Adrian Macey

Climate Change towards policy coherence

The fifth assessment report of the Intergovernmental Panel on Climate Change, being released in sections from late 2013 through 2014, is rekindling public interest in climate change. With controversies over the previous report (2007) out of the way, advances in knowledge since then and some improvement in procedures, the findings of the latest report appear more robust. Even though many uncertainties remain, the evidence base for policy is compelling.

The report's first instalment – from working group I on the physical science – has two highly relevant insights for policy. First, limiting global warming is at its centre a problem of cumulative gases (those with a long lifetime in the atmosphere), principally carbon dioxide from fossil fuels, of course, but also some others, including nitrous oxide, which is a significant proportion of New Zealand emissions. At some point the net emissions of these gases will need to approach zero. Unless one believes that fossil fuels can be eliminated completely in the next few decades, this implies that negative emissions technologies, such as combined biofuel and carbon capture and storage, will have to be used during the transition. The second insight is greater confidence in mainstream estimates of global warming provided by a combination of research, observational data and models. Extreme estimates of warming, and catastrophic tipping points, while not discounted, seem less likely.

The report of working group II on impacts and adaptation has more information on New Zealand than previous reports. It describes the increased risk of flood damage from storms, and from coastal erosion due to sea level rise. It has useful information on adaptation strategies. The working group III report updates mitigation options, and importantly confirms that the pledges through the United Nations climate change negotiations so far on the table are insufficient to stabilise greenhouse gas concentrations at the desired level. It also assesses the global costs of different mitigation pathways. It demonstrates

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that the case for early action to reduce emissions remains strong.

Such insights are valuable and timely. They coincide with the negotiation of a new climate change agreement under the UN. This is to conclude at the end of 2015 and to take effect from 2020. In what may become seen as the 'post-Kyoto' period, negotiations have the potential finally to produce a truly universal climate change regime – one where, in the language of the negotiations, obligations and commitments are 'applicable to all'.[1] The IPCC's findings will help governments align their domestic and international climate change policies.

The very slow progress of the international negotiations, and other pressures, have pushed climate change down the priority list for many governments, New Zealand being no exception. In New Zealand, the twin recoveries from the global financial crisis and the Canterbury earthquakes have meant that GDP growth and reducing business costs have dominated the government's economic agenda. Doubling the value of New Zealand's agricultural exports and exploring oil and gas resources have served these policy needs, and have been pursued without attention to climate change implications, perhaps because climate change measures may appear to serve neither goal. Climate change policies have accordingly been more or less parked. But the international context now again requires states to front up with 'contributions' to the international effort, well beyond 2020 and more likely to 2030 ('contributions' is the new word found at Warsaw in 2013 in lieu of the politically-charged term 'commitments', in order to apply to both developed and developing countries). Pressures to increase ambition, especially on industrialised countries, will mean new attention has to be given to long-term domestic policies, since they are the basis for establishing and implementing international commitments.

Abroad: New Zealand and international climate change policies

New Zealand has historically had a strong voice in the UN climate change negotiations. It was prominent in the original negotiation of the Kyoto Protocol, and New Zealand ministers and officials have played influential roles at climate change conferences since then. A high point of New Zealand influence was the 2011 Durban conference, where New Zealand had a major role in two of the three key outcomes (Macey, 2012).

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There has been one recent hiccup in the otherwise positive story of New Zealand's influence on climate change negotiations. Unusually, New Zealand entered the Doha Conference of the Parties in 2012 in a weak position. It received in return a reminder that a small country will get results only so long as it is useful to others. On emissions reductions, New Zealand had – and still has – a conditional target range to reduce emissions,[2] dating back to 2009. But at Doha it was impossible to know how far these conditions would be met, and, as New Zealand had no minimum or unconditional target, it had nothing to put on the table. New Zealand could only say that it intended to take up a target under the UNFCCC – the United Nations Framework Convention on Climate Change – rather than the Kyoto Protocol, an announcement that was accompanied at home by a questionable argument that abandoning Kyoto would give New Zealand more influence in the negotiation of the new agreement. Apart from the fact that one could argue precisely the contrary, this put New Zealand's immediate negotiating objectives at risk.

