

The cost & benefit of achieving  
*Green buildings*



In this Info Data report, the second in a series of Davis Langdon's insights into Sustainability, we investigate the cost and benefit of achieving Green buildings



# Green buildings

## **The pursuit of Green ratings is becoming increasingly relevant to both building owners and tenants.**

Davis Langdon have examined the emerging design strategies being employed by developers and designers to achieve 4, 5 and 6 Green Star ratings, as well as capital and life-cycle cost implications in achieving the various Green ratings in commercial office buildings.

The conversion from 4 Star to 5 or 6 Star currently comes at a cost, but results in a more appealing building to investors and occupiers and meets rising expectations of the market.

Davis Langdon is seeing rapid change in priorities in the construction industry in Europe, North America, Asia and Australia, with sustainability and the issues of global warming and resource conservation quickly becoming high priority subjects at all levels of government and business.

### **Benefits for building owners include:**

- › potential higher occupancy rates
- › higher future capital value
- › reduced risk of obsolescence
- › less need for refurbishment in the future
- › ability to command higher lease rates
- › higher demand from institutional investors
- › lower operating costs
- › mandatory for government tenants
- › lower tenant turnover
- › costs less to maintain and operate

A Green building, either of new or refurbished stock, can be delivered in many ways; however we see the key drivers as Energy and Water focused solutions, with these being favoured in the quest for a 5 Star solution or greater.

Achieving high Green ratings also acts as a safeguard to minimise the effects of future energy price increases – the impact of which should not be underestimated.

Investors are increasingly seeing socially responsible investment as a priority and developed countries are increasingly recognising carbon emissions as a real cost. The importance and awareness of such non traditional costs is growing, with many companies and individuals concerned about greenhouse gas emissions and climate change. If, in the future, a tax is imposed on energy consumption, a more energy efficient building will incur a lesser impact.

Needless to say, government decisions on carbon trading and tax implications will have a significant impact looking ahead, however, policies are yet to be formed. A growing public knowledge of the impacts of climate change is gathering momentum, and this shift in public opinion will be the driving force of future policy.

*In the USA a Davis Langdon study shows projects of similar nature often cost at different rates due to many drivers; but Green is not one of them.*

# Our Research

**Our research indicates that at present, the initial impact on construction costs (above comparable non Green projects) is likely to be in the order of 3 – 5% for a 5 Star solution, with an impact of a further 5% plus for a 6 Star non iconic design solution.**

Our research is based on a building greater than 15,000m<sup>2</sup> NLA which complies with PCA's *Guide to Office Building Quality*. It assumes:

- › a build, own and operate model is used based on a 15 year holding period
- › rental is on a Gross Lease Rental basis with rental growth of 3.5% per annum
- › an Internal Rate of Return (IRR) of 11% has been used in the calculations
- › escalation rates of 3% for construction costs and 3% for Energy

In addition, other normal allowances have been used as part of the feasibility calculations.

This equated to an initial impact of approximately \$19/m<sup>2</sup> NLA/pa for a potential change from 4 to 5 Star and \$40/m<sup>2</sup> NLA/pa for a potential change from 4 to 6 Star.

Reducing the capital costs whilst maintaining the target Green rating involved the re-prioritisation of construction

costs. This included the maximisation of consequential offsets arising out of design (eg reduced riser area, reduced floor to floor height etc) and the evaluation and prioritisation of the Green attributes where possible above other features of the building.

However, over time and assisted by the inclusion of environmental requirements as part of the PCA's *Guide to Office Building Quality*, this perception of 'extra' cost will diminish as the design strategies employed become 'the norm'. That is to say 'business as usual' cost will rise.

In the pursuit of marketplace differentiation, we are likely to see more cutting-edge design solutions pushing the boundaries of innovation.

The goal of ever-greener buildings by committed building owners and investors will lead to a greater focus on the life-cycle benefits of the technologies and design strategies, assisting the financial evaluation of the various attributes beyond the initial capital cost impacts.

