

# **An analysis of the role of the carbon neutral public sector in reducing greenhouse gas emissions in New Zealand**

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## **Abstract**

In 2007 the New Zealand government announced systematic plans for a carbon-neutral public sector, with a commitment for six Government Departments to become carbon neutral by 2012, and for the remaining 28 core public service departments to develop plans during that period. A key reason given for adopting this strategy was that the Government wished to “lead by example”. In this paper we review of the scheme put forward for New Zealand’s government departments, examine leading by example, and look at the role of offsetting in achieving carbon neutrality targets. Inventories from the six lead agencies showed that transport accounted for the majority of departmental emissions, whilst electricity also contributed significantly, and whilst waste to landfill accounted for < 2%. Plans showed wide variability in terms of quantitative and qualitative reduction goals, and relied heavily on offsets in order to achieve carbon neutral status. Notable instances of example setting were found, but further research is required in order to assess their impact on the wider community. It is proposed that political rather than managerial leadership is required in order to achieve future deep contractions in electricity and transport emissions.

## **Introduction**

On 13 February 2007, New Zealand Prime Minister Helen Clark announced to Parliament: “I believe that New Zealand can aim to be the first nation to be truly sustainable—across the four pillars of the economy, the society, the environment, and nationhood. I believe that we can aspire to be carbon neutral in our economy and way of life.” (Clark, 2007). This vision was accompanied by systematic plans for a carbon-neutral public sector, with a commitment for six Government Departments to become carbon neutral by 2012, and for the remaining 28 core public service departments to develop plans during that period. The six lead departments selected were: the Department of Conservation (DOC); the Inland Revenue Department (IRD); the Ministry for the Environment (MfE); the Ministry of Economic Development (MED); the Ministry of Health (MOH), and the Treasury. Their selection was made on the basis of their previous data collection performance, particularly in relation to energy data, in the Govt<sup>3</sup> sustainability initiative (MfE, 2008a). Leadership and project co-ordination was allocated to the Ministry for the Environment (MfE).

A “leading by example” ethic was clearly invoked as the primary rationale for the initiative (MfE, 2007a), although it was recognised at the same time that the direct impact of public service carbon neutrality on national CO<sub>2</sub> emissions would be small at approximately 2% of New Zealand’s total emissions (MfE, 2007b). The guidelines for departments reflected the general approach espoused in the Greenhouse Gas Protocol (WBCSD/WRI, 2004) i.e. measure your emissions; reduce them as far as is practicable; and then offset unavoidable emissions. Further guidance included: a) an emphasis on mitigation prior to offsetting, b) a clear statement that some offsetting will nonetheless be required, and c) that offsetting

projects will be located within New Zealand and managed by a single agency. The need for serious attention to mitigation prior to offsetting was argued in terms of maintaining credibility (MfE, 2007b), whilst the subsequent use of offsetting was justified on the basis that 100% emissions reduction solely by mitigation measures is not considered a practical possibility, largely on account of transport issues (MfE, 2007d). The importance of achieving authentic permanent carbon sequestration (permanence) from offsetting projects was made a legal requirement (MfE, 2007c). Modelling indicated that about 6 km<sup>2</sup> of forest would likely offset departmental emissions for a period of 5 years (MfE, 2007d). The guidelines recognised the potential for conflict between carbon neutrality aspirations and conventional economic goals and also highlighted the need to identify and further investigate the threshold at which offsets become the preferred option (MfE, 2007b). Accounting requirements and independent offset project auditing were indicated (MfE, 2007c) and management structures set in place. The potential role of carbon markets and the price of carbon was identified, signalling an expectation that the public sector will eventually be involved in some aspects of carbon trading (MfE, 2007b), with credits to be managed through a New Zealand Emissions Units Register. Emissions inventories and emissions reduction plans for all 34 departments were posted on the MfE website on 4 April, 2008.

The objective of this paper is to report research on the progress to date of the six departments in the pilot scheme. In particular we examine technical issues, discuss the prospects for the Public Service leading by example, comment on the present role of offsetting in achieving carbon neutrality aspirations, and discuss the policy implications of these findings.

