had adjusted their view of how world energy markets were developing, and took a much more bullish view that has driven the company forward to now. (Wood, 2010)

Since 2000 the corporation has returned dividends to the New Zealand government in 2004, 2006, 2009, 2010 and 2011. In 2012 major job losses were announced, attributed to a downturn in world coal prices. However, Solid Energy has been, and remains, a major player in the New Zealand energy sector, and a major exporter, employer and energy user. In their own words:

Solid Energy is New Zealand’s largest energy producer, including coal, renewable (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. 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... (CC Bill submission, 2007)

The present CEO was chairman of the World Coal Institute (now the World Coal Association) from 2008-2010, and served as a director from 2003. He has also been a deputy chairman of the international Coal Industry Advisory Board to the International Energy Agency (IEA).

In relation to climate change issues, the corporation has been actively lobbying since approximately 2000. Again in their own words:

Solid Energy has for over ten years now been participating in the development of New Zealand's domestic policy response with respect to climate change issues. We have provided significant input on voluntary agreements, negotiated greenhouse agreements, carbon taxes and emission trading schemes as well as various proposed regulations. We have also participated in the technical advisory groups to the current emissions trading scheme...As a result of this engagement we have been involved in or supported a number of significant pieces of analysis to inform the debate... (Submission to ETS review #1, 2009).

4. Research Design and Methodology

Submissions by Solid Energy to each of the four submission/review stages described in section 2 were downloaded from the New Zealand Legislation website (NZ Government, undated). The present study was based on analysis of these submissions in which the positions and supporting arguments put forward on climate change policy and the ETS at each stage of the process were identified, summarised and then classified into principal component categories. The positions, arguments and strategies thus revealed were then assessed from a scientific and engineering viewpoint, and interpreted within a legitimacy theory framework.

5. Findings

5.1 Participation

Solid Energy participated in all four stages of the submissions process (Table 2). Their submissions varied in size from 68 pages (CC Bill, 2007) to 8 pages (ETS Review #2). A total of 113 pages were submitted over the four stages, placing Solid Energy in the top 21 out of 735 submitters in terms of submission size (Fig.1). Organisations comprised 20 of the top 21 submitters, making Solid Energy one of the top 20 in this category out of 430. Larger submissions were made by organisations such as Business NZ (313 pp) and Greenpeace (187 pp) for example, whilst only one submission from a private individual exceeded 50 pages, and only on account of the inclusion of a 268 page report from an outside organisation as a supplementary document. The inclusion of large reports not authored by the submitter as supplementary, or in one instance the sole, material, resulted in submissions of over 200 pages in two other cases. Over all four stages, 60.5% of all submissions totalled less than 5 pages, 75.5% totalled less than 10 pages, and 97.1% totalled less than 100 pages. Solid Energy also lobbied through several industry organisations, including: The Coal Association; Straterra; and the Major Electricity Users Group. These submissions are not discussed in the present paper.

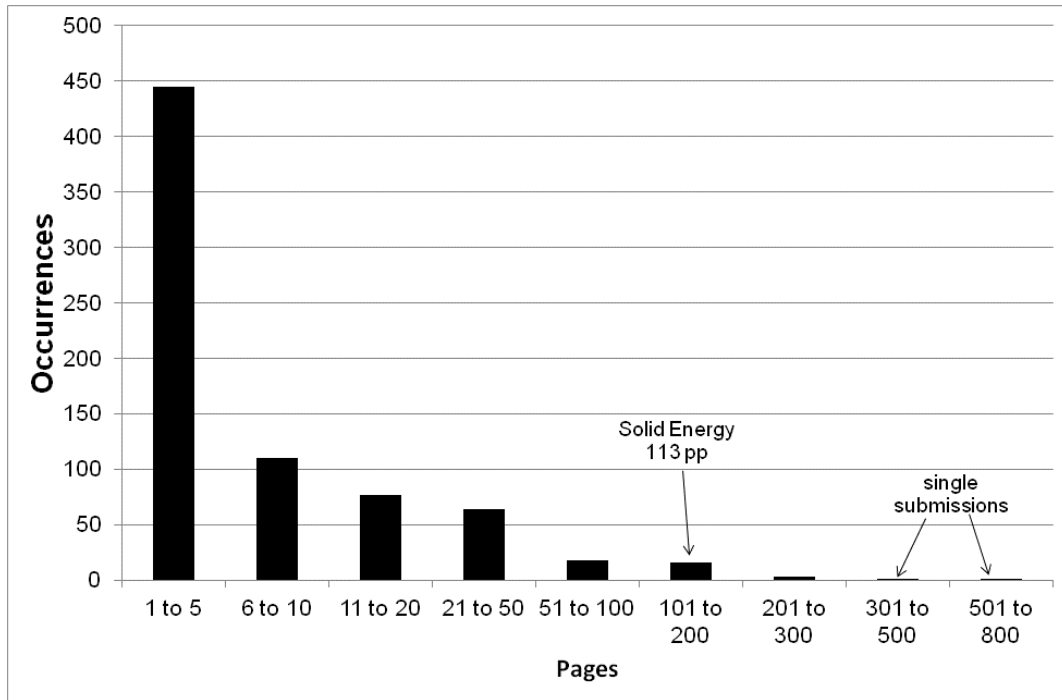


Figure 1: Occurrence of all submissions by size over the four stages of the submissions process.