Despite having no target, New Zealand sought access to the Kyoto market mechanisms. Economically and environmentally this would make sense, once New Zealand committed to a target. Developing countries would stand to benefit from offsets that they could provide under the Clean Development Mechanism. But politically this was always going to be a hard ask. Many developing countries saw denial of access to Kyoto markets as 'punishment' for abandoning Kyoto and made this plain in the early days of the Doha conference, as indeed they had earlier in the negotiations.

New Zealand went to the Doha conference with nothing to offer in return for access to Kyoto markets: not only had it no target to inscribe in the annex of commitments ('qelros'), but neither could it commit to supporting the new Kyoto rules it had spent years negotiating. So New Zealand was rebuffed. It was symptomatic of this loss of influence that, in contrast with the year before, New Zealand's two ministers were almost invisible at this conference.

The result was to shut New Zealand out of UN carbon markets from 2013,[3] apart from wash-up accounting for the Kyoto Protocol's first commitment period, which extends to 2015. This leaves New Zealand in the period after the expiry of the Kyoto Protocol's first commitment period until the coming into effect of the new, yet to be negotiated agreement in potential limbo. It is at odds with New Zealand's strong advocacy of markets in the negotiations, and has had consequences at home and abroad. Among New Zealand's negotiating partners there were reactions of both irritation and puzzlement, all the more so since Australia had decided to go with the Kyoto Protocol and had a firm unconditional target. There was particular irritation within the EU that New Zealand was walking away from the rules package on the land sector (LULUCF: land use,

land-use change and forestry), where it was felt many concessions had been made towards New Zealand's interests around plantation forestry.

The root of New Zealand's ill-preparedness for Doha was less the international policy settings *per se* than neglect of domestic policy. New Zealand had not done the work to establish an interim unconditional emissions reduction target, and had not decided which accounting rules it would adopt, notably on forestry. These two factors precluded being part of the Kyoto Protocol's second commitment period, which, from a practical point of view, would have been the simplest option. Ironically, several months after the conference New Zealand came up with a modest unconditional 2020 target of 5% below 1990 levels, plus a decision to use the renegotiated Kyoto accounting rules. So, effectively New Zealand will subject itself to Kyoto disciplines up to 2020 with its target, but will receive none of the benefits of its flexibility mechanisms. This potentially limits the ambition of New Zealand's final 2020 commitment, if it is to move into the conditional range of 10–20% below 1990 levels.

The setback at Doha has thus had an impact at home, but it has not prevented New Zealand from working constructively in the international negotiations, as well as on other initiatives. Current themes that New Zealand pursues in the international negotiations are carbon markets, agriculture and rules for the land sector, as well as the structure of the agreement and the form of commitments under it (New Zealand Government, 2013b).

Outside the UN negotiations, New Zealand is promoting the removal of inefficient subsidies on fossil fuels,[4] and has initiated the Global Research Alliance[5] on agriculture and climate change, which now involves 40 countries, both developed and developing. New Zealand also set up the Asia–Pacific Carbon Markets Roundtable which is exploring the potential for a regional carbon market (Ministry for the Environment, 2013b, p.215). It has joined the Climate and Clean Air Coalition (CCAC),[6] which focuses on short-lived climate pollutants such as methane and black carbon. New Zealand also has a well-directed aid programme on climate change to help Pacific Island countries, with a focus on renewable energy. Finally, it is a tribute to the international reputation of climate change minister Tim Groser that New Zealand is invited to the 'top table' of the Major Economies Forum on Energy and Climate (MEF), a grouping of the world's largest economies, and hence largest greenhouse gas emitters.[7] It is self-evidently the countries in this group that will determine the success or failure of efforts to limit global greenhouse gas emissions, so New Zealand is in an excellent position to have influence.