## **Methods**

Inventories and emissions reductions plans for the six lead agencies were obtained from the MfE website in April, 2008 (MfE, 2008), and critically examined in terms of fossil-fuel use, activity profiles and proposals for future progress, particularly the extent to which emissions reductions are intended to be pursued prior to offsetting. Semi-structured interviews were conducted with key personnel in each of the six lead agencies on 19-20 March, and 8-9 April, 2008. Each interview was recorded, and transcribed prior to analysis. As the MfE both leads, and participates in, the carbon neutral public sector (CNPS) initiative, our MfE interview considered both roles. The interviews were focused on understanding employees' experience of implementing the CNPS programme, including issues arising from compiling inventories; determining the offset threshold and approaches to carbon management; and issues of resourcing, employee attitudes/behaviour, and leadership. In preserving the anonymity of individual participants we provide summary accounts of relevant interview data, and only deploy a very limited number of anonymous direct quotes. Comparisons and comments are made on a departmental basis where appropriate.

## **Results**

### *Inventories*

The departmental inventories were compiled according to procedures given in the Greenhouse Gas Protocol (WBCSD/WRI, 2004) and subsequently prescribed in international standards (ISO, 2006). Raw data was presented in carbon dioxide equivalents (CO<sub>2</sub>e), grouped into three "Scope" categories as per ISO specifications viz:

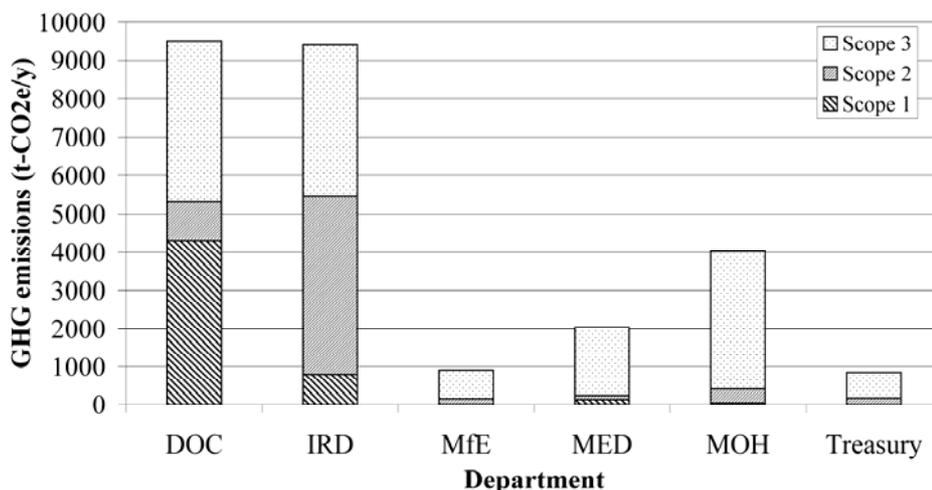
- Scope 1 (direct emissions; including purchased fuel),
- Scope 2 (indirect emissions; primarily purchased electricity) and

- Scope 3 (an optional category which may include air travel, rental vehicles, outsourced services, staff commuting to work, etc).

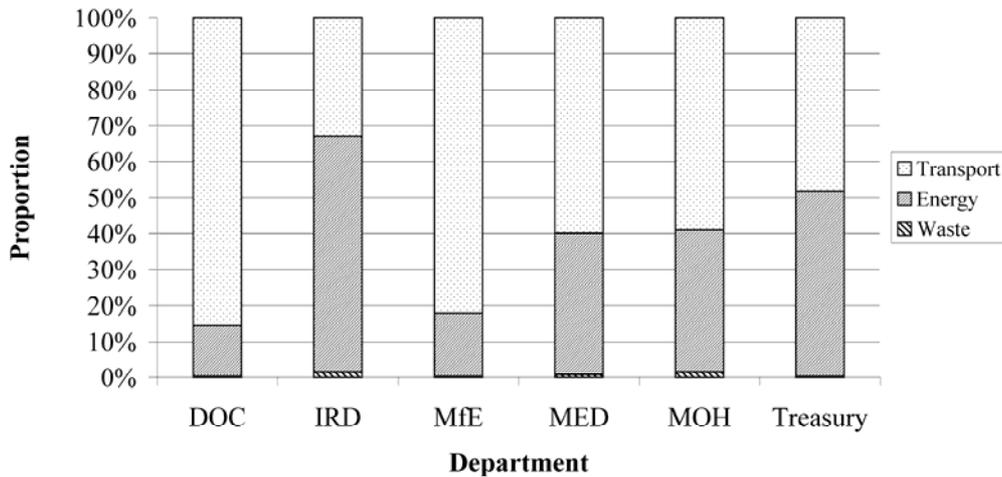
MfE provided the majority of emissions factors used by the six departments. The cited emissions factor for purchased electricity of  $2.091 \times 10^{-4}$  t-CO<sub>2</sub>e/GWh was derived from the contribution of thermal and geothermal resources to total generation in 2006 (MED, 2007).

