Miller, E & Buys, L. (2008). Retrofitting Commercial Office Buildings for Sustainability: Tenants' Perspectives. *Journal of Property Investment & Finance*,*26*(6), 552-561.

Purpose: Buildings, which account for approximately half of all annual energy and greenhouse gas emissions, are an important target area for any strategy addressing climate change. Whilst new commercial buildings increasingly address sustainability considerations, incorporating green technology in the refurbishment process of older buildings presents many technical, financial and social challenges. This article explores the social dimension, focussing on the perspectives of commercial office building tenants.

Methodology/Approach: Semi-structured in-depth interviews with seven residents and neighbours of case-study building under-going green refurbishment in Melbourne, Australia. Responses were analysed using a thematic approach, identifying categories, themes and patterns.

Findings: Commercial property tenants are on a journey to sustainability. Tenants are interested and willing to engage in discussions about sustainability initiatives, but the process, costs and benefits need to be clear.

Research limitations/implications: The findings, whilst limited by non-random sampling and small sample size, highlight that the commercial property market is interested in learning about sustainability in the built environment.

Practical implications: The findings highlight the importance of developing a strong business case and transition plan for sustainability in commercial buildings. As sustainable buildings

become mainstream, tenants predicted the emergence of a ‘non-sustainability discount’ for residing in buildings without sustainable features.

Originality/value: This research offers a beginning point for understanding the difficulty of integrating green technology in older commercial buildings. Tenants currently have limited understandings of technology and potential building performance outcomes, which ultimately could impede the implementation of sustainable initiatives in older buildings.

Keywords: sustainability, office buildings, perceptions, retrofitting, tenants perspectives

Paper type: Research paper

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A key global challenge of the twenty-first century is how to tackle climate change and reduce greenhouse gas emissions (United Nations, 2007). With buildings estimated to account for approximately half of all annual energy and greenhouse gas emissions, one potential solution is to ensure the design, construction and maintenance of the built environment is environmentally sustainable (Brown *et al.*, 2005; Commission for Architecture and the Built Environment, 2007). Fortunately, there is a strong business case for sustainable or 'green' buildings, with a substantial body of work outlining the environmental, economic and social benefits; for example, a recent survey of over 800 green building owners, developers, architects, engineers and consultants in Canada and the United States concluded that '*green was good for asset value*', with green buildings perceived as outperforming conventional commercial buildings in terms of occupant wellbeing, building value and return on investment (Davis, 2005). Less clear, however, is whether and how existing buildings, which make up the bulk of commercial office accommodation, should be retrofitted and refurbished for sustainability. Thus, this paper explores the acceptability of retrofitting commercial office buildings for sustainability, focussing on the viewpoints, expectations and experiences of a small sample of commercial building tenants in Melbourne, Australia.

The appeal of green buildings

In the last decade, there has been significant international interest and support from governments, the construction and property development industry, private organisations and the general public for fostering a sustainable and climate-friendly built environment through building 'green', carbon-reducing buildings. Whilst definitions vary, a green building is one that "uses a careful integrated design strategy that minimised energy use, maximises daylight, has a high degree of indoor air quality and thermal comfort, conserves water, reuses materials and uses materials with recycled content, minimises site disruptions, and generally provides a high

degree of occupant comfort" (Kozlowski, 2003, p.27). Crucially, through the integration of innovative and efficient technologies, sustainable design approaches and environmentally sensitive site planning practices, the ecological footprint of new buildings is significantly reduced at a minimal financial cost (Kozlowski, 2003; Lucuik, 2005). Indeed, California's Sustainable Building Task Force estimates that "minimal increases in upfront costs of about 2% to support green design would, on average, result in life cycle savings of 20% of total construction costs -- more than ten times the initial investment" (p ii, Kats et al., 2003). These economic savings are achieved primarily through lower operations and maintenance costs, specifically lower utilities costs for electricity, water and waste disposal, although an emerging body of evidence has also highlighted how green buildings enhance the productivity and health of occupants (Kats *et al.*, 2003; Kozlowski, 2003; Lucuik 2005). Although precise statistics are difficult to obtain, green buildings are becoming increasingly mainstream and are estimated to currently comprise 10% of the new commercial building market in the United States and as much as 30% in Australia (Green Building Council of Australia, 2008).

