

**SUBMISSION TO PRODUCTIVITY COMMISSION'S REFERENCE:  
"Improving the future performance of buildings"**

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**INTRODUCTION**

I welcome the Commission's Issues Paper on this significant subject.

I have responded to a few areas, and raised some new aspects. These points reflect my work experience and education (see appendix for brief CV). I would be willing to refer the Commission to specific references to organisations and documents.

I make three main points:

- 1) An information system is needed on innovations and evaluations of building designs & operations which are environmentally preferable; (as well as indications of adoption of practices recommended in guides and codes)
- 2) The concept of "input saving technologies" for environmental benefits needs not to be confined to quantity nor to energy efficiency;
- 3) Such "input saving technologies" need to extend to soft technologies, such as management systems as well as to physical materials. Thus for conserving 'transport energy' both physical design, construction and management systems are desirable to optimise the benefits.

**COMMENTS ON THE SCOPE OF THE STUDY**

The scope of the study extends to practical aspects of ecological sustainability. The inclusion of the impact of "whole-of-life building costs" (among these are the social costs (p.5), presumably covering environmental externalities) is most welcome.

A key question for this study would need to be –

How could "input saving technologies" in commercial buildings assist the goal of Reaching towards ESD?

This question highlights that "input saving technologies" need not be confined to "technology which reduces the quantity of inputs.." (p.4) since the issue for environmental protection is the source and embodied energy of the inputs (cradle-to-grave), not merely quantity.

Since the focus is on commercial (incl retail) buildings, the study necessarily touches on urban design and the context of the urban form. On the climatic aspects of a building in context, see Bureau of Metereology [www.bom.gov.au/info/leaflets/urban\\_design.pdf](http://www.bom.gov.au/info/leaflets/urban_design.pdf) As a result

of this context, **building standards** need to be cognisant of their effect on neighbours and the locality. One example appears to be the standard for ventilation of underground car parks and the need for controls on noise and vibration from the exhaust fan to protect the amenity of neighbours.

### **Consequences of the scope of the study:**

- (1) the breadth of interested parties concerned with ecological sustainability aspects of building performance (from investors, developers, builders, urban designers and architects, eco-material specialists, specialists in environmental and sustainability indicators, planners, and environmental health practitioners);
- (2) the need for a clearinghouse of information, a veritable information system, on sustainable building design & construction, products, and re-use options, services and management systems, & information & education networks.

### **Inclusion of transport planning in the performance of buildings**

A building for commercial (incl retail) use is necessarily a **‘trip generator’** since the building attracts employees, clients, and shoppers. The construction of a building determines travel and contributes to choice of mode. According to the National Greenhouse Gas Inventory (1996), national transport emissions grew by 15% - the fastest growth of any sector. In the absence of measures to limit greenhouse emissions from transport, the Bureau of Transport Economics projects that transport emissions will increase by 42% on 1994 levels, by the year 2015. Transport greenhouse emissions from car drivers who can access destinations by mass transit consume a share of emissions which could otherwise be allowed for job-creating industries.

To attend to the environmental impact of a building, therefore, it is essential to consider transport planning by sustainable modes. Several aspects are relevant here:

- the location of a building in relation to the existing mass transit system;
- the state of the mass transit infrastructure and services;
- complementary measures to optimise ease of access by sustainable transport (often marketing, management); and,
- constrain dependence on cars by limiting parking.

The allocation of space to parking for cars can be reduced, whereas greater attention is needed to secure parking for bicycles. Further, provision is needed for showers and lockers close to bicycle parking.

In reducing the allocation of parking space to cars, funds can be diverted to supporting local bus routes to service the needs of the building’s employees and clients. In some cities, where “green transport clubs” involving “car sharing” arise, even residential buildings are being designed and constructed as “car free” with very limited parking and the resulting savings being fed back into the amenity of the site.