5.2 Climate change policy

Solid Energy's preferred policy on climate change was contained in a document entitled "A Durable Climate Change Strategy for New Zealand". This was submitted to the ETS Review #1 as a supplementary submission. Key elements in this proposal were:

- New Zealand has a unique economy and therefore needs a unique climate change policy;
- Emissions-efficient industries in New Zealand should be incentivised to grow both for economic reasons, and in order to prevent that production moving to less emissions-efficient locations overseas (i.e. to avoid "emissions leakage");
- Excess emissions should be reduced by purchasing lowest-cost East European Assigned Amount Units (AAUs) in the short term, and through bio-sequestration, utilising extensive afforestation and land management programmes, in the short and medium term;
- Technical solutions to high-emitting activities should be sought through R & D;
- A comprehensive, globally linked NZETS should only be implemented when international preconditions are met. These preconditions appeared subsequently in the submission to ETS review #1, and are summarised in the next section (S5.3.4).

The policy was delivered with considerable confidence:

The strategy is complete, clear and simple. It is unquestionably workable and policy details will be easy to enact. It does not punish our industries irrespective of global realities and economic and social consequences. It supports our unique economic position and our best role in global climate change action. The strategy allows New Zealand to achieve the most significant medium-term reductions in net greenhouse gas emissions of any country. It positions us as an unquestioned leader among similar nations in future international climate change negotiations. Yet it also allows us to maintain and maximise our future economic growth and social prosperity, without significant penalty or risk... It is the best and the right climate change strategy for New Zealand. (ETS review #1, supp. p 1)

Ignoring Kyoto or taking advantage of a recession was not considered to be a good policy option, unless other countries were to follow the same approach:

Ignoring our Kyoto commitment to 2012 or trusting the economic downturn to address our short-term emissions is a poor option unless many other countries state that they will not meet their own obligations and are taking the same approach. (ETS review #1, supp. p 3)

The capacity for bio-sequestration was considered to be adequate for many decades:

Planting 1 million hectares of new exotic and indigenous forest over 20-30 years, combined with pest control and good land management, can offset emissions growth far beyond 2050 at cost \$2 – 15/t. This is far below the global price of carbon and will remain within our control. We will be able to grow our economy strongly, meet our climate change obligations, and show global leadership in agriculture, forestry and land-use management policies and technologies. At the same time we should implement “low-cost” emissions reductions, and develop and adapt technologies needed to achieve deeper long-term emissions in our unique economy...A simple, universal emissions levy at \$1/tCO₂ would fund the national elements of this strategy. (ETS review #1, supp. p 4)

5.3 Emissions Trading Scheme critique

5.3.1 Introduction

Solid Energy’s responses on the ETS fell into five principal categories: a) general principles on climate change; b) economic issues; c) policy issues; d) technical issues; and e) consultation process issues. Occurrences are shown in Table 3 and examples arguments/positions within each category are shown in Table 4. These results should be read in light of the stated position of Solid Energy that an ETS was not the best policy instrument for New Zealand, at the time (S5.2).

Table 3: Categorisation and occurrence of responses on emissions trading

Major category	CCBill ^a	ETS #1 ^b	CCMOD ^c	ETS #2 ^d
General principles	√	√	√	-
Economics	√	√	-	-
Policy	√	√	√	√
Technical issues	√	√	-	-
Process issues	√	√	√	-

Note: ^aClimate Change (Emissions Trading and Renewable Preference) Bill; ^bETS review #1; ^cClimate Change Moderated Emissions Trading Amendment Bill; ^dETS review #2

Table 4: Example arguments/positions

Major category	Argument/position	Reference
General principles	We support government’s objectives	CCBill ^a
Economics	Economic growth must continue	CCBill ^a
Policy	Emissions leakage will occur if we act unilaterally	CCBill ^a
Technical issues	Carbon capture and storage is essential	CCBill ^a
Process issues	Consultation was poor, rushed and limited	CCBill ^a

Note: ^aClimate Change (Emissions Trading and Renewable Preference) Bill;

Solid Energy prefaced its submissions by describing the corporation’s role as a major player and employer in the New Zealand economy, as a major energy user and producer, and as a corporation with international connections. It stated that it had consulted widely on climate change policy, both nationally and internationally. The company had engaged substantively and consistently with the submissions process, not only on general principles, but also on matters of detail.

Changes to the legislation were proposed, and in a number of instances the detailed legal language was rewritten. Such requests were introduced by statements like:

Set out below are specific comments/amendments that Solid Energy seeks in respect of the Bill to reflect the submissions made above. (CCBill, p 36)

To take account of the points made above the following amendments to drafting are required: (CCBill, p 38)

We recommend Schedule 4 Part 2 should be rewritten as follows: (CCBill, p 39)

We therefore recommend that section 30H should be deleted in its entirety. (CCBill, p 40)

For example, it was proposed that the purpose of the Climate Change Bill should be amended:

What is not set out is what the purpose of the emissions trading scheme itself is. This could be addressed by rewording...as follows:

“(b) Establish a greenhouse gas emissions trading scheme in New Zealand to support and encourage global efforts to reduce greenhouse gas emissions by:

1. reducing New Zealand's net emissions below business as usual levels; and
2. complying with our international obligations, including our Kyoto Protocol obligations while maintaining economic flexibility, equity and environmental integrity, at least cost on the long term.” (CCBill, p 36)

5.3.2 *Principles on climate change*

Solid Energy expressed support in principle for published Government policy objectives on climate change and nowhere in the written submissions was the climate science contested, nor was anthropogenic causation questioned. Here as elsewhere throughout the submissions process, net emissions were clearly identified as the target parameter, not gross emissions.