Such initiatives outside the UN are one aspect of a shift in how many governments are thinking about climate change policies. First, they are looking at international cooperation well beyond the UN agreements. The second and more important aspect of the shift relates to domestic policies. Earlier, and especially before the Copenhagen conference in 2009, the international negotiations were the impetus for domestic mitigation policies. Emissions reductions at home were needed, it was explained, to meet future commitments abroad. But the international negotiations are now much less the reference point for domestic mitigation policy. In the face of increasingly robust science, governments and businesses are thinking more – and for diverse reasons – about how they engage in the global transformation away from reliance on fossil fuels: in other words, how they 'decarbonise' their economies. South Korea, for example, has seen economic advantages for itself in clean technologies, and is host to the new Global Green Growth Institute.[8] Other factors, such as health and energy security concerns, push in the same direction, as is seen by China's large deployment of renewable energies and action to cap emissions from fossil fuel electricity generation plants.

The domestic aspect of this shift is not yet well reflected at government level in New Zealand, where the orientation of climate change policy remains 'neither lead nor lag' and 'fair share' (see, for example, Smith, 2011; Groser, 2014b).[9] Such concepts are a signal about international burden-sharing, and give no sense of the long-term direction of domestic policy and the economy. There has been no comprehensive statement on climate change since the current government was re-elected (2011), certainly nothing comparable to US president Barack Obama's June 2013 Climate Action Plan, which demonstrates a coherent approach across three components: emissions reduction, adaptation to climate change and leadership of international efforts (Executive Office of the President, 2013).

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It should be noted that, while the UN negotiations are no longer setting the pace, they are still a necessary part of the future solution on climate change, as the latest IPCC report confirms. Common rules for reporting and accounting of emissions are needed to underpin the whole climate regime. Internationally-tabled commitments can provide the needed 'stretch' of mitigation ambition, and also ensure the effectiveness of contributions through other parts of the climate change regime, such as finance and technology transfer.

At home: the state of play of New Zealand climate change policy

In the absence of a strong national policy statement, most of the recent

government explanations on climate change have to be garnered from answers to parliamentary questions, speeches and op-eds. Taking the longer term first, New Zealand has a gazetted, non-binding, reviewable 'responsibility target'[10] of reducing emissions by 50% below 1990 levels by 2050. This dates from 2011, and was depicted as meeting the 'fair share' criterion, comparable with the targets set by New Zealand's major trading partners. Bundled together with the announcement of this target were elements of a broader, long-term orientation to come. Some other current measures were listed, and the recently-commissioned Green Growth Advisory Group was to provide further inputs into policies (Green Growth Advisory Group, 2011).

Since its introduction in March 2011, however, the 50/2050 target has received no official follow-up, and indeed is rarely even mentioned.[11] It was not included in New Zealand's list of policies in the Pacific Islands Forum's Majuro Declaration in September 2013.[12] Given that latest emissions projections are for an approximate doubling of emissions from the international reference point of 1990 levels, even with the use of markets achieving it would be a huge challenge. It would imply a much faster transformation of the New Zealand economy than anything contemplated so far. It is not clear whether this target is still officially considered achievable. If it is, it will be important to give some idea of the pathway to get there, with the policies and measures that would be used.

The government continues to promote the emissions trading scheme (ETS) as the country's primary climate change policy instrument, 'one of the very best in the world' in the words of one minister (Bridges, 2013b). There is bipartisan agreement of the two major political parties on an ETS as a core policy instrument, though increasing disagreement on its settings. The stated policy rationale of the ETS is as follows:

> The Government has chosen the New Zealand Emissions Trading Scheme (ETS) as its primary tool to reduce emissions, as it is the least-cost way of reducing emissions. The NZ ETS puts a price on emissions and therefore creates a financial incentive for all New Zealanders – especially businesses and consumers – to change our behaviour. The NZ ETS provides an incentive to:
>
> - reduce emissions
> - invest in clean technology and renewable power generation, and
> - plant trees.[13]

The rationale of carbon pricing in New Zealand is explained as: 'we are committed to doing our fair share. That means working at not trying to have policy settings above *the* international price'

In addition to these policy objectives, there are other claims, including that 'the NZ ETS will strengthen the country's clean green brand'.