I refer the Commission to the National Greenhouse Strategy's measures for integrating landuse, in the design & construction of commercial and retail buildings – especially see sections 5.2 (I) and 5.3 (p.57) – [www.greenhouse.gov.au/pubs/ngs](http://www.greenhouse.gov.au/pubs/ngs)

While buildings and sites can manage to reduce greenhouse emissions from transport (as addressed through the UNSW Greenhouse Challenge Agreement, for example) it is preferable to address the fundamental, primary question of location.

I note that in other countries, the location of retail centres and even industrial estates are being controlled by codes to reduce the length of trip and the reliance on private car travel. In NSW, the Department of Urban Affairs and Planning has issued *Shaping Sydney* and plans to launch a re-invigorated centres policy as well as to revise the policy on traffic generating development and introduce a metropolitan parking policy.

In Australia, some organisations are finding the British Green Transport Plans very useful and these could be adopted by a building manager or a committee of managers for a precinct - [www.local-transport.detr.gov.uk/gtp/index.htm](http://www.local-transport.detr.gov.uk/gtp/index.htm)

Building designers can also be creative in their proposals for streetscapes being designed for people walking, using prams and wheelchairs, and incorporating bus shelters and drop-off/pick-up points for taxis.

#### **COMMENTS ON “THE ENVIRONMENTAL IMPACT OF BUILDINGS” (P.7)**

The Issues paper identifies 3 main impacts, of which energy consumption is identified as the second way, transport energy could be an explicit addition.

Other impacts warrant recognition because designers can moderate the adverse aspects. These impacts are:

- (1) the consumption of land, and the sealing of surfaces reduces habitat for plants and animals, alters stormwater flows, and affects the microclimate
- (2) the microclimate changes are regarded as contributing to the “heat island effect” of cities.

New “eco-materials” made of recycled product, such as the German polymerbeton, are designed to avoid some of the adverse effects of sealing and paving surfaces, by allowing stormwater to pass through and to allow vegetative growth on the top. A further material useful for commercial buildings would be “superwindows” , with thermo-regulating properties that reducing energy for heating and cooling, and serves as an acoustic barrier.(von Weizacker E, Lovins Amory B & Lovins LH, *Factor Four: doubling wealth – halving resource use. A new report to the Club of Rome*, Allen & Unwin 1997)

Future performance of buildings would also include re-use of buildings as well as retro-fitting (see *Factor Four* above on retro-fitting). NB Lend Lease’s award for re-use of materials from the demolition of the State Office Block in Sydney.

Human health impacts could be fitted under the heading “the environmental impact...”. Human health impacts include: indoor air quality and the inclusion of internal, accessible stairs. Internal stairs, not restricted for fire emergencies, are important in allowing people working or using the building to take physical exercise. Indeed, the Commonwealth Health Dept’s program *Active Australia* is encouraging incidental physical activity for health. Climbing stairs is one activity for which strong evidence-based medicine research demonstrates makes a difference to health.

### **COMMENTS ON “DIFFERENT PERSPECTIVES ON PERFORMANCE”**

This section of the Issues Paper is interesting because it delineates the range of interests in assessing aspects of performance. In my observation, some of the innovative (admittedly residential) developments in Sydney, such as Lend Lease’s Newington, have been presented to the market in quite a conservative way. Social research indicates that some groups of people would like the choice and the housing market has been slow in responding and marketing to that interest.

Nonetheless, real problems can present when architecturally- valued buildings are designed to be dependent upon a high level of maintenance and protective use.

### **Dimensions of performance**

Under ‘energy efficiency’, it seems appropriate to include use of recycled materials and materials from sustainable sources (i.e. not rainforest timbers).

Under ‘location’, it seems necessary to adopt measures for accessibility by existing mass transit services e.g. metres from the railway station, and bus stop. Building developers may need to negotiate with mass transit suppliers, particularly bus services, to adjust routes, bus stops, frequency and time of services.

In NSW, at least, State government guidelines relate to these issues.

It is very surprising that overall tenant satisfaction (p. 13) did not include indoor air quality, because ‘tight’ air conditioning is a major source of concern to employees in offices. Further, separate conditioning is often provided for photocopier rooms.