We support the Government’s objective...That a New Zealand ETS support and encourage global efforts to reduce greenhouse gas emissions by:

- reducing New Zealand's net emissions below business as usual levels, and
- complying with our international obligations, including our Kyoto Protocol obligations while maintaining economic flexibility, equity and environmental integrity, at least cost in the long-term. (CC Bill; p 4)

The concurrent achievement of environmental and economic goals, as stated in the government policy objectives, was seen a key requirement of any climate change strategy. This view was restated in subsequent newspaper correspondence:

...the mining sector is committed to finding solutions to reduce emissions, but these solutions have to be practical and must not undermine the economy and New Zealanders’ standard of living. (Elder, 2012)

5.3.3 *Economic arguments*

A belief in continued economic growth underpinned both economic and policy arguments advanced on the ETS. It was also strongly argued that New Zealand’s economy would continue to be dominated by primary production and processing for the foreseeable future.

Economic transformation objectives include economic growth through adding increased value in the primary sector. An ETS based on the Bill as drafted risks undermining this opportunity. (CC Bill, p 5)

New Zealand’s economy and strong current and projected growth is based largely on primary production. The world is experiencing a step change in prices of commodities that New Zealand has traditionally excelled in making and exporting e.g. dairy products. This is unlikely to change in the foreseeable future. (CC Bill; p 8)

Given that the key point here is added value, based on primary production, we note that this does not necessarily imply, or require, any expansion of primary commodity production. Solid Energy agreed in principle with results of national economic modelling by independent consultants, the Institute of Economic Research, but contested the detail. The

corporation stated that their own macro-economic modelling had shown that costs would be greater, and that the ETS as designed was not the least-cost option. It was further stated that the ETS would result in short-term reduction in employment and profits, and in a long-term reduction in the standard of living.

5.3.4 Policy arguments

An ETS was supported in general terms, but only if it operated at a global level, and within a properly functioning market. Preconditions to implementation were specified (ETS #1; p 11) and these are summarised below:

- Major trade competitors must face comparable costs and restraints
- Detailed analysis must occur prior to each sector entering the scheme
- Initial and transitional conditions must be based on analysis
- Free allocation domestically, intensity-based limits and price caps are required until a genuine global carbon price exists
- Transition to facing full carbon price must be consistent with the actions of trading partners

It was recommended that net GHG reductions should occur only to the extent required by international obligations i.e. New Zealand should do the minimum necessary. Commitments should be met in the cheapest way available e.g. through purchase of East European AAUs. Throughout the submissions, considerable emphasis was placed on highlighting the perceived uncertainty, or unlikelihood, of future, post-Kyoto, international agreements being reached, and on the lack of visible progress within a number of countries. In addition, projections by the IEA on the high degree of growth in fossil-fuel consumption over the coming decades were described in detail, and presented as fact, rather than as projections.

In fulfilling international agreements, it was argued that trade-exposed industries must be protected, otherwise emissions leakage, to countries with no, or lesser, controls on GHG emissions would result. Emphasis was thus placed on designing policy which would ensure that global (author's emphasis) emissions reductions would be achieved, and on the argument that this would be facilitated by allowing New Zealand to continue with, and indeed increase, many GHG emitting activities:

Global emissions consequences should be explicitly recognised so that where New Zealand production has lower emissions intensity than other countries we do not reduce our own production and emissions but create a net increase in global emissions. (CC Bill, p 6)

New Zealand's emissions-intensive industries were described as presently operating, or able to operate, at "world's best practice" levels of emissions intensity (i.e. lowest GHG emissions per unit of production), or close to these levels. Since many New Zealand industries were already at world's best practice, there was little potential for improvement in the short-term:

Because most of New Zealand's emissions-intensive industries are also emissions efficient by global standards, New Zealand is the logical global location for many of these. Maintaining and increasing this position offers the best outcome for global emissions and a positive outcome for our economic and social prosperity. An ETS based on the Bill as drafted risks consequences contrary to this principle. (CC Bill; p 5)

The potential for significant near-term reductions in emissions from most of our primary sectors and other energy intensive industries is limited, because those industries are already performing at or near world's best practice in the use of energy in production. Where this occurs it is in the best interests of global emissions reduction that we continue to produce those goods (and even increase our production to displace more emissions intensive production elsewhere). (CC Bill; p 9)

Consequently it was argued that there should be no regulatory cap placed on absolute emissions, but rather that a set of emissions intensity standards be developed. It should be noted however that NZ ETS is not, and has never been, a true cap-and-trade scheme, as there is no regulatory cap on absolute emissions. Thus, should the Kyoto target not be met, credits may be purchased, with the only constraint being availability.