Total emissions ranged from a low of approximately 850 t-CO<sub>2</sub>e/y for the Treasury, to a maximum of approximately 9510 t-CO<sub>2</sub>e/y for DOC (Fig. 1), with a grand total for the six departments of 26730 t-CO<sub>2</sub>e/y. Scope 1 emissions comprised a relatively large proportion of emissions for DOC, largely on account of fuel purchases, but were minor for the remaining five departments. Similarly, Scope 2 emissions were a relatively small proportion of all individual totals, with the exception of the IRD. Scope 3 emissions were notably the largest proportion of emissions for four departments, and came a close second in the case of DOC and IRD. On a source basis, transport accounted for the majority of emissions for DOC, MED, MfE and MOH, and 48% for the Treasury (Fig. 2). Energy, primarily purchased electricity, was the largest emissions source for the IRD, and contributed a significant proportion for MED and MOH. Waste to landfill contributed the residual, varying between 0.3 and 1.6% of totals. Examination of the core activities of each department offers some explanation of these values and proportions. MfE, MOH, MED and the Treasury primarily carry out office based advisory functions, but national and international travel frequently plays a major part in delivering their services. For example, MOH officials visit District Health Boards throughout New Zealand, whilst MED officials may be required to accompany Government ministers to international conferences and meetings, often at short notice. In contrast IRD responsibilities necessitate considerable printing and electronic data management, plus some travel, whilst DOC is a largely field-based based organization in which staff and goods must travel to remote locations, often by air. As such DOC purchases considerable quantities of fossil fuels for its operations (Scope 1), in addition to outsourcing helicopter hire and air travel (Scope 3). When calculated on a full time equivalent (FTE) staff basis, emissions varied from 1.7 to 4.5 t-CO<sub>2</sub>e/FTE.y (Fig. 3), with an average value of 2.9 t-CO<sub>2</sub>e/FTE. These compare with the New Zealand national figure for 2006 of 18.7 t-CO<sub>2</sub>e/capita.y (after MfE, 2008bbook), and long term targets out to 2050 of around 2.0 t-CO<sub>2</sub>e/capita.y, e.g. (Stern, 2008).

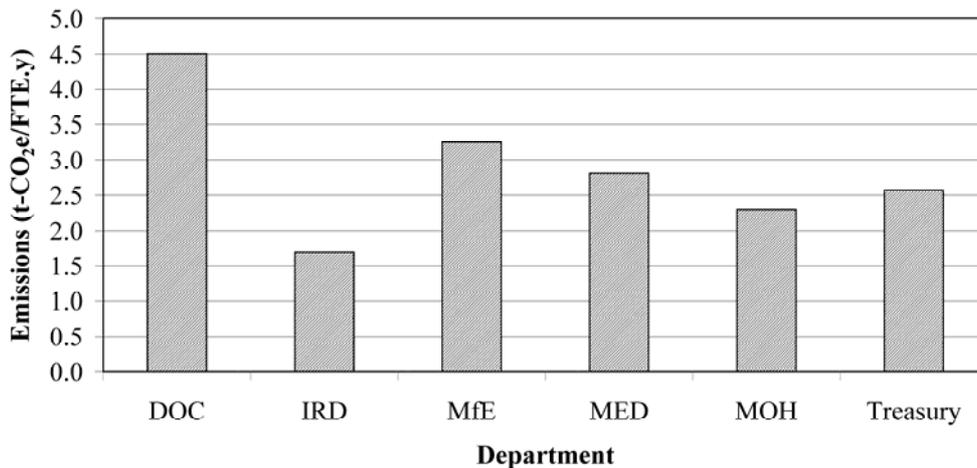
**Figure 1: GHG emissions weights by scope**