The challenge of retrofitting existing buildings

Whilst there is increasing recognition that green buildings outperform conventional buildings in terms of a variety of environmental, economic and social indicators, much less is known about how green-building initiatives might be incorporated into existing buildings, which make up the bulk of the market. If the challenge of climate change is to be successfully addressed, therefore, this vast stock of older buildings (developed decades ago when sustainability was not a consideration) needs to be retrofitted. Unfortunately, retrofitting existing buildings is significantly more difficult than creating a new green building from scratch. For example, in existing multi-tenant commercial buildings, any sustainability retrofit or technology upgrade requires the cooperation and participation of a wide range of stakeholders (i.e., owners,

managers, occupants and contractors) who often must reside in the building during the potentially disruptive retrofitting process. Moreover, whilst there is the technological capacity, issues such as cost and tangible demand from consumers, organisations and policy-makers will determine the priority that industry places on retrofitting existing buildings for sustainability.

On the global stage, former United States President Bill Clinton has helped focus public attention on building retrofitting through his Clinton Climate Initiative (CCI, 2007) Energy Efficiency Building Retrofit Program. In an attempt to reduce energy consumption in existing buildings, the program brings together energy service companies, banks, and fifteen of the world's largest cities, including Melbourne in Australia. The participating city councils will retrofit buildings and develop incentives to encourage private owners to audit and retrofit buildings, with the energy service companies conducting audits to identify energy efficient opportunities and the banks financing these retrofits at no net cost (paybacks for the loans plus interest will come from future energy savings). Whilst initiatives such as these are designed to raise awareness and foster the implementation of sustainable interventions into existing commercial buildings, to date surprisingly little is known about the general marketplace's expectations, support and interest in sustainability retrofits. On one hand, in general, most people and organisations claim to be supportive of sustainability and initiatives designed to improve the environmental, economic and social effectiveness of their workplace (Lucuik, 2005). On the other hand, it is unclear whether organisations are demanding or will pay for such retrofits, which will almost invariably result in higher rents, at least in the short-term. Indeed, although recent research has explored the appeal of socially responsible property investment (Rapson *et al.*, 2007) and energy efficiency in the commercial property sector (Dixon *et al.*, 2008), researchers have not yet explored what commercial office tenants think about retrofitting commercial buildings for sustainability.

Thus, this exploratory qualitative research is designed to be the first step in developing the knowledge-base, focusing on identifying the perceptions and expectations of tenants, government officials and leasing agencies. The aims of this research project are three-fold. First, it explores tenant's experiences, beliefs and understandings, focusing on their knowledge of sustainable initiatives, design and technologies. Second, it identifies the key factors in building selection and the extent to which tenants are willing to pay a premium for a 'green rated building'. Third, it explores their expectations and predictions about the future of sustainable buildings.

Research Methodology

The target population for the project were residents and neighbours of a case-study building, which was undergoing refurbishment for sustainability, in the central business district of Melbourne, Australia. Built in 1979, the 7,008m² building consists of 11 upper levels of office accommodation, ground floor retail, and a basement area leased as a licensed restaurant. After refurbishment, which included the installation of chilled water pumps, solar water heating, waterless urinals, insulation, disabled toilets, and automatic dimming lights, it was expected that the environmental performance of the building would move from a non-existent zero ABGR (Australian Building Greenhouse Rating) star rating to 3.5 stars, with a 40% reduction in water consumption and 20% reduction in energy consumption.

Potential interviewees were contacted (via email and phone) and invited to participate in an in-depth face-to-face interview exploring sustainability issues in commercial buildings. Although

tenancy re-negotiations and sustainability retrofitting were occurring during the research process, there was a 50% response rate from the target building: five of the ten current case-study building tenants participated, as well as one state government representative and one leasing agent from neighbouring buildings. The building tenants were predominantly smaller, owner-operated businesses from a diverse range of industries (property, architecture, recruitment, professional associations for industry bodies, service delivery), with the seven interviews (one male, six females) conducted with the office manager, company owner or representative. Standard good practice interview and ethical protocols were followed, with the semi-structured discussion format interviews lasting between 45 minutes and 2 hours. The following key areas were covered: key factors influencing commercial building selection; experience in case-study building, including refurbishment process; knowledge of sustainable initiatives, designs and technologies; the relative appeal of sustainability and expectations for the future. Transcripts and responses were analysed using a thematic approach, identifying categories, themes and patterns (Liamputtong & Ezzy, 2005).