Not acting unilaterally ahead of New Zealand's trading partners was a consistent theme, and many recommendations for delayed action and the extension of concessions featured in Solid Energy's submissions on the Modified Bill (CCMOD) and ETS review #2.

The ETS should in time cover all sectors of the economy, with each sector bearing an obligation consistent with its contribution to New Zealand's net emissions deficit and its ability to contribute to reduction of this deficit.... The transition should be at a pace consistent with our trade competitors and partners. (CCBill, p 6)

Delayed entry of four sectors into the ETS, and delayed phase out of free allocations was suggested. It was also argued that the transitional phase should be extended, that ETS review #2 be delayed and that the Climate Change Act should be amended to provide for a domestic ETS scheme only. It was strongly argued that New Zealand should be allowed to increase its per capita emissions on account of our key role as food producers in a time of increasing global demand (ETS #1; p 8; see also CC Bill). Other policy positions advanced were: a) that a linear phase-out of free allocations should not occur; b) that a pool of credits should be made available to new entrants into the economy; and, c) there should be a transitional cap on the price of carbon.

5.3.5 *Technical arguments*

Technical fixes to the GHG problem were considered essential. The position of the IPCC (2005) that carbon capture and storage (CCS) would be a key element in climate change mitigation was repeated and its deployment anticipated.

The IPCC recognises carbon capture and storage as a key component of any climate change solution. The Bill does not provide adequately for CCS as an acceptable mitigation option. (CC Bill; p 10)

Solid Energy has invested significantly in CCS research, notably a storage trial in a depleted Australian natural gas field (Page et al., 2008) and has indicated that CCS may be used on its proposed lignite processing operations (Solid Energy, 2012). Technical fixes for GHG emitting processing industries and for animal agriculture, were however deemed to either be insufficient at present or not to exist, and a need for breakthrough technology was stated.

[The assumption that] We could expect to decouple economic growth from increased energy usage and greenhouse gas emissions [is incorrect]. No other economy has managed this and without breakthrough technology it is unlikely in the foreseeable future. (ETS #1, p 2)

Ambitious targets for emissions reduction will only be achieved if breakthrough technologies become available at low carbon prices. (ETS #1, p 8)

5.3.6 *Consultation process*

Solid Energy considered that the consultation process was inadequate and that more time and analysis was required on a number of issues, including fugitive emissions from coal mining and a proposed moratorium on new fossil-fuelled electricity generation. For example:

The NZ ETS development timeline has been extremely short. The lack of detailed and appropriate consultation during the development phase, followed by late amendments to the legislation and an aggressive implementation timeline results in an NZ ETS that though legislated is unworkable from a business perspective. (ETS#1, p 16)

We recommend that: S161C of the Moderated Bill be amended to make it clear that substantive consultation should take place around all parts of the process of establishing eligibility, emissions intensity and the allocative baseline. (CCMOD, p 8)

6. Discussion

The central position advanced by Solid Energy was that global agreement on emissions control is a necessary precursor to the implementation of controls, including economic instruments such as an ETS, by New Zealand. If New Zealand acts unilaterally, then emissions leakage will occur, and our economy will suffer, creating a lose-lose situation. Furthermore we are special, since much of our economic activity produces food, a commodity increasingly in demand internationally. Thus pending global agreement, New Zealand should allow gross emissions to increase, pursue emissions intensity standards, and rely on bio-sequestration, CCS and carbon credits to meet any internationally agreed constraints on net emissions e.g. Kyoto. A lower-carbon economy should be pursued, by inference, following a global agreement. We now examine these arguments.

Emissions leakage across national borders arising from unilateral action by nation states is a well-recognised generic concern, and has been widely discussed since the signing of the United Nations Framework Convention on Climate Change (UNFCCC) (Monjon and Quirion, 2011a). However the modelling literature is divided as to the extent of likely impacts and empirical evidence is sparse. The IPCC estimated that 15-20% leakage was likely, based on observed national climate policies, but there is presently no clear consensus on the size of long-term leakage effects, due to the relatively low price of carbon (Gonzalez-Eguino et al., 2012). Several economic modelling studies have indicated that carbon leakages are likely to be small or non-existent e.g. (Flachsland et al., 2011; Peters et al., 2011; Burniaux and Martins, 2012; Wrake et al., 2012). Emissions reductions within the EU of 25% by 2020, with 12% leakage to the rest of the world were predicted by Eskeland et al. (2012) using a general equilibrium economic model. Spassov (2012) pointed out the wide range in the modelled results and also stated that no actual leakage from the EU has been detected to date. Wrake et al. (2012) argued against the suggestion that a cap on European emissions would increase global emissions, stating that this was not supported theoretically or empirically, but with the caution that it was early days yet. Peters et al. (2012) suggested that factors unrelated to climate policy have been responsible for emissions transfers to date. It was argued by Burniaux and Martins (2012) that small leakages could in fact encourage “the formation of a worldwide coalition to stabilise climate change”. There is however good empirical evidence of emissions leakage arising from state and regional emissions trading schemes in the USA (Sovacool and Brown, 2009; Carley, 2011; Goulder et al., 2012). Recognising that international emissions leakage may be a future concern, and after arguing the ineffectiveness of free allocations and financial compensation to at-risk sectors, Spassov (2012) has proposed border adjustment measures as a best means to curtail future carbon leakage (see also Monjon and Quirion (2011a,b)).

