

Technical Research Paper 10

The Business Case for Sustainable Design



Study Outline

This study outline summaries key points raised in one of the 10 technical papers in the pre-occupancy study series that investigates the City of Melbourne's world leading Council House 2 (CH₂) office building. Each technical paper has been developed by independent authors from Australian universities as part of the CH₂ Commercial Green Building Technology Demonstration Project. To obtain copies of the full technical papers visit www.ch2.com.au

This project forms a major part of the CH₂ Study and Outreach Program – a coordinated effort to consolidate the various opportunities for study, research, documentation and promotion generated by the CH₂ office building. The primary aim of this program is to raise awareness of sustainable design and technology throughout the commercial property sector and related industries.

The target audience for these papers is professionals involved in the design, engineering, construction and delivery of office buildings, which explains the technical detail, length and complexity of the studies. Although these papers may be of interest to a wider audience, readers who possess a limited knowledge of the subjects covered should obtain further information to ensure they understand the context, relevance and limitations of what they are reading.

Significant funding for the technical papers was provided through an AusIndustry Innovation Access Program grant and supported by cash and in-kind contributions from the City of Melbourne, Sustainable Energy Authority Victoria, the Building Commission of Victoria, the Green Building Council of Australia and the CH₂ Project, Design and Consulting Team. The Innovation Access Program is an initiative of the Commonwealth Government's Backing Australia's Ability action plan.



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CH₂

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Study Outline – The Business Case for Sustainable Design

Costs and Benefits in Relation to ESD Buildings

The perceived increased cost of constructing a sustainably designed building, in comparison to a standard building, is commonly raised as a major obstacle for the uptake of ecologically sustainable development (ESD) in the construction industry. For many, the benefits of ESD are not properly understood. They believe upfront costs cannot efficiently be returned to the investor, even though the end user gains the benefit over the life of the asset. Therefore, ESD is often not seen as worth the extra cost.

The property and construction industry and its clients tend to focus on short-term gains rather than long-term savings or investment opportunities. As such, perceived higher incurred initial construction and maintenance costs are major obstacles to ESD, as they reduce returns to investors with short term investment interests.

The following is a summary of a paper examining the business case for sustainable buildings by specifically considering the case-study of the CH₂ building. In this respect it is hoped it will serve as an exemplar for proposed ESD projects in general, and other similar developments.

In Australia, concern for initial costs is reinforced from the development of buildings through to ownership and occupation of the building. Energy efficiency, for example, has not traditionally been considered a high priority for potential tenants, however this situation appears to be shifting. The emphasis industry puts on initial costs versus life cycle costs militates against ESD outcomes.

Inappropriate financing models, or lack of access to capital, also discourage investment in sustainable buildings. There is also no incentive to act, when the investor is often not the ultimate user who is responsible for energy bills. In addition, energy, like other business-related expenses, is tax deductible, and the plant and equipment that uses energy can be depreciated against taxable income. Lenders of capital also neglect environmental costs in their assessment frameworks.

As the property market is still unsure about the benefits of ESD, it is not usually reflected in the property valuation and analysis process. Using the concepts of price and worth, an outline valuation process has recently been developed to assist the valuer to take ESD into account through rent, capital growth and psychic income.

Research has shown that lessees are prepared to pay five to 10 per cent higher rent for improved comfort and control of the environment (Maguire & Robinson, 2000). Analysis of market evidence has shown there are some income benefits from owning and operating a socially desirable or 'landmark' asset. This phenomenon is known as psychic income, and can increase prices paid for properties by reducing the initial yield (Baum & Crosby, 1995). Taking all of these elements into account, a property exhibiting the highest environmental design and management principles can achieve a substantially improved property investment worth. However, these processes for capturing ESD benefits are not yet reflected in the general approach to estimates of market price.