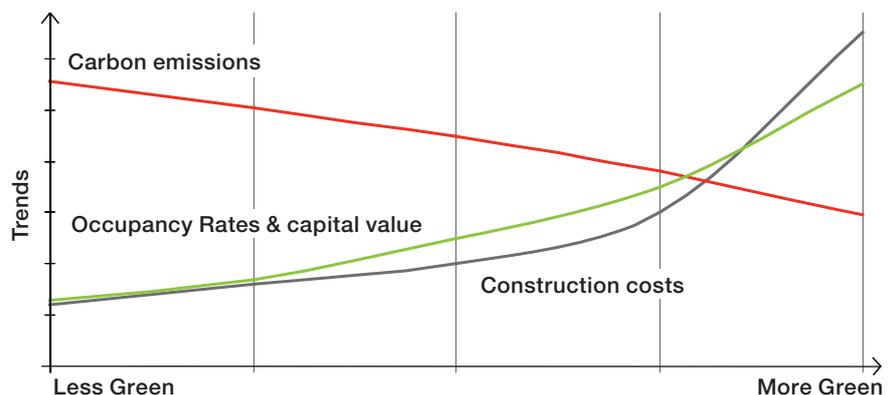
It should also mean that design teams will need to work harder to evaluate and balance Green initiatives, look for off-sets and prepare well measured arguments to ensure the attributes are maintained through to construction.

## Initial impact on construction costs

	Percentage	Average \$m <sup>2</sup> GFA (excluding development on costs)
4 Star - Green Star (per PCA Guide)	0%	\$0
4 Star to 5 Star - Green Star	3% to 5%	\$98
4 Star to 6 Star - Green Star	9% to 11+%	\$203

## Additional gross rental required

	Initial Impact on Construction Costs (average) \$m <sup>2</sup> GFA	Additional Gross Lease Rental Required to Achieve 11% IRR \$m <sup>2</sup> NLA/pa
4 Star - Green Star	\$0	\$0
4 Star to 5 Star - Green Star	\$98	\$19
4 Star to 6 Star - Green Star	\$203	\$40



# What's driving Green strategies

The inclusion of environmental requirements as part of the PCA's *Guide to Office Building Quality* will impact on building owners across Australia. New Premium Grade and A Grade buildings will need to meet a minimum of 4 Star Green Star and 4.5 Star ABGR.

As such, Green design strategies are set to become 'the norm' for higher quality buildings, and the perception of 'extra' cost will diminish. Some industry commentators are already claiming that the market is moving toward 5 Star Green Star as the base standard for a marketable building.