A related phenomenon to leakage is the export of emissions intensive activity to other countries, on whose GHG balance sheets those emissions then appear instead, and importing the products. Thus one country may reduce its own emissions, even though global emissions remain unchanged, or increase. Analysing the performance of the first phase of the Kyoto protocol, Aichele and Felbermayr (2012) concluded that the domestic emissions reductions in committed countries of 7% had been negated by increases in imported over domestic emissions of approximately 14%. It has been argued by Sovacool and Brown (2009) and Sovacool (2011) that both geographical leakage due to physical relocation, and technological leakage, whereby firms invest revenues from the EU-ETS in fossil fuels, and GHG emitting

activities, have occurred, and these authors propose that only a global agreement will be successful at lowering GHG emissions.

Thus in respect of the emphasis on international emissions leakage put forward by Solid Energy, whilst this is a legitimate concern in principle, the likely impact appears to be relatively small. We note that Solid Energy did not support its position on emissions leakage with any evidence. Many other factors have been reported to drive industry relocation, including capital intensity (Pinkse and Kolk, 2009) and these authors have suggested that “relocation is more regularly used as a threat that is not carried out subsequently”. Looking to the future, given that border adjustment measures are under active consideration, the position advocated by Solid Energy may work against New Zealand in the long term.

Reliance on carbon sinks to meet net emissions agreements, whilst continuing with business-as-usual, or higher, levels of fossil fuel consumption, raises several issues: a) the capacity and permanence of bio-sequestration and CCS; b) the potential for perpetuation of carbon lock-in; c) impact on international credibility. Solid Energy has proposed planting 1 million hectares of New Zealand in exotic and indigenous vegetation over 20-30 years. *Pinus radiata* is an exotic species which grows well in New Zealand, and stores 550-920 tCO₂/ha in above ground biomass at maturity (30 years) (Ministry for Primary Industries, 2012). Thus 550-920 MtCO₂ would be stored over the next 30 years if all plantings were to commence immediately. This would conservatively allow New Zealand’s gross emissions to grow at 18.3 Mt/y on average - assuming 550 Mt over 30 y – if the present Kyoto target remained. Alternatively it would result in an average surplus of 18.3 Mt/y, should net emissions remain constant. However, any reductions in the target below the existing Kyoto commitment would be limited to 34.3%, provided the new plantings were additional to existing ones and not required to replace the latter. However this scenario is unlikely to be the case since a large proportion of New Zealand’s exotic forests will mature over the next 5-7 years and there are few incentives to replant. In addition, there are considerable uncertainties around forest and land use change measurements, plus “room for creative accounting” e.g. Levy and Egan (2003), making this approach less robust than reduced fossil fuel consumption. Sequestration using indigenous plantings will be less. Carbon capture and storage is suited only to large stationary sources of CO₂ and relies on suitable geological formations being available. We consider it unlikely that CCS will play a significant role in New Zealand with respect to coal, given the present minor amount of coal-fired electricity generation and the earthquake prone nature of the country. Finally, a 34.3% reduction compares unfavourably to the present New Zealand government’s aspirational target of 50% by 2050, and to wider calls for from developed countries such as NZ to make 80-90% reductions.

The strategy proposed by Solid Energy also risks prolonging carbon-lock-in (Unruh, 2000; Unruh, 2002) both by diverting resources from the implementation of renewable energy technologies, and delaying the associated conversion of infrastructure such as electricity transmission lines or electric vehicle charging arrangements. In terms of international reputation, it does little to enhance the position of New Zealand. Should border adjustment mechanisms become a reality, New Zealand may be seen as a country relying on a limited, “waste treatment-based”, approach to carbon pollution, rather than one attempting to reduce the use of fossil fuels over the long term. Solid Energy has publicly stated that “Over time, New Zealand will eventually move to more sustainable forms of energy” (Elder, 2012) and has supported addressing the transition to a low-carbon economy: viz. “The Bill should address...how to: Transition to a low carbon economy by mid century or earlier, at least cost” (CCBill, p8). It should be noted that ‘low-carbon economy’ means low net emissions – so provided carbon sinks, including CCS, are adequate this does not necessarily imply, or indeed require, reduced fossil fuel consumption. However, the proposed strategy contains no analytical details on the timeframe, or on how any transition should commence. In fact the

CEO goes on to state “But coal is still, and will be for some years, one of the most cost-effective options for generating electricity and for powering our industry” (Elder, op. cit.). Furthermore, the company is continuing with coal mining, including plans to use vast lignite reserves for the production of briquettes, diesel fuel and urea fertiliser. Whilst it proposes to capture a proportion of diesel and urea process emissions, which will be buried using CCS, with bio-sequestration used for any remainder in excess of allocations, there is no known technology for capturing end-of-pipe and in-field emissions from the use of these products.