**Figure 2: Relative GHG emissions by source**



**Figure 3: GHG emissions per FTE**



*Emissions Reduction Plans*

Departments were required to give serious consideration to emissions reductions, within practical and economic constraints, and to produce an emissions reduction plan covering the period through until 2012. All plans are informed by the statement “It is necessary to undertake reduction activities that will reduce emissions as much as practicable and be cost effective”. Plans contained varying combinations of quantitative targets to be attained or aspired to, and qualitative measures to be implemented, by 2012.

The DOC emissions reduction plan details a variety of measures aimed at total emissions savings of up to 1837 t- CO<sub>2</sub>e by 2012, representing a reduction of 19.3% over the base year. Proposed actions include a) reducing vehicle emissions by approximately 33% (1300 t-CO<sub>2</sub>e), via fleet replacement and increased use of diesel; b) reducing air travel by 15% (150 t-CO<sub>2</sub>e); c) reducing helicopter use by 5% (140 t-CO<sub>2</sub>e); d) reducing electricity use by 15% (150 t-CO<sub>2</sub>e); and e) reducing oil use in generators by 50% (76 tonnes CO<sub>2</sub>e). The department has

an active programme of introducing web cam technology in order to reduce staff travel and is also assessing the impact of its pest and weed management programmes, and other management work, on the carbon sink capacity of its estate. The DOC plan lists a number of initiatives already in place, and includes proposals for energy, and continued waste, audits.

The IRD plan incorporates a 10% reduction in energy use per FTE by 2012 in accordance with a "Cabinet directive". A workplace travel plan is to be in place by 2010, targeting a 15% reduction in kms travelled. Other targets include a 10% reduction in emissions from taxis and rental cars by Dec 2008, a 3% reduction in vehicle fuel use by June 2009; a 10% reduction in air km travelled by 2010; and compliance with a government target of 25% reduction in vehicle emissions by 2012. The department aims for a reduction in waste to landfill of 40% by 2010, with all IT and furniture having recycling options by 2008 and 2009 respectively. A strategy to introduce video conferencing is included in the plan. The IRD plan includes comprehensive proposals for energy audits and travel planning.

The MED plan aims for emissions reductions of 270 t-CO<sub>2</sub>e by 2012, a decrease of 13.2%. However within the detail of the plan there are relatively few quantitative targets. Those proposed are to a) reduce vehicle travel distance by 15%, and b) to reduce waste to 15 kg/FTE.y, both by 2012, and to aim for a further 10% reduction in energy use. Detailed travel planning, including travel prompts ("do you really need to go") and efficiency related instructions to travel providers are included, and video conferencing is being introduced. The plan also includes energy audits, waste audits, and incorporation of detailed energy and sustainability criteria in contracts for outsourced services and tenanted buildings. Achievements to date including an 11% reduction in energy used in MED office space, giving a density 107 kWh/m<sup>2</sup> (within the EECA low benchmark of 120 kWh/m<sup>2</sup>), are listed. Recent domestic and international air travel distance reductions of 14% and 26% are also noted, whilst trans-Tasman air travel had increased by 27% due to increased dialogue with Australia.

The MfE plan contains two interim targets: a) a 5% reduction in electricity use per FTE by June 2008; and, b) to reduce emissions associated with workplace travel by 6% in year 1. These are to be achieved via demand management strategies, aiming to stay within the EECA low benchmark (MfE has been at 117 kWh/m<sup>2</sup>), and by a 6% reduction in workplace travel in 2008. A travel plan is being drafted and bus concession tickets are supplied to staff to reduce taxi usage. The MfE stated focus is on behaviour change, encouraging a culture of resource efficiency and seeking cost effective operational efficiencies. Energy audits, waste audits, an energy awareness campaign, travel planning and the construction of a video conferencing facility are either in progress or proposed.