Council House 2

The City of Melbourne's new staff accommodation, Council House 2 (CH₂), is a significant example of an ESD building. Due for completion in 2006, it has achieved six star world leader certification from the Green Building Council of Australia, the national body whose role is to define and develop a sustainable property industry in Australia, and drive the adoption of green building practices through market-based solutions.

The CH₂ building incorporates many innovative sustainable technologies in its design, including:

- phase-change materials for cooling;
- undulating high thermal mass concrete ceilings for passive radiant cooling;
- photovoltaic cells powering a façade of louvres;
- automatic night-purge windows;
- solar shading;
- shower towers for low energy cooling;
- roof top solar collection for water heating;
- green roofscape; and
- glare control.

The Need for New Accommodation

There are several reasons why the City of Melbourne decided to seek new staff accommodation. These include:

- to replace old accommodation at the end of its functional life, which no longer meets statutory regulations including occupational health and safety, and disabled access;
- to promote staff wellbeing and effectiveness; and
- to house staff in the same location (CH₂ – Business Case).

With the need for new accommodation clearly identified, it was decided it would be more effective to house staff in one building rather than spread over various Council leases. The City of Melbourne then developed a 'triple bottom line' business case for constructing a new green building with some clear financial, environmental and social objectives or drivers.

Financial Drivers

After the sale of the Council's share of the electricity supply company Citipower Ltd. in the mid 1990s, the City of Melbourne established an investment fund. Sale proceeds overall were \$200 million and the Council decided a portion of these funds could be invested in municipal projects which met the following criteria:

- the project must demonstrate a return of 150 per cent of the 10 year bond rate.
- funds can only be used for 'strategic' projects (Adams, 2004), such as those promoting the growth of Melbourne. This objective is considered further under social drivers.

In addition to the above, the specific financial drivers of the CH₂ project were:

- low risk, high return investment over a 50 year life;
- to 'future proof' or reduce the risks of the accommodation option chosen (CH₂ – Business Case).

After consideration of a number of different alternative accommodation options, it was eventually decided that the development of the new CH₂ building presented the lowest risk to the City of Melbourne. The total cost of the CH₂ building is estimated to be approximately \$51 million.

Specific estimated costs for the project are as follows:

- \$29.90 million for the base building excluding fit out and sustainability costs;
- \$11.30 million sustainability features;
- \$2.80 million demonstration and education process;
- \$7.1 million council specific requirements.

(Source: <http://www.melbourne.vic.gov.au/rsrc/PDFs/CH2/CH2FactSheet.pdf>).

The \$11.3 million cost for the sustainability features in CH₂ represent an investment premium of approximately 22 per cent for the project. This cost premium is higher than other ESD projects around the world. According to recent literature, 'green' buildings usually cost up to 12 per cent more than normal buildings, although the majority are less. However, it should be remembered that the CH₂ building has achieved the highest level of ESD certification from the Green Building Council of Australia, and could be expected to carry a higher sustainability price tag. Whether the 22 per cent premium is conservative or not is beyond the scope of this paper, although it does impact on the financial return of the investment.

Life cycle cost analyses were also conducted for various ESD features of CH₂ to estimate their effect on the long-term maintenance and operation costs. Expected savings from reduced energy and water usage, and increases in the effectiveness and well-being of the staff, emanating from the ESD features of the project were estimated. These are summarised below:

Estimated Savings for CH₂*

	Conservative		Optimistic	
	Savings (\$/yr)	%	Savings (\$/yr)	%
Effectiveness and well-being improvement	\$350,000	51	\$1,120,000	77
Energy savings	\$270,000	40	\$270,000	19
Water savings	\$60,000	9	\$60,000	4
Total estimated savings per year	\$680,000	100	\$1,450,000	100
Total current estimated savings over 50 years	\$34,000,000		\$72,500,000	
Discounted total current estimated savings	\$8.823m		\$18.813m	

* These figures are based on 2004 costs of salaries, energy and water. (Source: CH2 – Business Case, AEC, 2003)

The conservative figures above represent the minimum benefits that are to be expected from the CH₂ building, whilst the optimistic figures represent benefits that could "feasibly be achieved based on all the research assessed" (AEC, 2003).