With its current settings and in the current international context, the ETS is doing none of these things,[14] and indeed by 2013–14 was probably encouraging more tree felling than tree planting. While from a pure accounting and compliance point of view a low price is simply a market issue, achieving these policy objectives is not. Similarly, in the farming context, the rewards for lower emissions practices being followed by some farmers are all the smaller in the absence of an effective carbon price. So the most important features of the ETS which should advance the long-term transformation of the New Zealand economy are prejudiced by the cheap carbon price, since they reduce incentives to close to zero.

Since its original design – a world-first, all-sector all-gases scheme – the ETS has been weakened by the continued non-inclusion of agriculture and the softening of settings – for example, the continuation of the 'one for two' transitional measure[15] – compounded by the collapse in carbon prices. The fundamental design of the ETS is not the issue, with one exception. The 100% exposure to the international market has allowed the cheapest carbon units, of whatever quality, to enter the New Zealand system. Over 70% of the units surrendered in 2012 were ERUs (emission reduction units),[16] and in all 82% of the units that year were from offshore carbon markets. ERUs are certainly cheap: less than 10% of the price of the already low New Zealand units (NZUs). They are overwhelmingly of Russian and Ukrainian origin, and are of dubious environmental integrity, thus creating a potential risk to the New Zealand brand – so much so that there is anecdotal evidence that some businesses are opting not to use them.[17]

In the world of carbon markets the adage 'a tonne is a tonne is a tonne' does not hold. There is no single 'international price' because carbon is not a fully internationally traded single commodity, like milk powder. There is a wide range of prices, because neither all units nor all markets are comparable. In April 2014, for example, carbon prices in the main markets in Europe, the US and China were between $NZ5 and $12. Quality also varies, from units of high environmental integrity to those of an environmental equivalent of junk bonds. It is notable that in the first biennial report required by the UNFCCC the government is coy about the units in its registry, on the grounds that units held but not yet surrendered to the UNFCCC do not need to be disclosed (Ministry for the Environment, 2013a).

The unconstrained access to international carbon markets risks being inconsistent with the Kyoto Protocol, which states that use of flexibility mechanisms is to be 'supplemental' to domestic action.[18] This was never quantified as a percentage, but it was further specified in a decision that domestic action must be a 'significant element' of the effort made by each Annex I party.[19] This is consistent with the concept of a global transformation towards low-carbon economies rather than paying to pollute. A case could be made that New Zealand's ETS failed this

supplementarity test during the first Kyoto commitment period.

The rationale of carbon pricing in New Zealand is explained as: 'we are committed to doing our fair share. That means working at not trying to have policy settings above *the* international price' (Bridges, 2013a, emphasis added). A typical response to criticism of the low carbon price is as follows:

> Markets go up; markets come down … I think it is extremely unlikely that in 27 years, carbon prices – which have got nothing to do with the New Zealand emissions trading scheme; they are all influenced by the international price – will be sitting around the current extraordinarily low levels. (Groser, 2014a)

The implication of these comments is that the rising international price will provide the incentive to reduce emissions. This suggests that the pace of New Zealand's emissions reductions will be determined by the vagaries of international markets. Complete dependence on international markets was never the intention of the ETS, since it has built-in safeguards against a too-high international price, through a price ceiling of $25 a tonne. What is lacking is a price floor as a domestic policy lever and a low-carbon transition tool consistent with the stated objectives of the scheme. As of the first quarter of 2014, New Zealand's net accounting position under the Kyoto Protocol was using a price of 30 cents a tonne, and NZUs were around $3.00. Foresters and iwi have asked for a price floor of $15. The government has rejected such ideas, arguing that at a time of economic fragility such measures would raise costs to New Zealand consumers.