Research Findings

Sustainability – the future is green

All participants interviewed for this study acknowledged the growth in demand for sustainable buildings and expressed confidence that this trend would continue in the future. Participants reflected on the overall increasing awareness of the importance of conserving the natural environment and how, in the past year or two, sustainability issues had become a key political and community concern. In this context, making commercial buildings sustainable was seen as the responsible and 'right thing to do'. One participant commented that:

> Well, I don't think it the past people realised how much energy consumption was occurring in the environment as a result of commercial buildings, and there was a lot of pressure of individuals in the

> home. People sort of stopped and though 'hang on a minute – what about commercial buildings – what about work'?

Participants were all well-aware of the numerous social, economic and environmental benefits of residing in a sustainable commercial building. They described the environmental and economic benefits in terms of conserving waste, water and energy, although several noted that they would like to see a detailed breakdown of the costs and savings of specific sustainability features. From a social perspective, the shift in community attitudes and behaviours was noted, with engagement in environmental friendly activities expected at home and at work.

> The benefits – environmentally it is pretty obvious we are doing the right thing conserving energy and water and resources so that's the clear benefits. In terms of the cultural work too, it is sort of one of those things that it gets everyone out of their focus on themselves and their own little world and getting everyone thinking about the bigger picture. You're doing these little things everyday – and you know we all want to live in a better environment and keep everything and it is just something like a bigger goal that everyone is focused on. Not just your office but your building and the whole community is doing it"

With the media, government and major tenants increasingly publicising the benefits achieved by sustainable commercial buildings, participants felt that staff (especially the younger generation) were increasingly expecting to '*help save the environment at home and work*'. There was a feeling that residing in a sustainable building would assist with both staff morale and public perceptions, enabling their organisation to easily answer the question "*what are you doing to help the environment*?"*.* Having a sustainable office was increasingly viewed as a factor in recruiting staff, with several participants indicating that potential staff (primarily Generation Y) had asked in interviews what the organisation did to promote sustainability:

> I occasionally get asked about our environmental policy. They want to know what we do – if we have a social conscience. They want to know what we do for the environment, whether we give to charity and what charities we give to.

> To me it would be ridiculous to be looking after the staff's wellbeing without having environmental policies in place.

Prioritising sustainability - 'must do' vs. 'should do'

The relative importance of sustainability in commercial buildings differed considerably as a function of organisation size. Although all viewed sustainability as an important consideration, participants currently generally conceptualised it as a '*must do'* for government and a '*should do*' for private industry. For government and larger corporate tenants, sustainability was a critical factor and they *expected* to reside in sustainable and green star rated buildings. Sustainability was the norm and residing in non-sustainable buildings was *not an option*. Essentially, sustainability was a non-negotiable criterion in building selection for government and larger private organisations. To capture this market, some participants recommended that owners and landlords seize opportunities (i.e., vacancies) to integrate sustainable features and 'future-proof' buildings or they would be ruled out of the majority of the market in the future.

> Sustainability is very important – it reduces my outgoings which means I make more money – creates a better work environment which means my staff will want to come to work because the place is attractive, pleasant and comfortable. And I think consciously or subconsciously they feel that they are making a contribution because they are working in a work environment that is in a sustainable building. And the other thing is that I can say to my clients, this is part of my commitment

Smaller organisations described location and cost as the most dominant factors in building selection, although they viewed sustainability as an emerging consideration. Cost was described as the greatest barrier to sustainability, with participants expressing a desire to see detailed cost-benefit analyses and pay-back calculations of proposed technologies and, ideally, wished they could trial the technology first-hand in some way.