The MOH plan contains no quantitative targets, but highlights planned actions to focus on workplace travel, particularly air travel, and on energy usage, and to increase staff awareness. Travel targets will be set, travel planning initiatives promoted and video conferencing facilities installed. Development of energy use targets is listed, along with a wide range of energy saving initiatives. Similarly, waste targets and reduction measures are proposed. The plan notes that although District Health Boards are not required to go carbon neutral, they have shown considerable interest in the programme.

The Treasury plan is similarly comprised of largely descriptive targets focusing on business travel and energy use. A workplace travel planning initiative is to be undertaken by

December 2008, an energy audit is planned and waste audits will be continued. One quantitative goal listed is to replace all computers with new units consuming 50% less electricity by June 2010.

In summary, DOC and MED have proposed quantitative targets in terms of GHG emissions reductions by weight, representing in this case contractions of approximately 20% and 13% by 2012. Other departments have given quantitative targets for specific metrics such as distance travelled. Qualitative targets are included in all plans and it is evident that all departments are aware of the areas in which both minor and significant GHG reductions can potentially be made.

### *Interviews*

In introducing this section we note that interviewed personnel involved in producing the inventories, and in the design of the initiative, came from a striking array of professional backgrounds – including accounting, law, investment banking, human relations, facilities management, information systems and risk management. The learning curve involved and multi-disciplinary nature of the work was reflected by one interviewee who commented, “It is all so new and evolutionary ... I couldn’t honestly say what you would do to train yourself up to work with carbon neutrality.” We were also struck by the ideological commitments of some interviewees and that most seemed conscious of their leadership role.

In relation to accounting matters, one common theme was a basic lack of records and base data for emissions inventories. Gaps in information about property portfolios, the need to manually rework travel information into useful units, and dependence on information from landlords were identified. Several interviewees questioned the meaningfulness and utility of specific metrics, and it was reported that some employees did not understand emissions metrics at all (“when you talk to people about carbon they kind of glaze over”), whereas financial cost savings seemed more salient. Organisational ‘boundary issues’ were raised. One interviewee related this to the issue of defining ‘core business’. For example, huts and campgrounds used by visitors are excluded from DOC’s inventory. Likewise the Inland Revenue’s inventory currently excludes the use of paper, which it was suggested would double the IRD’s reported carbon footprint if included. Our MfE interviewees related the difficulties in selecting carbon sequestration rates for forestry and bush regeneration-based offsetting, with 11 different opinions differing by approximately 50%. It was indicated that only about 1/3 of emissions would be sequestered through forestry.

Interviewee attitudes towards targets varied considerably. Some comments indicated a present focus on small wins or “low hanging fruit” as opposed to deep contractions. “Low hanging fruit” frequently cited were the use of double-sided printing, and removing employees’ waste bins, and encouragement of staff to schedule multiple out-of-town meetings per trip, rather than multiple trips. Others conceived of higher reduction rates (60-70%) being for example “30 or 40 years out”. Some interviewees suggested that some departments were expressly avoiding targets in favour of “travel in a positive direction”; one stating “in some ways it’s allowing people to be creative, because there’s no base there”.

In general we found that departments conceived of the level of activity that *cannot be avoided*, in association with a) safety and legal compliance issues; b) fears over loss of service

standards; c) fears that cutting emissions reduction strategies would compromise the national economic interest; and d) loss of client contact. For example, the IRD compliance strategy, and the risk associated with non-compliance, are non-negotiable. Safety issues were evoked by our DOC interviewee. For policy departments, increasing “external engagement” and “international connectedness” were seen as “core business” priorities, which presently *demand* international travel and face-to-face contact. These priorities seemed to rank well above reducing international travel emissions. The peripheral global location of NZ was also invoked here and elsewhere. Some interviewees invoked the maintenance of commercial relationships as a justification for incurring domestic and international travel emissions.