It could be argued that under the original design of the ETS, covering almost 100% of New Zealand emissions, it was appropriate to use it as a single instrument of climate change policy, neutral across all sectors. In this case, with a carbon price potentially through the whole economy, complementary measures would be less necessary. Contrast this with the EU ETS which covers only around 45% of EU emissions. But with the indefinite exclusion of agriculture – just under half of New Zealand's emissions under the present accounting rules – this question is no longer relevant. The New Zealand ETS at around 54% does not cover much more of the economy than its EU counterpart.

New Zealand's ETS settings have created winners and losers: winners in the livestock sector, the most emissions-intensive of agriculture; and losers in forestry, other less greenhouse gas-intensive land sector uses, and also to some extent the rest of the economy, which has to bear the costs of the 46% of emissions that are outside the ETS but within New Zealand's international target. The ETS settings have encouraged arbitrage – liquidating deforestation obligations at an insignificant price per tonne through purchasing ERUs, holding on to NZUs in the expectation that they will eventually increase in value, and converting to dairy with a consequent increase in emissions, which do not have to be paid for.[20] This could be seen as a domestic form of the carbon leakage that the government argues will be the case internationally if New Zealand puts a price on emissions where other countries don't.[21]

Under this combination of price factors and settings, the ETS appears to have led in the opposite direction to that of the intended policy, and is most likely to delay New Zealand's transition to a low-carbon economy. Getting offside with the sector on which New Zealand is relying, in all scenarios, to meet future commitments on mitigation is unfortunate. This is the second time that foresters have been disaffected, the first being towards the start of Kyoto's first commitment period, when many forests were felled owing to uncertainty and to avoid future liabilities. Planting picked up again as the government provided more certainty about the period 2008–12. Currently timber is profitable for foresters but carbon is not. While the government has blamed foresters for not reading the market better (Groser, 2014a), another specifically New Zealand dimension of the problem is the complaints from iwi who have lost an estimated $600 million value from the trees on land they were given in settlements under the Treaty of Waitangi (Turia, 2014).[22]

The latest 'snapshot' of greenhouse gas emissions and the Kyoto accounting position for 2008–12 shows both an increase in emissions, running at 25% above the 1990 level, and a net surplus under Kyoto owing to holdings of forestry and Kyoto units (Ministry for the Environment, 2014). In fact, the expected surplus is very close to the Kyoto units held (90 million). As in the first biennial report, there is no breakdown of these units. It is likely that many of these units will displace NZUs and New Zealand AAUs (assigned amount units), which can be carried over into the next period, whereas Kyoto's flexibility mechanism units can't. However, it is also clear from this report that emissions from agriculture (owing to dairy expansion) and transport are on a rising trend, partly offset by improvements in emissions intensity. This latter trend is a co-benefit, driven by improvements in production efficiency (Clark, Aspin and Reisinger, 2014); it is not attributable to climate change policies or measures.

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stockpiled NZUs/AAUs will reduce incentives for transformation during the next commitment period. In this context it is notable that New Zealand's partly government-sponsored premier annual primary industries conference in May 2014 focused largely on the goal of doubling the value of agriculture exports. There was no mention in the prospectus for the two-day programme of sustainability, future energy sources or climate change.[23]

For the sake of completeness, mention should be made of other government policies and measures, which include sectoral measures in energy, energy efficiency, housing and transport. A full listing of these complementary measures is in New Zealand's sixth national communication. These measures appear somewhat piecemeal and overall are not yet strongly coordinated or coherent with the ETS.

The absence of a long-term vision, or a meaningful carbon price, together with piecemeal complementary measures has created a policy vacuum which could delay New Zealand's transformation, and make it harder to make an internationally credible contribution to global emissions reduction. It also potentially stifles low-carbon investment, given that there are no clear signals to business.

To help fill this vacuum some initiatives have sprung up outside or alongside government. The economic consultancy Motu is running a new research programme called Shaping New Zealand's Low-Emission Future: making the NZ ETS effective.[24] Business New Zealand has absorbed the functions of the moribund New Zealand Business Council for Sustainable Development, which has been merged with Business New Zealand's Sustainable Business Forum and reconfigured into the Sustainable Business Council.[25] The Sustainable Business Council is now working with business on climate change and sustainability. The private sector-led Pure Advantage group, while it has not attracted the bulk of mainstream business, strongly advocates the benefits to New Zealand of green growth.[26] Meanwhile, opposition parties and environmental and youth NGOs continue to push for more government action on climate change.