> Sustainability is probably not a crucial consideration yet – we haven't looked into it – it probably hasn't factored into any decisions at this stage. It is probably something we will look at in the future but not something we have looked at

Notably, although current tenants did not want to pay more rent, most were open to discussions about the implementation of sustainable initiatives, particularly those associated with reducing

energy (i.e., lighting and air-conditioning). In general, smaller organisations were relatively unaware and uninterested in cost-sharing arrangements and partnerships, such as green leases, which were perceived to be too complicated. Essentially, tenants were interested in finding out how to make the transition to sustainability in a cost-effective manner and wanted proof that sustainable initiatives would work and save them money:

> Convince me why this would be good for 'me' – I think it is always for 'me' first then the environmental benefit because it is really an all about me - society we are living in and the business definitely it is always at the bottom dollar

> As I said I think it [sustainability] is going to be a focus in the future – something that we don't look at for the moment. I would say right now – no, but certainly if it becomes an issue or an expectation then we would just have to align ourselves. I suppose it comes back to that cost factor – if it starts to become standard it would be acceptable

There were contradicting views about the role of legislation for sustainability. For most, there was an argument that the current drivers, such as information, rebates and incentives, were sufficient and legislation would be counter-productive, leading to skyrocketing rents. A few thought that the government would eventually legislate sustainability into commercial buildings, with one participant arguing; '*smoke alarms are compulsory, so should sustainability*'.

The fate of older commercial buildings

Although most felt that there would always be a place for older non-sustainable buildings, there was an expectation that *most would have to be retrofitted at some point to meet market expectations*. Retrofitting was viewed as a way to ''future-proof' for this inevitable change. Some felt that older commercial buildings could not be brought up to the ideal green standard and thus should be either demolished or turned into residential apartments. Others suggested that as sustainable buildings become mainstream, there may be a 'non-sustainability discount' for residing in a building without sustainable features. The argument was that as operating

costs (i.e., water & energy) would be lower in a sustainable building, there should be a rental subsidy in non-sustainable buildings to compensate for this. The extent to which this plays out in the marketplace will be apparent within the next decade. Overall, however, participants felt that traditional twentieth century buildings were not suitable for the twenty-first century, which was about sustainability.

For many participants, however, sustainability in commercial buildings was a relatively abstract concept. Although extremely interested in learning more, most participants reported relatively minimal knowledge of specific sustainability features, designs or products. Tenants were most interested in the more well-known sustainability features, such as smart lighting and air conditioning. However, they were unable to confidently state whether they wanted – or would pay for – specific sustainability features quite simply because their knowledge was limited. Indeed, in discussions about their knowledge of different sustainable technologies (e.g., smart/low energy lighting, solar hot water, waterless urinals and green rated carpets), participants often commented that they knew little about the technology, had not heard of it or were not sure exactly how it worked. Frequently, they described themselves as '*aware, but not knowledgeable*' about sustainable technologies. In addition, although generally supportive of green technologies, occasionally there were questions about whether there was the same standard of quality in services (particularly among the potentially less well tested and developing technologies) and demand for specific cost-benefit analyses.

> The only sustainable technology I know about is the energy side of things, which is something I am obviously aware of but all that other stuff is probably news to me

As the case study building was undergoing refurbishment for sustainability, tenants had-first hand experience of the process which they described as ongoing and quite disruptive. One commented that in an ideal world, tenants would move and there would be a full upgrade; in

this situation, they remained in the building whilst the initiatives were installed. The refurbishment process was described as never-ending, with some noting that if the installation of sustainable initiatives always took as long and was as disruptive they would have to think 'long and hard' about the cost-benefit balance:

> One thing we have noticed here is how disruptive the works in progress are – we've had constant clients come in and there is noise. And if someone said to us for the next five years to upgrade to get to a certain standard, there would be noise all the time …there would be some kind of consideration about leaving the building and obviously that wouldn't be so great for us because we would have to get another place but ultimately that building would be up to scratch eventually.

Precisely how existing building stock should be best retrofitted for sustainability was debated, with case-study building tenants emphasising the importance of retrofitting in a manner which is cost-effective and socially-acceptable (i.e., minimal impact on existing tenants). A clear priority was immediately obvious initiatives, such as smart/low-energy lighting and air-conditioning. One tenant also encouraged the owners and management to be innovative and 'think outside the box' in terms of retrofitting the building, possibly via the development of a roof-top garden and communal space. Overall, however, there was an acknowledgement that sustainability was growing issue, and that retrofitting was a way to ''future-proof' for this inevitable change.