We asked interviewees about the possibility of fundamental changes in service delivery in the context of deep cuts in emissions. One example of ‘rethinking services’ is the IRD’s current investigation of what legislative and technical shifts would be necessary to enable internet-based services and transactions with clients. Other interviewees suggested a reluctance to opt for “ramping up ... technology” themselves; preferring the less risky strategy of allowing contractors to develop alternative technologies like videoconferencing. Generally there was a view that conflicts with core business would limit emissions reductions.

Interviewees also identified conflicts between the CNPS initiative and other government priorities, including departmental funding focused on the achievement of government outcomes (as opposed to “joined up government”) and lack of funding for CNPS emissions reduction measures. In one interview, there was discussion of an elemental conflict between the CNPS and dominant neoliberal values “across government.” A key factor emerging from the interviews is that some departments have plans for growth, leading to one interviewee identifying that “the emissions footprint will increase” notwithstanding the achievements of the emissions reduction plan. A number of interviewees made connections between the CNPS, rising global oil and energy prices, and the peak oil debate. Others commented on the resultant shortened payback period on capital projects e.g. green buildings.

The MfE reported considerable engagement with both private and public sector organisations seeking advice on going carbon neutral and on emissions reductions. Other departments also reported requests for information of a “how to” nature. Anecdotal evidence from our interviews suggested that MfE employees were in demand by all 33 other departments. Interviewees, sometimes reluctantly, identified themselves as breaking ‘new ground’, reporting a lack of international public sector experience, guidance or benchmarks to draw on. One interviewee reported that the consultant they hired to help with the process was “as much on a learning curve” as the department. There was also a perception that carbon neutrality in the for-profit sector aims to “reduce nothing and offset everything.” Other interviewees noted successful engagement with employees over incremental changes like rationalising travel. Overall there was considerable evidence that the CNPS is promoting active cooperation and partnerships between the lead departments and that this was seen as beneficial.

## **Discussion**

The question of whether the CNPS departments are leading by example, and whether they will do the future, may be addressed in two parts: a) who is being led?; and b) what example is being set? In response to the first part of this question it is clear that the CNPS initiative has resulted considerable co-operation and information sharing within the six lead agencies and also with the remaining 28 government departments, and that this has been a positive

experience. There is anecdotal evidence that this leadership, particularly that of MfE, is also reaching into the private sector. However, further research is needed to track the size, nature and impact of this on carbon neutrality developments in the business sector, and also in other public sector organizations presently outside the scope of the programme.

Addressing the second part of the question raises several issues. In terms of procedure, the programme sets an arguably fine example in terms of protocols used, methodology development, inter-agency co-operation, and relatively rapid generation of inventories and plans. Considerable awareness-raising has occurred and departments now know the size and individual sources of their GHG emissions with reasonable accuracy, and are aware of the uncertainties. This has provided a focus for action as detailed in the reduction plans. However the varying use of quantitative vs qualitative targets in the plans is significant in terms of the example being set. DOC and to a lesser extent MED have clear quantitative reductions targets expressed as t-CO<sub>2</sub>e, corresponding to emissions contractions in line with those being called for internationally for high emitting countries. Whilst other departments have signalled targets for certain activities, these are not given in GHG reduction terms, and MOH and to a large extent the Treasury have relied on descriptive goals. There is clearly no agreement on this matter within the CNPS programme and the example set is thus mixed. Both absolute and emissions intensity measures were utilised in inventories and plans; but evidence in our interviews suggested such metrics were not understood by some staff. However some interviewees recognised that as an organization expands, efficiency gains can be negated by growth i.e. that the mass of CO<sub>2</sub>e is either unaltered, or increases; with clear implications for leading by example.

In relation to the use of offsetting, the best reductions scenario (DOC) nonetheless requires 80% of emissions to be accommodated by offsetting i.e. the offset threshold is 20%. For other departments the likely offset threshold is nearer 10%. One signal which may be sent from this is that deep emissions reductions are simply in the “too hard basket”, or, that the reductions step just involves minor adjustments, resulting in “business-a-little-less-than-usual”, prior to opting for offsetting. Stronger evidence of difficulties may be seen in recent UK experience, with overall GHG emissions reductions from 21 government departments of only 0.7% between April 2006 and March 2007 (Ball et al., forthcoming).