Reliance on intensity standards rests on unstated, but implicit, assumptions that: a) other countries would agree to allow New Zealand special dispensation on account of its greater emissions efficiency; and, b) production at locations overseas would continue to remain less emissions-efficient than production in New Zealand for the foreseeable future. No information was provided on how far away other countries are from meeting the New Zealand standards, and there was no discussion on what happens when they reach the same level of emissions intensity as New Zealand producers.

Examination of Solid Energy’s stance shows a clear commitment to ecological modernism, with the CEO implying that a win-win situation for the coal industry is possible:

Energy underpins economic prosperity and social wellbeing. Supply of secure, affordable energy is increasingly one of the greatest challenges facing the world and coal is an increasingly critical component of the supply mix, but also must rise to the challenge of supporting environmental sustainability. (World Coal Institute, 2008)

The high degree of political involvement demonstrated by Solid Energy is consistent with previous findings e.g. Haigh (2008); Pinkse and Kolk (2009). An interesting additional element in the present case however is that Solid Energy was a wholly government-owned corporation during the submissions period, with a Minister of State Owned Enterprises as the sole shareholder and recipient of dividends paid to the government. Notably the corporation argued not only in its direct interests, but also on matters of national policy, and, as observed by Haigh (2008) for participants in the Australian electricity industry, it lobbied both directly and through industry associations. It also lobbied to weaken policies promoted by its sole shareholder. Whilst this may be regarded as potentially problematic, State Owned Enterprises have the primary objective of operating as successful businesses in a commercial sense, with most functioning in deregulated markets on equal terms with private sector businesses (SSC, 2011). Thus it may not be unexpected for these enterprises to behave in a similar manner to private sector organisations seeking to maximise financial gain. Further research is required to determine whether tension between policy promotion, and the expectation of a financial dividend, has existed on the part of the sole shareholder.

In relation to legitimacy, Solid Energy’s position can be viewed in both positive and negative terms. On the positive side of the ledger, it has not contested anthropogenic climate change and has stated that genuine emissions reductions at a global level are required; thus it is not a climate change denier, nor an uncritical participant. It produced policy arguments that unilateral action by New Zealand at this time is counter-productive in relation to global emissions and thus it portrayed itself as an organisation seeking genuine results. It argued that our role in global food production requires special exemption, because the world is demanding food. In proposing to expand into lignite mining and convert lignite to diesel fuel and urea fertiliser it has argued that this will be “better for the planet” since this activity will substitute for imports and thus reduce shipping emissions. Solid Energy has further stated that these lignite conversion processes will be legally compliant in respect of emissions, and that it does not seek any free GHG allocations for these activities. Solid Energy also has investments, albeit minor, in bio-diesel and wood pellet production. On the negative side of the ledger, no analysis of, or evidence for, emissions leakage was provided in the submissions; leakage was simply presented as an inevitable fact. This may open the

corporation to allegations that leakage was used as a threat, rather than a warning of real substance. In relation to food production, the major sources of agricultural emissions in New Zealand are from dairy, meat and wool production; which represent a sub-set of food production, not its entirety. No analysis of low-GHG food crop alternatives for New Zealand was presented, which in view of the widespread recognition that meat production is a major global source of GHGs, is significant. In arguing for special dispensation for New Zealand, Solid Energy failed to address the political likelihood of this happening, and the prospect that a number of other countries will also argue that they have special circumstances which should release them from certain climate change obligations. In relation to claims that local processing of lignite is better for the planet, the shipping component is miniscule in relation to emissions from product usage, and any such reduction would rely on the unlikely event of that vessel not undertaking an equivalent journey anywhere else in the world. This opens the corporation to potential allegations of greenwash and trivialisation. Solid Energy has lobbied extensively to create a weak regulatory regime, which may be seen as damaging from a legitimacy perspective, although this should also be considered in light of the core belief that a unilateral ETS is a poor and potentially damaging economic instrument for New Zealand. Finally, plans to continue with coal mining, including the lignite developments, prolong carbon lock-in, and if not inhibiting change, will do nothing to encourage it. On balance therefore, we conclude that whilst Solid Energy has established a prima facie case for enhanced legitimacy as a good environmental citizen, this does not stand up to a more detailed scrutiny in light of the literature, and of calls for urgent action on climate change.

The policy and arguments put forward by Solid Energy on climate change and emissions trading suggest a new category in addition to those in existing typologies of corporate and business responses. The climate science was accepted, the need for transition to renewable energy was acknowledged in principle and an intelligent critique of unilateral action was made. However, the reliance on sinks, lack of attention to carbon lock-in and the failure to address net emissions reduction beyond Kyoto levels are not captured by the “proactive” and “active” categories of van den Hove et al. (2002) and Jeswani et al. (2008). Accordingly we propose a “proactive conservative” category to describe this type of response.