Achieving coherence

International and domestic policies are both internally incoherent and inconsistent with each other. In order to regain coherence, and steer New Zealand through the coming global transformation, there are some obvious steps that can be taken.

A virtuous circle on agriculture might be achieved at home, with action to price or regulate nitrous oxide – the cumulative gas of the two principal agricultural ones – with benefits of both lower emissions and cleaner water.

First is a statement which shows a shift from compliance and burden-minimisation to economic transformation. Rather than the present government line of waiting to see what the major players do, this could convey an informed vision of the place of the New Zealand economy in a lower-carbon world and how that transformation can be managed. It would logically focus on opportunities for New Zealand, and at the very least could put forward 'no regrets' pathways on which some progress could be made independently of the state of international action. An emphasis on the long-term orientation of this transformation rather than attempting to pick winners through a single prescription would be most effective. Such a long-term view may require revision of the 2050 target, and/or some idea of a strategy to achieve it.

The 2011 Green Growth Advisory Group report was a lost opportunity for policy coherence, since it has received no formal government response. The report contained a modest set of recommendations, but importantly endorsed the idea of the inevitable transformation towards low carbon growth.[27] It covered broader sustainability issues beyond climate change, for example in recommending a 'conversation' about mining. The global transformation to clean energy will not mean early extinction of fossil fuels, but it will be important to understand how future potential oil and gas exploitation will factor in. What assumptions should be made about the price of carbon, and about investment in carbon capture and storage or other technologies? Is there a risk of stranded assets? How can oil and gas exploitation avoid prejudicing the 'clean, green' brand? There is a polarisation of public discussion on this important issue, between groups seeing oil and gas exploration as an absolute evil and a government view in which climate change is ignored completely in predictions of economic benefit.

Second, the fallacy of the 'international price of carbon' should be dealt to. This makes sense only when seen in narrow terms of compliance with international commitments as a financial operation. It is misleading to talk of this when there are constraints on demand for these units imposed by governments, and New Zealand is unique in having none. However, since New Zealand ETS participants have now lost their access to international units, the government may have to abandon its laissez-faire approach to the price of carbon in the period ahead. Linking with other emissions trading schemes could be one response, but would take time to negotiate. Auctioning of NZUs, which is already allowed for under the ETS, could easily be implemented. The advantage of auctioning is that the government has the scope to determine what price is best to meet the twin objectives of meeting international obligations and steering the economy through its low-carbon transition.

Third, New Zealand has the chance to advocate an approach to agriculture and the land sector that would take account of the special needs of food production

and food security, acknowledge the implications of the science regarding methane as a short-lifetime gas, and encourage optimum land use choices. This does not necessarily mean trying to renegotiate basic rules, but would certainly have the potential to recognise that agricultural methane makes a much smaller contribution to global warming than its current metric would suggest.[28] New Zealand should have high credibility here through its world-leading research on the mitigation of ruminant methane.

A virtuous circle on agriculture might be achieved at home, with action to price or regulate nitrous oxide – the cumulative gas of the two principal agricultural ones – with benefits of both lower emissions and cleaner water.[29] An even-handed approach to the different players in the land sector which treated livestock farmers the same as foresters, orchardists and others, and took account of recreation and tourism values, would be valuable. Such an approach could secure recognition of the limits to New Zealand's mitigation potential in international burden-sharing discussions, while providing an economically rational framework at home.