The two major emissions sources are purchased electricity and transport. In relation to electricity, we argue that lead departments are demonstrating good faith in reducing consumption. However, the electricity emissions factor is a function of the proportion of fossil-fuel fired and geothermal generation, and departments have a limited influence on this mix, given present New Zealand electricity industry arrangements. Even purchase from a carbon neutral certified generator does not guarantee that fossil-fuel generated electricity will not be delivered to a department at any given time. The relative use of coal, oil and gas in generation is arguably a central government function, and we note that since New Zealand possesses the resources to be almost totally renewable in future electricity generation (MED, 2006), fossil fuels could be phased out as a matter of policy. In this case the emissions from departmental electricity consumption would then become very small indeed.

In relation to transport, we found some evidence of leadership in terms of reduction (travel less), emissions efficiency measures (e.g. replace vehicles) and substitution (e.g. video links); but the indications are that these are seen as limited options which will make no deep impact

on emissions. Further, there are no signs that travel emissions factors in NZ will vary substantially in the near future. We concur with Monbiot (2006) that aviation is presently in the “too hard basket” and that the solution will require either a fundamental paradigm shift in the way departments do business, or an allocation of GHG emissions and/or increased offsets to selected departmental activities. Given the essential public service functions they are charged with, we argue that for the CNPS initiative to provide leadership on travel (particularly air travel) emissions, it will need to question whether reductions can indeed be addressed on a department-by-department basis; or whether the public service needs to be considered more holistically and, indeed, democratically.

The example being set in terms of offsets and in particular the use of forestry and bush regeneration, raises several interesting issues. Malhi et al. (2002) show that extensive afforestation and forest protection has the potential to significantly sequester global carbon emissions “over the next few decades” but point out that over the next century the quantity stored will be dwarfed by projected carbon emissions from fossil fuel combustion. These authors suggest that atmospheric CO<sub>2</sub> levels could fall by 33 ppm at best, given a halt to deforestation and an aggressive programme of reforestation. On an ethical level, offsetting as policy is strongly contested in some quarters on the basis that it is merely a means of purchasing indulgences for unaltered behaviour e.g. Smith (2007). Thus the present use of biomass-based offsetting in the CNPS programme in order to account for >80% of “unavoidable” emissions may, if unqualified, send a signal to others implying that there is ample local and global capacity in this area. We note that some offset providers deal only in projects which reduce fossil fuel consumption, specifically excluding forestry, e.g. The Gold Standard (2008), and suggest that local options such as the closure of coal-fired electricity generation plant, and substitution of woody biomass for thermal generation, should receive serious future consideration.

No fundamental paradigm shifts are apparent in the NZ Public Service at this point, although considerable goodwill is present, and some technical solutions, such as those being investigated by the IRD, offer potential for substantial GHG reductions. Perhaps the next stage in this initiative is to examine ways in which renewable electricity generation can be more actively pursued, and the present priority on transporting people and goods, particularly by air, can be fundamentally challenged.

## **Conclusions**

The CNPS was launched in 2007 with clear and sound protocols. The inventories and emissions reduction plans of all 34 core government departments were publicly available by April 2008. This in itself is a notable achievement. Inventories for the six lead agencies were dominated by transport emissions, with electricity contributing significantly, but waste to landfill accounting for < 2%. Emissions reductions plans indicated variable reductions goals, with a wide range of qualitative and quantitative targets. Interview data reflected fundamental tensions between commitments to essential services, service growth and emissions reductions. Plans relied heavily on offsets, which provides a contestable example to society. The scheme exhibits characteristics of “business-a-little-less-than-usual” as opposed to any paradigm shift; with the arguable exception of DOC and IRD. The New Zealand public sector could eventually achieve a high degree of energy emissions reductions, as opposed to offsets; but this requires central government to lead on renewable energy development. We are sceptical as to whether the CNPS initiative will develop any effective mechanism in relation to travel

(particularly air travel) emissions. The solution here too may lie outside the scope of public administration, requiring political rather than managerial leadership.

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