7. Conclusions

Submissions on climate change legislation and emissions trading developments in New Zealand from a major New Zealand fossil fuel company over a four-year period contained positions and arguments able to be categorised into five groupings: general principles on climate change, economic issues, policy issues, technical issues and consultation process issues. Action on climate change and emission trading were supported in principle, but unilateral implementation of emissions trading ahead of trading partners was opposed. A notable alternative position on emissions control was proposed, pending global agreements and a mature carbon market, in which it was argued that New Zealand should increase gross emissions and thereby grow its economy, whilst relying on carbon sinks and cheap AAUs in order to meet any internationally agreed net emissions targets. Emissions leakage was cited as an inevitable consequence of emissions trading ahead of others, although no supporting evidence was presented. Emissions intensity targets were proposed, rather than a cap on absolute emissions, and the emissions efficiency of New Zealand industries was used to justify increased production, particularly of food, in New Zealand, in preference to elsewhere. A strong belief in continued economic growth and the need for technical fixes to reduce emissions from a perceived continuation of existing economic activities were revealed. The consultation process was considered unsatisfactory.

Legitimacy was potentially enhanced though the company's acceptance of the climate science, support for policies which would deliver genuine global emissions reductions and an intelligent critique of unilateral action on climate change. However, this was countered by the evidence on emissions leakage, the focus on a sub-set of food production, a failure to address the likely political realities of special pleading, extensive lobbying to create a weak regulatory regime in New Zealand, the limited capacity of forestry sinks, and ongoing plans for expansion of fossil fuel production. A new typology of "proactive conservative" is proposed to describe this type of response.

Acknowledgements

The authors gratefully acknowledge financial support from the Marsden Fund, administered by the Royal Society of New Zealand.

References

- Aichele, R. and Felbermayr, G., 2012. Kyoto and the carbon footprint of nations. *Journal of Environmental Economics and Management* 63 (3), 336-354.
- Bruton, G.D., Ahlstrom, D. and Li, H.L., 2010. Institutional Theory and Entrepreneurship: Where Are We Now and Where Do We Need to Move in the Future? *Entrepreneurship Theory and Practice* 34 (3), 421-440.
- Burniaux, J.-M. and Martins, J.O., 2012. Carbon leakages: a general equilibrium view. *Economic Theory* 49 (2), 473-495.
- Carley, S., 2011. Decarbonization of the US electricity sector: Are state energy policy portfolios the solution? *Energy Economics* 33 (5), 1004-1023.
- Cho, C.H. and Patten, D.M., 2007. The role of environmental disclosures as tools of legitimacy: A research note. *Accounting Organizations and Society* 32 (7-8), 639-647.
- Cho, C.H., Guidry, R.P., Hageman, A.M. and Patten, D.M., 2012. Do actions speak louder than words? An empirical investigation of corporate environmental reputation. *Accounting Organizations and Society* 37 (1), 14-25.
- Elder, D., 2012 Must use coal. *The Press*, Saturday, June 23, 2012 p A22. The Press, Christchurch, New Zealand
- Eskeland, G.S., Rive, N.A. and Mideksa, T.K., 2012. Europe's climate goals and the electricity sector. *Energy Policy* 41, 200-211.
- Flachsland, C., Brunner, S., Edenhofer, O. and Creutzig, F., 2011. Climate policies for road transport revisited (II): Closing the policy gap with cap-and-trade. *Energy Policy* 39 (4), 2100-2110.
- Gonzalez-Eguino, M., Galarraga, I. and Ansuategi, A., 2012. The future of old industrial regions in a carbon-constrained world. *Climate Policy* 12 (2), 164-186.
- Goulder, L.H., Jacobsen, M.R. and van Benthem, A.A., 2012. Unintended consequences from nested state and federal regulations: The case of the Pavley greenhouse-gas-per-mile limits. *Journal of Environmental Economics and Management* 63 (2), 187-207.
- Haigh, N., 2008. A view backstage of climate change environmental markets. *Australasian Journal of Environmental Management* 15 (2), 76-83.
- Hoffman, A.J., 2007 The coming market shift: business strategy and climate change. In: Tang, K., Yeoh, R. (Eds) *Cut carbon, grow profits: Business strategies for managing climate change and sustainability*, 101-117
- IEA. 2011. CO2 emissions from fuel consumption: highlights. International Energy Agency, Paris, France

Jeswani, H.K., Wehrmeyer, W. and Mulugetta, Y., 2008. How warm is the business response to climate change? Evidence from Pakistan and the UK. *Business Strategy and the Environment* 18, 46-60.

Jones, C.A. and Levy, D., 2007. North American business strategies towards climate change. *European Management Journal* 25 (6), 428-440.

Kolk, A. and Levy, D., 2001. Winds of change: corporate strategy, climate change and oil multinationals. *European Management Journal* 19 (5), 501-509.

Kolk, A. and Pinkse, J., 2005. Business responses to climate change: Identifying emergent strategies. *California Management Review* 47 (3), 6-20.

Levy, D.L. and Egan, D., 2000 Corporate political action in the global polity: national and transnational strategies in the climate change negotiations. In: *Globalisation and non-state actors*. Higgott, R., Underhill, G., Beiler, A. (Eds), Routledge, London, UK, 138-153

Levy, D.L. and Egan, D., 2003. A Neo-Gramscian approach to corporate political strategy: conflict and accomodation in the climate change negotiations. *Journal of Management Studies* 40 (4), 803-829.

