

RESOURCE CONSERVATION IN EXISTING COMMERCIAL OFFICE BUILDINGS



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Summary

Faced with industry skepticism, complacency and short term thinking, central government in New Zealand has taken a leadership role in promoting sustainable development as the way forward for the nation's building sector. A suite of government policies and strategies that collectively will have a significant effect on resource conservation in existing office buildings is discussed. This set of strategies successfully integrate voluntary, mandatory and direct action interventions with triple bottom line sustainability effects and tactical mechanisms with green building assessment systems to deliver a new 'green' paradigm for New Zealand's built environment.

The interventions tend to focus on new buildings rather than existing buildings. Yet the maximum potential for energy savings lies with the existing building stock [1] and the primary reason for government intervention in this sector is related to the fulfillment of New Zealand's Kyoto carbon emissions obligations. Some thoughts are therefore offered on possible specific government resource saving measures for existing commercial office buildings.

Keywords: Sustainable development, existing, commercial, office, buildings, renovation, retrofit, policy, strategy, triple bottom line sustainability

1 Introduction

A high proportion of existing office buildings are resource profligate in both operation and maintenance [2]. As resources become scarcer and international obligations to mitigate the effects of climate change become more onerous, these buildings will come to represent a disproportionately high resource burden on our communities, unless they are replaced or upgraded. For a series of complex financial, social, cultural, historic, environmental and ecological reasons it seems that many of these existing buildings will be retained and utilised throughout much of the 21st century, though not necessarily for their original purpose [3] [4].

When the current Government came to office in 1999 virtually all of the enthusiasm for sustainable development that had been generated by the 1992 Rio Earth Summit had been dissipated by six years of governmental indifference and inactivity. The new Government, though favourably disposed to Agenda 21 objectives, initially saw itself in a supportive role for industry initiatives in this area. However, industry complacency and lack of long term thinking in relation to sustainability led to a rethink of its position. It could sit back and wait for industry to act, or it could develop strategies and policies to promote an industry wide attitudinal shift that would lead to the widespread adoption of sustainable development. To its credit government chose to act.

Central government has therefore, almost by default, assumed leadership in this area and has adopted sustainable development as the lynchpin of its policies and strategies in all sectors of government. In terms of the built environment, government's long term goal is to engage the whole building sector in the shift towards sustainable outcomes, with an ultimate target of mainstreaming environmentally sustainable design, delivery, operating and recycling systems throughout the building industry.

In recent times, there has been an increased sense of urgency to undertake actions that would have a real and rapid effect on reducing NZ's carbon footprint, with the surprising discovery that NZ would have to spend hundreds of millions of dollars per year on the purchase of carbon offset credits instead of being a carbon credit provider. Further strength was added to the case for rapid action by the dire climate change predictions spelt out in the latest report of the Intergovernmental Panel on Climate Change [5].

2 Policies and Strategies

Over the last five years central government has developed and promulgated a whole series of policy and strategy initiatives. These are of three types, those that are voluntary, those that are mandatory and those that involve direct government action.

2.1 Voluntary Initiatives

Voluntary initiatives evolved from a series of reports by government departments setting out the current situation and establishing targets with respect to sustainable development in their respective fields.

2.1.1 New Zealand Green Building Council

Central government combined with industry to provide start up funding for the New Zealand Green Building Council (NZGBC) in 2006. The NZGBC recently issued its Green Star – Office Design v1 assessment tool. Four star buildings demonstrate a NZ best practice standard; five stars a NZ excellence standard while six stars represent a world leadership standard. As with its parent systems the commercial assessment tool is primarily focused on new buildings, but can also be used successfully to assess major refurbishment work.

2.1.2 Govt³

Recently, 49 elements of government, including all 34 of the ministries and departments signed up to what is called the Govt³ compact. The '3' in this case denotes triple bottom line or financial, social and environmental sustainable thinking in a wide range of public service activities including buildings. This is a voluntary scheme, and signals a 'green'

shift in attitudes within the public service. The Ministry for the Environment's Sustainable Industry Group provides leadership and co-ordination. Govt³ provides a mechanism to contribute to the creation of successful outcomes through an iterative process of learning from and work with other government departments.