The whole land sector is the most complex area of the UN rules, and achieving changes will be a challenge because the major players are not demandeurs here. It will require some solid research, and New Zealand will need allies among the major agriculture-producing nations. At Warsaw in 2013 Tim Groser launched the discussion by calling for a different approach to agriculture under the UNFCCC in order to bring developing countries on board on mitigation. New Zealand's latest submission on land sector accounting (New Zealand Government 2013a) is in this regard rather general and sits on the fence on most key issues, suggesting that New Zealand thinking is not far advanced. Based on the experience of almost two decades of negotiations on LULUCF, there is very little time indeed left to negotiate rules in this highly complex area.

Fourth, to provide an updated evidence base for policy the government could commission further research: for example, on the effects of different carbon prices or of internationally-pledged reduction targets and mitigation options for New Zealand. This research could contribute to an update of New Zealand's mitigation potential, and could inform the review of the ETS in 2015.

Fifth, the government could re-engage with stakeholders, some of whom are ahead of government in thinking long-term. The private sector could assist in assessing the policy implications of market and broader 'brand' factors. Local government, too, is an important stakeholder in climate change because it bears the responsibility for adaptation, on which it has been calling for more guidance from central government. A sense of long-term direction from central government on both adaptation and mitigation would give some context for local government, supporting local autonomy without being over-prescriptive. While the main responsibility of local authorities is adaptation, some are also putting in place mitigation policies, as seen, for example in Auckland's Energy Resilience and Low Carbon Action Plan (Auckland Council, 2014). This is consistent with action being taken by major cities around the world.

Sixth, a further opportunity for inputs into policy will be the expert review under the UNFCCC of New Zealand's sixth national communication and first biennial report, which will lead to public and international scrutiny as well as the chance to judge how far New Zealand is leading or lagging. Although the new processes are untested, they should produce insights for government and stakeholders.

Apart from the land sector, where innovative thinking and research are needed, none of this looks too complicated. Moving away from fossil-fuelled energy is obvious; New Zealand has a head start here, as electricity generation is already 70% renewable and a realistic target exists to increase that to 90% by 2025. This transition is occurring even without a meaningful carbon price, so it can be assumed that it could be faster with one. Given New Zealand's geography, transport stands out as a vulnerable sector where electric and biofuel-powered vehicles and expanded public transport have potential. Progress is being made on energy efficiency. On agriculture, no government is going to send the dairy industry out of business, but it should not be too difficult to determine how far the current model is sustainable in the long term, and what policy settings are needed, taking into account other possible land uses, in order to ensure the best economic as well as environmental outcomes.

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Thus, the combination of better science, new international deadlines and increasing interest from domestic stakeholders is an opportunity to achieve both policy direction and coherence. There are choices to be made on the long-term policy direction, and on the consequent mix of price and regulatory measures that would best serve it. A renewed sense of direction at home, evidence-based policies, and a credible commitment to international efforts, including leadership in agriculture, looks like an achievable, coherent package that could be brought together during 2015.

1 For background on the recent history of international climate change negotiations, see Macey (2012).
2 10% to 20% below 1990 levels by 2020.
3 Apart from access to 'primary CERs', which is not likely to be attractive to New Zealand business.
4 See *www.mfat.govt.nz/fffsr/*.
5 *www.globalresearchalliance.org.*
6 *www.unep.org/ccac/.*
7 *www.majoreconomiesforum.org/.*
8 http://*gggi.org/*.
9 'New Zealand is doing its fair share on climate change, taking into account our unique national circumstances, both to restrict our own emissions and support the global efforts

needed to make the cuts that will limit warming', Groser stated in the government's initial response to the IPCC's working group III report.

10 See Smith (2011). The term 'responsibility target' means using a combination of domestic measures and international carbon markets.

11 There has been one recent public mention of it. It was referred to in Parliament by Tim Groser on 8 April 2014 as 'the aspirational target of 2050, when we aim to reduce emissions by 50 percent' (Hansard, vol.697, p.5).

12 http://www.majurodeclaration.org/the_declaration. The 50/2050 target was in a draft version of the annex listing measures by country, but did not appear in the final text. The target is, however, listed in New Zealand's sixth national communication to the UNFCCC (Ministry for the Environment (2013b)).

13 http://www.climatechange.govt.nz/emissions-trading-scheme/about/why.html.