Discussion and Conclusions

This exploratory research highlights how commercial property tenants, from predominantly smaller organisations, were on a journey to sustainability. On the one hand, there was general awareness of how the built environment contributes significantly to greenhouse gas emissions, with increasing support for sustainable commercial office buildings designed to improve efficiency, conserve natural resources, and reduce carbon emissions. On the other hand, although tenants were interested and willing to engage in discussions about sustainability

initiatives, knowledge was limited and they wanted significantly more information about the costs and benefits of sustainability designs, products and features, as well as details about the retrofitting process. Such findings highlights the value of ongoing generic industry and consumer awareness-raising activities, as well as the importance of developing and disseminating detailed cost/benefit information about specific sustainability initiatives that are common in commercial building retrofits, such as smart/low energy lighting, solar hot water, waterless urinals and green rated carpets.

Several other important themes emerged from this qualitative research. First, there was strong recognition amongst these tenants of the growing importance of the sustainability issue across the community and the likelihood that it will increase in the foreseeable future. With participants unanimously expecting sustainability in commercial offices to become standard in the next decade or so, making the transition to sustainability should be a priority for developers and owners. Already, larger private and government tenants will not consider non-sustainable commercial office buildings, with smaller tenants anticipating the emergence of a 'non-sustainability discount' for residing in a building without sustainable features. Such sentiments are consistent with research from the Green Building Council of Australia (2008) which foresees the emergence of a two-tiered property market, where sustainable buildings attract a premium and older buildings are discounted.

Second, whilst there was some recognition of the relevance of the built environment (and of their offices), the level of knowledge and the implications and options within their workplace and accommodation remains disappointingly low. Tenants reported limited understandings of technology and potential building performance outcomes, which ultimately could impede the implementation of sustainable initiatives in older buildings. Indeed, whilst most acknowledged

the advantages of sustainability, there was little interest in paying substantially more to access sustainable features. This may well indicate that despite the genuine interest in such improvements to existing buildings by property owners and managers, further work is still required to "sell the case" in a much more targeted and specific way that resonates with tenant corporations and the individuals and work groups who occupy the space. Smaller organisations wanted to see tangible proof and detailed cost/benefit analyses of specific sustainability features. With the marketplace reporting relatively limited knowledge of specific sustainability features, it is clear the business case needs to be further developed.

Third, unlike new buildings, the process of retrofitting existing buildings for sustainability can be extremely disruptive to tenants. This research highlighted how these tenants were tired of the ongoing process and desired a clear transition plan, outlining the timeline, information and cost benefits of each sustainable feature or new technology. It is important to note that whilst the business community, tenants and the media are quick to identify the obvious merit good of sustainable practices – particularly in the built environment - it is left to the asset owner and financier to take the risk in additional upfront investment in sustainable features in the expectation that this investment will be adequately rewarded in higher rents and in a lower risk profile into the future. Regardless of the ability of designers and constructors to create high quality sustainable built environment, such assets will only become mainstream when tenants demands stimulate changes in supply and to encourage the additional investment required to incorporate sustainable features in either new or existing assets. This research has highlighted that despite a basic level of enthusiasm and focus on sustainability, tenants currently have limited understandings of technology and potential building performance outcomes; ultimately, this limited knowledge could impede the implementation of sustainable initiatives in older

buildings. Clearly, there is a need for an innovative approach to tenant and occupant education regarding these issues, and particularly the cost benefit of them.

The limitations of our exploratory qualitative research need to be acknowledged, with further qualitative and quantitative research required to develop our knowledge-base. Our findings, whilst informative, are based on in-depth interviews with seven commercial building tenants from pre-dominantly smaller organisations residing in Melbourne, Australia. Whilst the financial cost of sustainability initiatives was clearly the key deciding factor for most participants, such considerations will most likely be less relevant for larger organisations who may view residing in a sustainable building as a relatively easy way to demonstrate their corporate social responsibility. However, as it is smaller organisations who reside in older buildings which are prime targets for sustainability retrofitting, this research offers a beginning point for understanding the difficulty of integrating green technology in older commercial buildings. Overall, traditional twentieth century buildings were not viewed as suitable for a twenty-first century focused on sustainability; the challenge is how to make the transition in a socially acceptable and cost-effective manner.

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