The declared aims of the group are to undertake practical action, learn from and share knowledge with other participating agencies, link people together and provide technical information and case studies.

Participatory partnerships of this nature have been rare in the past within the public service. Credit for initiating and encouraging this action goes jointly to the Prime Minister and Cabinet Office and the Ministry for the Environment. While Govt³ is focused on the 34 core government departments there are also 15 State Sector Organization Govt³ partners including one university, Victoria University of Wellington.

In terms of the building sector Govt³'s greatest impact has been in the sharing of briefing information and in providing feedback from tendering and building operations. Such information has, in the past, been secreted within departments and decision making has been undertaken in an insular fashion.

2.2 Mandatory Provisions

2.2.1 General

While voluntary initiatives are relatively quick to implement they tend to be taken up largely by those organizations and individuals already convinced about the benefits of sustainable development. Successive New Zealand governments have consistently rejected the idea of subsidies and financial incentives, particularly in the commercial sector, as being too expensive, open to abuse and prejudicial to voluntary adopters of 'green' design practices. Therefore a range of mandatory provisions have been developed to ensure that 'green' adopters are not disadvantaged and to ensure that, over time, buildings will become more sustainable.

2.2.2 New Zealand Building Act (2004)

The primary piece of legislation that directly affects sustainable development in the building sector is the Building Act (2004). This establishes a sustainable development filter to all construction provisions contained in the Act. All four Purposes of the Act have strong sustainability dimensions, with one stating that "performance standards for buildings (are to be) set to ensure that ... buildings are designed, constructed and able to be used in ways that promote sustainable development" [6]. The Act goes on to list a set of 16 Principles that must be taken into consideration in drafting the various clauses of the Building Code. All of these promote sustainable values, including the conservation and efficient use of energy, water and materials, whole life costing, use of healthy, low maintenance and durable materials and the consideration of heritage and cultural values.

The Building Code that will give effect to this Building Act is currently in preparation. It is likely that the initial resource requirements will be challenging for the NZ building sector and that they will be adjusted upwards over time in a series of preordained steps. Central government has indicated its intention that standards set for government owned and leased buildings will be maintained at a level that is one step up from the minimums set in the NZ Building Code (NZBC). The idea is that the building industry becomes familiar with producing buildings to these elevated standards and therefore it will be much easier to obtain ready acceptance in periodically raising the base standards in the NZBC.

2.2.3 Waste Minimisation (Solids) Bill

The aim of this Bill is to drastically cut waste through the charging of a Waste Levy. Levy money is to be used to finance sector administration, research, education, and waste minimisation initiatives, without recourse to the public purse. Construction and demolition waste comprises about half the solid waste in New Zealand. This Bill is therefore likely to have a major effect on the generation, diversion and reuse/recycling of material resources in the building sector and could lead to major material resource savings. It is likely that material and disposal costs will rise significantly over time and that this will promote the retention of existing buildings and the reuse of existing materials and components.

2.3 Direct Action

2.3.1 General

While the voluntary and mandatory initiatives described are changing the context in which the building sector operates and the attitude of both organizations and individuals to resource conservation, the time scale involved in generating meaningful amounts of change is protracted and the effect on New Zealand's built environment will be relatively slow. The measures described are also unlikely to convert skeptics. Government therefore decided that the only way to instigate rapid improvement was to initiate change within its own direct sphere of influence to demonstrate technical and financial feasibility.

2.3.2 Carbon Neutral Public Sector

In February 2007 the Prime Minister announced the Government's intention to establish a carbon neutral public sector and stated that it would use its purchasing power to drive the changes necessary to accomplish this paradigm shift. To put this in context, central government spends at least \$25 billion dollars a year and intends to modify its purchasing protocols to extend preferential status to materials, products and companies that can demonstrate a substantive 'green' profile.

Central government is also responsible for more than 30 % of the buildings in New Zealand. It does not own office buildings, so all office space occupied by public service departments is leased. In Wellington 60 % of the big tenants and a significant proportion of the small tenants are from the public sector. The Government has announced that as from the 1st of July 2007 all new direct tenancy agreements for public service departments are to be in buildings that have a minimum 5 Green Star rating if located within a central business district (CBD) and a 4 Green Star rating elsewhere.