### **Environmental performance (p.14)**

Under the para on greenhouse emissions, it would be very desirable to include the emissions from transport, because they are already significant at 17% and are the fastest growing sector. Further, about 40% of morning peak traffic is attributed to the use of company cars, travelling to office buildings. The Warren Centre, University of Sydney, has reported that the cost of traffic congestion is \$2 bn p.a.

In my view, the decision about location of a building in relation to mass transit access could equally be described as a “major input” into commercial buildings.

Thus commercial buildings can aim to be both ‘energy smart’ and ‘transport energy smart’. This aspect can be covered in Greenhouse Challenge Agreements. Further work is underway on this subject, and more information would be available to the Commission shortly.

### **Experience with codes etc**

In NSW, the Regional Organisation of Councils have developed codes for conserving water and energy, as well as minimising waste.e.g Inner Metropolitan Regional Organisation of Councils (IMROC). Some Councils have also adopted Development Control Plans to secure environmental savings.e.g Marrickville Council. Similarly, SEDA’s Energy Smart Business Program, mentioned in Box 5, has the potential to extend to ‘transport energy’. Further, the requirements for the Sydney Olympics to be “green” has affected building materials, infrastructure materials, landscaping, and methods of construction. The experiences of the consortium (12 developers) building for the Olympics are likely to be transplanted to other major developments, such as the Docklands Project, Victoria and internationally.

### **“Input saving technologies (ISTs)” p.15**

For environmental protection, the issue is not merely quantity, as I mentioned above.

The issues include: source (excluding wood from rainforests, and from peat, embodied energy).

Post-implementation reviews of adopted ISTs have been conducted in NSW by the Urban Design Advisory Service, Dept Urban Affairs and Planning; and by Environmental Services, Leichhardt Council.

The last question on ISTs for reducing greenhouse seems not to be motivated exclusively on cost-effectiveness. For firms involved in buildings, other motivations may include competitive advantage, realising social marketing opportunities, and being a good corporate citizen and including adoption of ISTs in its environmental reporting.

### **Appropriate input pricing (p.17)**

The Issues paper provides a useful explanation of market failure in relation to unaccounted costs. The costs of transport to access the building are externalised to the building and thus the impact of location decisions are passed onto employees, and customers. Builders can reduce these external costs and make a feature of easy access by mass transit in competitively marketing commercial space.

The Issues Paper enquires about the impact of energy, gas and water market reforms on the use of inputs, whether or the extent to which there has been a conserving shift. Because of the lag times, it is useful to recognise that transport has been targeted as an area for reform in relation to greenhouse, by reducing reliance on cars, and that, in Sydney, traffic congestion is projected to increase by 600% by about 2015. Therefore, a

transport management system could be packaged as an IST and included in an information system for improving building performance.

### **“Demand for energy efficient buildings” (p.17)**

This section of the Issues Paper deals with the “demand” for energy efficient buildings.

First, the availability of value-added, environmental enhancements for ISTs needs to extend beyond energy efficiency. As already mentioned in the Issues paper itself, the list of ISTs could be considerable e.g. water conserving measures, recycled materials. And this Submission has extended the list to include transport-related measures including locational issues, bicycle parking – some of which are already requirements or desirables in local government codes. The transport-related measures raised in this Submission are supportive of ‘transport-energy efficiency’. The three questions posed here could address ‘transport-energy efficiency’. From my observations, firms at least consider location, but in relation to the demographic map of the metropolitan area and proximity to other services, rather than the building creating a certain modal split. Consideration of the building’s connection to the transport network, and particularly access by sustainable transport modes is becoming more important for firms seeking commercial space. Implicitly, the attraction of locating in a ‘centre’ is to co-locate with a mass transit hub.

Secondly, this section appears to presume that the “end market” is responding rationally to the conditions that their building, as a lumpy investment, will face over time. Further, the social benefits may constitute a marketing advantage. In this respect, knowledge within the market about the current and future needs for conservation of natural resources and for travel-smart buildings is likely to be imperfect. Further, in my experience developers of major sites are often unaware of the availability of social research about the preference for environmentally-responsible services and products within the community. (eg NSW EPA’s “Who cares about the environment?”).