Note the energy and water savings remain constant for both scenarios, reflecting a more certain status in comparison with effectiveness and wellbeing (productivity improvement). The conservative figures represent a non-discounted payback period on the premium paid for the sustainability features of approximately 17 years, and a discounted payback period of 41 years.

1 It should be noted that these are indicative studies only. In time, when ESD buildings are more acceptable to the market in general, their advantages will be recognised in the additional rent paid by tenants. However, the approach outlined above is suitable for consideration by owner-occupiers.

The optimistic figures represent a payback period on the premium paid for the sustainability features of approximately eight years, and a discounted payback of approximately 11 years.

Residual studies show that the land value for the conventional building is \$8.75 million and for the ESD building is \$0.3 million (conservative savings) and \$9.2 million (optimistic savings). This hypothetical study indicates that the worth of the ESD building (\$63 to 75 million) is substantially greater than its estimate price of (\$49 million), as suggested by the conventional building¹.

Environmental Drivers

In addition to the financial returns derived from reduced energy consumption, the City of Melbourne is keen to promote itself as a leading, green organisation in Victoria. In order to do this, the City has a number of environmental criteria to which CH₂ must conform, including:

- incorporation of the latest environmentally sustainable design features;
- 5 star energy level rating;
- a 20 per cent reduction of energy consumed in Council buildings by 2005 (based upon 1996 levels); and
- a five per cent increase in the use of renewable energy by 2005, and a 10 per cent increase by 2020.

Further, the City of Melbourne is keen to develop a landmark demonstration project of sustainable design to show how such a development can be integrated within the community.

Social Drivers

The business case for CH₂ also incorporates a number of social drivers that are informed by the City of Melbourne's local government role. As the City's responsibility to its ratepayer base must be considered in all of its decisions, the source of funding for the project was a prime consideration. The City reallocated assets within the investment portfolio to streamline the performance of the portfolio, and to ensure the project was fully funded by equity resulting in minimal risk to the ratepayers.

This funding option gave the City of Melbourne full control of all aspects of the property, in order to benefit from capital gain, and have no ongoing rental expenses apart from normal outgoings. In addition, this approach reduces risks to ratepayers through the long-term provision of healthy accommodation to staff, increased productivity, and reduced likelihood of civil action against the Council for poor indoor air quality, commensurate with potentially lower insurance premiums.

The City of Melbourne also believes the CH₂ redevelopment has the potential to develop retail business within Melbourne's CBD, by providing an integrated retail precinct linking the QV development with Collins Street and Federation Square. This could be done by incorporating retail and car parking facilities within CH₂.

In addition, the City believes CH₂ provides leadership and encouragement to the building and property industry, particularly in central Melbourne. The project is considered a "beacon type project on sustainability" (Adams, 2004), both in terms of its environmental aspects, and the potential health benefits for the building's occupants.

The City of Melbourne also sees the project as a means of boosting its responsibility to its staff. It is hoped the provision of a healthy working environment will promote the City as a responsible employer, and an employer of choice. This in turn is expected to reduce staff churn and provide additional financial benefits. Further, the business case for CH₂ includes genuine acknowledgement for staff wellbeing and satisfaction. For example, the CH₂ business case concludes:

"Many studies talk about the increase in productivity. This gives the perception that the outcome is for people to do more with less. This is not the intention of CH₂ or the City of Melbourne. Through a great work environment, fresh air, natural light, low emitting materials and greenery, the City of Melbourne hopes to create a healthy place to work. A place where, at the end of the day, you feel that you have achieved what you wanted – that you have been effective. With the added bonus that you have fewer sick days, less headaches, and feel good while you are at work."

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This is a publication of Melbourne City Council
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