Levy, D.L. and Jones, C.A., 2006 U.S. Business Strategies and Climate Change. In: *Climate Change Politics in North America: The State of Play*, H. Selin and S. VanDeveer, eds., Canada Institute Occasional Papers #2., 173-190

Mason, I.G. and Ball, A., 2008. An analysis of the role of the carbon neutral public sector in reducing greenhouse gas emissions in New Zealand. In: *Proceedings of the NZ Society for Sustainability Engineering and Science Conference "Blueprints for a Sustainable Future"*, 9-12 December, 2008, Auckland, New Zealand.

MfE. 2002 CAB(072) 26/16 - Climate change 1: confirmation of preferred policy package. NZ Government, Wellington, New Zealand

MfE. 2005 CBC min (05) 20/10 - Climate change: review of policy and next steps. NZ Government, Wellington, New Zealand

Ministry for Primary Industries. 2012 Carbon sequestration rates. Available at: <http://www.mpi.govt.nz/forestry/funding-programmes/permanent-forest-sink-initiative/carbon-sequestration-rates>

Accessed: May, 2012

Monjon, S. and Quirion, P., 2011a. Addressing leakage in the EU ETS: Border adjustment or output-based allocation? *Ecological Economics* 70 (11), 1957-1971.

Monjon, S. and Quirion, P., 2011b. A border adjustment for the EU ETS: reconciling WTO rules and capacity to tackle carbon leakage. *Climate Policy* 11 (5), 1212-1225.

NZ Government. undated New Zealand Legislation. Available at: <http://www.legislation.govt.nz/default.aspx>; accessed 2008, 2009, 2010, 2011, New Zealand Government, Wellington, New Zealand

Page, S.C., Mason, I.G. and Williamson, A.G., 2008. Carbon Capture and Storage: An applicable technology for New Zealand? In: *Proceedings of the NZ Society for Sustainability Engineering and Science Conference "Blueprints for a Sustainable Future"*, 9-12 December, 2008, Auckland, New Zealand.

Patten, D.M., 1992. Intraindustry Environmental Disclosures in Response to the Alaskan Oil-Spill - a Note on Legitimacy Theory. *Accounting Organizations and Society* 17 (5), 471-475.

Peck, P., Bennett, S.J., Bissett-Amess, R., Lenhart, J. and Mozaffarian, H., 2009. Examining understanding, acceptance, and support for the biorefinery concept among EU policy-makers. *Biofuels Bioproducts & Biorefining-Biofpr* 3 (3), 361-383.

Peters, G.P., Minx, J.C., Weber, C.L. and Edenhofer, O., 2011. Growth in emission transfers via international trade from 1990 to 2008. *Proceedings of the National Academy of Sciences of the United States of America* 108 (21), 8903-8908.

Peters, G.P., Marland, G., LeQuere, C., Boden, T., Canadell, J.G. and Raupach, M.R., 2012. Rapid growth in CO₂ emissions after the 2008-2009 global financial crisis. *Nature Climate Change* 2, 2-4.

Pinkse, J. and Kolk, A., 2009. *International business and global climate change*. Routledge, Abingdon, UK

Reid, E.M. and Toffel, M.W., 2009. Responding to Public and Private Politics: Corporate Disclosure of Climate Change Strategies. *Strategic Management Journal* 30 (11), 1157-1178.

Scott, W.R., 2008. *Institutions and Organisations: Ideas and Interests*. Sage Publications, Los Angeles, USA

Solid Energy. 2012 Lignite and carbon emissions. Available at: <http://www.solidenergy.co.nz/index.cfm/1,485,0,0/Lignites-and-Carbon-Emissions.html>
Accessed: September, 2012

Sovacool, B.K. and Brown, M., 2009. Scaling the policy response to climate change. *Policy and Society* 27 (4), 317-328.

Sovacool, B.K., 2011. The policy challenges of tradable credits: A critical review of eight markets. *Energy Policy* 39 (2), 575-585.

Spasov, Y., 2012. EU ETS: Upholding the Carbon Price Without Incidence of Carbon Leakage. *Journal of Environmental Law* 24 (2), 311-344.

SSC. 2011 State Owned Enterprises Act 1986. Available at: <http://www.ssc.govt.nz/node/8407>
Accessed: 4 October, 2012, State Services Commission, Wellington, New Zealand

Unruh, G.C., 2000. Understanding carbon lock-in. *Energy Policy* 28 (12), 817-830.

Unruh, G.C., 2002. Escaping carbon lock-in. *Energy Policy* 30 (4), 317-325.

van den Hove, S., Le Menestrel, M. and de Bettignies, H.C., 2002. The oil industry and climate change: strategies and ethical dilemmas. *Climate Policy* 2 (1), 3-18.

Weinhofer, G. and Hoffmann, V.H., 2010. Mitigating climate change - how do corporate strategies differ? *Business Strategy and the Environment* 19 (2), 77-89.

Wood, A., 2010 'There's a lot of coal at Stockton, maybe 20 years'. *The Press*, Christchurch, New Zealand; 10 February, 2010

World Coal Institute. 2008 World Coal Institute elects new chairman. <http://www.worldcoal.org/resources/archived-news/world-coal-institute-elects-new-chairman/>

Wrake, M., Burtraw, D., Lofgren, A. and Zetterberg, L., 2012. What Have We Learnt from the European Union's Emissions Trading System? *Ambio* 41, 12-22.