It would seem that developers rely on existing or past performance in the market, without much attention to latent demand for more environmentally responsible products and services. In my view, firms marketing buildings, both commercial and residential, in areas of good mass transit service often omit this characteristic.

### **Comments on ‘impediments to incorporating input saving technologies’ (p.18)**

The paucity in the uptake of environmentally performing ISTs surely is an example of market failure, as recognised elsewhere in this Issues Paper. It seems that in the context of natural resource conservation, it would be confusing for the Commission to re-use the term ‘efficiency gap’ when in market terms it is a problem of friction with information within and about the market.

***An information system on ‘best practice’ to obtain high environmental performance is required for the range of practitioners, including local government, the professions, and educators and students.***

Urban design competitions and demonstration projects may be a useful source of information about effectiveness of ISTs.

In my view, energy efficiency is the best served IST. It would be appropriate to bring together all the others and utilise experience in demonstrating and promoting this particular IST. Other ISTs relate to: materials, water conservation, waste minimisation, transport-energy conservation, human health, landscaping materials and biodiversity.

### **Hidden costs and benefits (p.19)**

The availability of frictionless information and sourcing of advice would assist in adoption of environmentally beneficial ISTs. Further encouragement through demonstration projects and design competitions probably helps too, although financial incentives would attract the 'neutral' and 'contemplator' groups.

The example of natural lighting could be extended to indoor air quality.

### **Tax system and ISTs**

A building tenant wishing to encourage users to travel by sustainable transport is discouraged by the current concessions under Fringe Benefit Tax. The existing tax system is inconsistent with the Federal government's strategy for economic measures to reduce greenhouse gas emissions from transport (National Greenhouse Gas Strategy). It allows concessions for cars and parking but not for seasonal public transport tickets. This anomaly encourages the construction of car parking in commercial buildings. This tax practice serves as a current disincentive to environmentally preferred practices from the construction and operation of commercial buildings.

The International Association of Public Transport's Australian branch, UITP Australia, has formed a Working Group (with representatives from the University of New South Wales, the Australasian Railways Association, the NSW Council of Social Services) on tax reform. Shortly, the UITP Working Group will issue a Statement to Government on tax options to encourage a shift from car use to public transport use.

I recommend that the Commission refer this taxation anomaly to the Minister for attention.

### **Facilitating the adoption of input saving technologies**

Government provide valuable information on ISTs, notably energy efficiency (but not 'transport energy'!). Examples of other ISTs, given in the Issues paper and this Submission, need to be made readily available.

I encourage the Commission to communicate with educational institutions and professional associations to facilitate greater awareness of ISTs.

Thank you.

## **Appendix – Chloe Mason – CV relevant to Productivity Commission’s Inquiry into performance of buildings**

Chloe Mason currently works on a part-time basis as Manager, UNSW Transport Program (since August 1998). The aim of this program is to improve transport accessibility to UNSW while reducing car use. It adopts a Travel Demand Management (TDM) approach. Transport is part of the UNSW’s Greenhouse Challenge Agreement covering fleet, parking and economic incentives, and trip generation management.

Her knowledge and experience in landuse-transport planning is also relevant to building patronage along public transport corridors and networking with other major trip generators in the locality to expedite the plans for a Maroubra rail line.

She is a frequent guest lecturer in academic programs on environmental health (the interaction between State and Local government policy), and by giving talks learns from other practitioners involved in the urban environment.

Between 1994-1999, Chloe worked for the NSW Environment Protection Authority and for much of her work there was about optimising environmental performance in urban planning & transport decision-making.

Previously, Chloe worked (and taught) in occupational health and safety and public health, and is conscious of how the design and management of buildings can improve well-being of users and avoid building-induced disease and illhealth.

### **Memberships:**

Associate Fellow Australian Institute of Management  
 Australian Institute Transport Planning and Management (member)  
 Public Health Association of Australia (member)

### **Formal academic qualifications:**

PhD (UNSW, 1986); MEnvStud (UNSW, 1994); BA (Hons 1st) (Macquarie University, 1972). Currently, studying law at the University of Technology, Sydney.

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