14 A point made in 2011 by the Ministry for the Environment in its briefing to incoming ministers: 'While the ETS plays the core role in our response to climate change, a price alone will not be sufficient to deliver a smooth and efficient transition to a low carbon economy, particularly in the short term while the price remains comparatively low. Complementary measures will be needed to support investment in longer term abatement and infrastructure. These will likely include measures to promote technological change, innovation and behaviour change' (*http://www.mfe.govt.nz/publications/about/briefing-incoming-minister-2011/, p.20)*.

15 Emissions-intensive industries have to surrender one unit for every two tonnes of carbon. See http://www.climatechange.govt.nz/emissions-trading-scheme/ets-amendments/index.html.

16 See http://www.climatechange.govt.nz/emissions-trading-scheme/building/reports/ets-report/ets-2012-facts-and-figures.pdf. This contrasts with the first surrender period (2010), when offshore carbon markets contributed only 1.6% of units surrendered. These were all CERs from the Clean Development Mechanism. See http://www.climatechange.govt.nz/emissions-trading-scheme/building/reports/ets-report/.

17 There is a precedent for the government intervening to restrict the use of units of dubious environmental integrity in the ETS. New Zealand followed the EU and Australia in banning CERs and ERUs from HFC-23 and N^2O industrial gas destruction projects. Additional reasons for the ban were to maintain prospects of linkage with other schemes, and to avoid a price collapse in the ETS. On the reasoning behind this decision, see http://climatechange.govt.nz/consultation/hfc-23-n2o-cers/consultation-document/index.html.

18 Kyoto Protocol article 6.1 states: 'The acquisition of emission reduction units shall be supplemental to domestic actions for the purposes of meeting commitments under Article 3.'

19 Decision 2/CMP.1, para 1.

20 One of the original aims of the ETS was to slow such conversions: 'There will be a slower rate of conversion of forestry land to dairy farming as a result of applying the ETS to the forestry sector from 2008. This is likely to be the largest impact of the ETS in the short term' (http://www.mfe.govt.nz/publications/climate/framework-emissions-trading-scheme-sep07/html/page9.html).

21 The carbon leakage argument is most frequently used for agriculture, and starts from the increasing demand for animal protein. 'Any attempt to deliberately price carbon to reduce our agriculture output to make some ideological point would not only be an economic mistake of grave proportions, it would worsen the problem of global anthropogenic-induced greenhouse gas warming since the production gap would be filled by less carbon efficient producers than ours' (Groser, 2013).

22 'Some iwi were given forests as part of their Treaty settlement and these were assets with a value of between $20 and $30 per carbon credit. These credits have been reduced in value to as little as $3 per credit, therefore reducing the value of the overall settlements. The loss is expected to be in the hundreds of millions of dollars … Last month, the Government confirmed they would not intervene to put a fixed price on carbon, despite a possible $600 million Treaty claim from the Climate Change Iwi Leadership Group due to the reduced value of the carbon credits on their forests under the current failed scheme' (Turia, 2014).

23 *https://www.conferenz.co.nz/conferences/nz-primary-industry-summit*.

24 http://www.motu.org.nz/research/group/shaping_new_zealands_low-emission_future.

25 *www.sbc.org.nz/*.

26 *www.pureadvantage.org/*.

27 New Zealand's sixth national communication (Ministry for the Environment, 2013b) states that 'Aspects of greening growth have been integrated into the Government's wider Business Growth Agenda, including a commitment to transition to a low-emissions economy.' But this integration seems far from comprehensive.

28 Methane's global warming potential is 25 times that of carbon dioxide, but as it only lasts about 12 years in the atmosphere is not cumulative. A picturesque analogy to illustrate this point is made by Professor Myles Allen of Oxford University, who likens the long-lifetime gases to the turkey and methane to the cranberry sauce.

29 Agricultural nitrous oxide emissions increased almost 30% between 1990 and 2011. Fertiliser and animal excreta are the two main sources. (Ministry for the Environment, 2013b, p.56.)

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