It is expected that many of the quasi-government agencies, publicly owned companies, publicly funded organizations, local authorities and companies who want to sell goods to government will also seek to find accommodation in 'green' buildings. Government is concurrently reviewing the sustainability criteria for all new government buildings. Once in place this is likely to lead to new criteria being set for the upgrading of existing buildings. These criteria are also likely to influence the existing office building sector...

3 Implications for existing office buildings

The interventions described and discussed above are essentially aimed at new, high quality buildings. However, major reconstruction work is covered by both the new Building Code and the Green Star assessment system. The new Department of Conservation headquarters

building is an outstanding example of what can be done. This building has achieved a Green Star NZ, 5 star equivalent rating. It was constructed inside a redundant cinema complex and achieves 50 % energy savings and 77 % non-potable water savings all for a 12 % owner and 10 % tenant premium cost. Full cost recovery will occur about halfway through the initial 12 year lease period and from then on significant cost savings will accrue to both parties. The building is being extensively monitored and will provide good feedback for the Govt³ group on what is practically achievable in refining future existing office building ‘green’ performance briefs.



Fig. 1 Atrium roof and 4th floor garden from tower

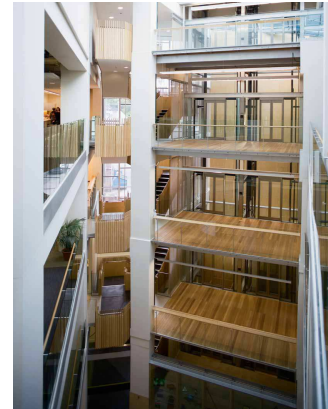


Fig. 2 Atrium interior

The private commercial sector is slower to adopt ‘green’ design. However, Hince [8] of CB Richard Ellis Property Managers stated recently that in Wellington, “building tenants are seeking higher quality accommodation with environmentally sustainable features becoming increasingly important... I would expect to see a high vacancy in the lower quality of building... by acting now and upgrading and refurbishing these buildings the owners should go some way to alleviating this risk.” Some existing office buildings like 50 Customhouse Quay, are featuring environmentally sustainable design in their refurbished buildings, but in many cases this amounts to incremental improvement in energy efficiency and does not attract a Green Star rating or any other form of recognition.

It would be highly desirable if the currently unused 1, 2 and 3 Green Star rating categories could be used to encourage incremental performance improvement in existing buildings. Another approach would be to introduce an occupancy certification system for existing buildings under which resource use was mandated and monitored, with carbon credits having to be purchased to make up for any performance shortfalls.

4 Conclusions

For a number of reasons central government has assumed leadership in making New Zealand’s built environment more sustainable. The voluntary, mandatory and direct action interventions have met with considerable success and are likely to have even greater impact in the future. Government’s financial support for the establishment of the NZ Green Building Council was crucial and their most recent pronouncement that all future public service department leasing will be in 4/5 Green Star rated buildings can only consolidate and institutionalize the position of the NZGBC and its Green Star rating system. The establishment of the Govt³ program within government, a preferential, ‘green’ purchasing

policy combined with the passage of a new building act which has a strong sustainability focus all send strong messages to the whole of the building sector. In Wellington there has already been a dramatic attitudinal shift towards an increasing acceptance of ESD as the norm, particularly over the last 12 months, and this appears to be still gathering momentum.

High end new buildings seem to be the target of all these interventions, with existing buildings only being included, if at all, on an incidental basis. There are a few examples of 'green' upgrading in Wellington but these are notable exceptions to the essentially new building focus. No credit is given for incremental 'green' upgrading; the NZGBC assessment system currently only rates 4, 5 and 6 star buildings, the revised Building Code will require performance upgrading of existing buildings but only for those parts of existing buildings that change and apply for building consent. Yet, with an office building replacement rate that hovers around 1.5% [9], the most dramatic resource gains could be made in office buildings by improving the buildings we already have.

If central government are to be the leaders of the 'green' building movement in New Zealand and the building sector as a whole, is to become carbon neutral and resource efficient, it is vital that they prioritize the develop of specific interventions to improve the sustainability of our existing buildings.

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