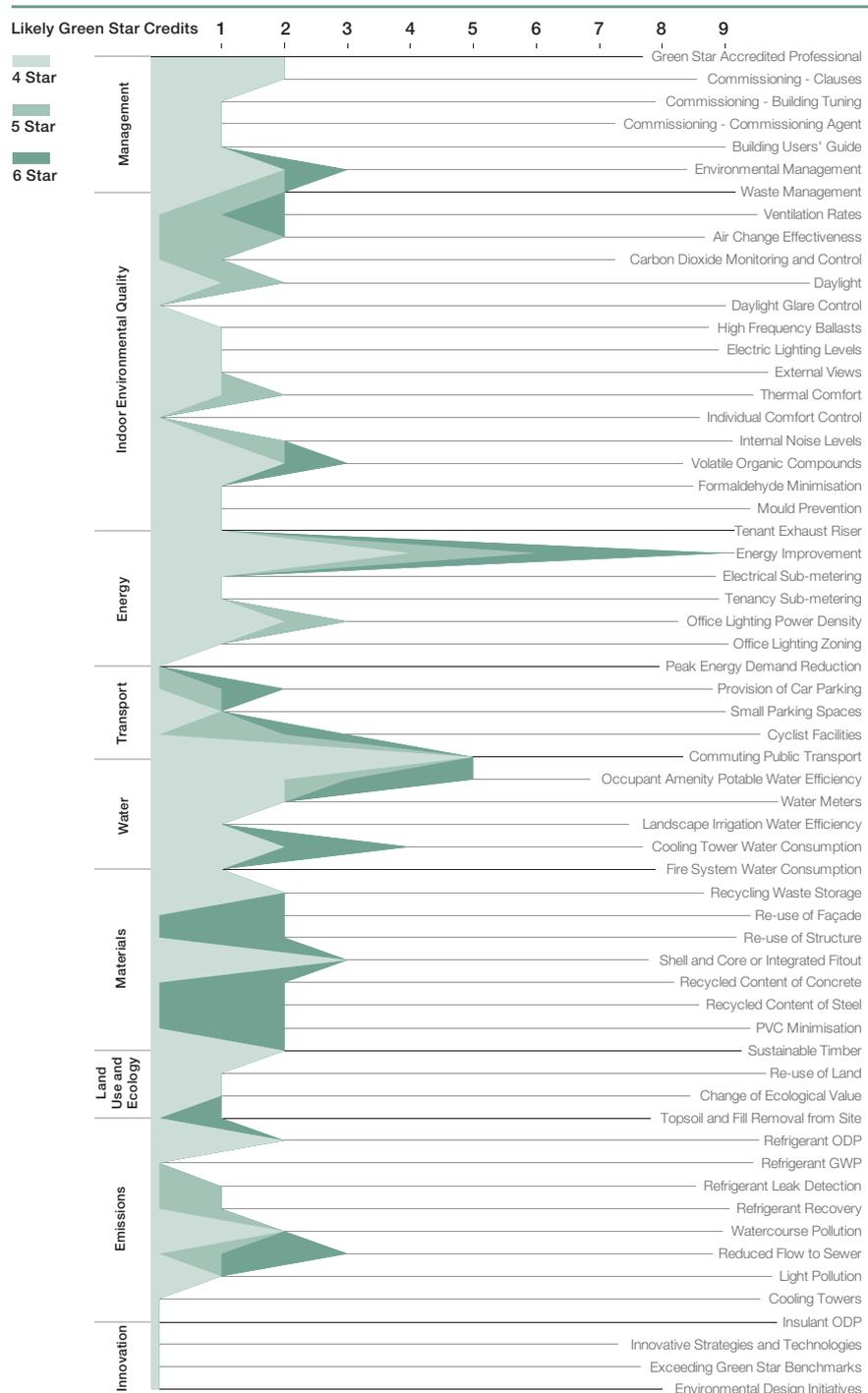
The approach for a 4 Star Green Star solution can be achieved fairly simply by adopting readily attained credits available for Management, Indoor Environmental Quality,

Energy, Transport, Water, Materials, Land Use & Ecology, and Emissions.

The approach for a 5 Star Green Star Solution will tend toward either an Energy reduction or Water reduction approach. At this level, an Energy centric approach might involve passive chilled beam air conditioning and reduced floor to floor heights.

Alternatively a Water centric approach is likely to include recycled water and grey / blackwater plant.

A 6 Star solution will need to consider a combined Energy and Water reduction approach, which is likely to include all of the above, along with demonstrating innovation, emerging technologies and therefore, a greater focus on life-cycle benefits.



Source: Green Building Council of Australia Technical Manual Green Star Office Design Version 2

# The cost of 'not' going Green

**Two factors which will profoundly change the way we think about Green ratings are Energy and Water.**

The public's perception of Green has changed in recent years. The drought has crystallised the issue in the minds of the general public – almost everyone being affected by the water restrictions and the impacts on their gardens.

There has been a diametric shift from the 'tree hugging hippy' greenie image to a mainstream awareness of environmental issues which has permeated into almost every home. Awareness is also being raised amongst children who are taught about the need to conserve water and instilling the next generation with an environmental consciousness at a very early age.

This raised awareness also permeates into the workplace. Employees are seeing the advantages of working in improved environments which in many cases equates to working in a Green building.

Publicity surrounding the improved working conditions provided by some companies will have a trickle down effect within the workplace. In a time where labour and skills shortages are on the increase the retention and productivity of staff is going to be of increasing importance.

Recently, at the *Global Roundtable on Climate Change*, executives from a range of industries including air transport, energy and technology, called on governments to set targets for greenhouse gases and carbon dioxide emissions. The group includes more than 100 of the world's largest corporations: Ford, General Electric, Toyota, Alcoa, investment bank Goldman Sachs and retail giant Wal-Mart.

With the developed world increasingly recognising carbon emissions as a non traditional but real cost, there is a growing likelihood that a carbon tax will be imposed on energy consumption.

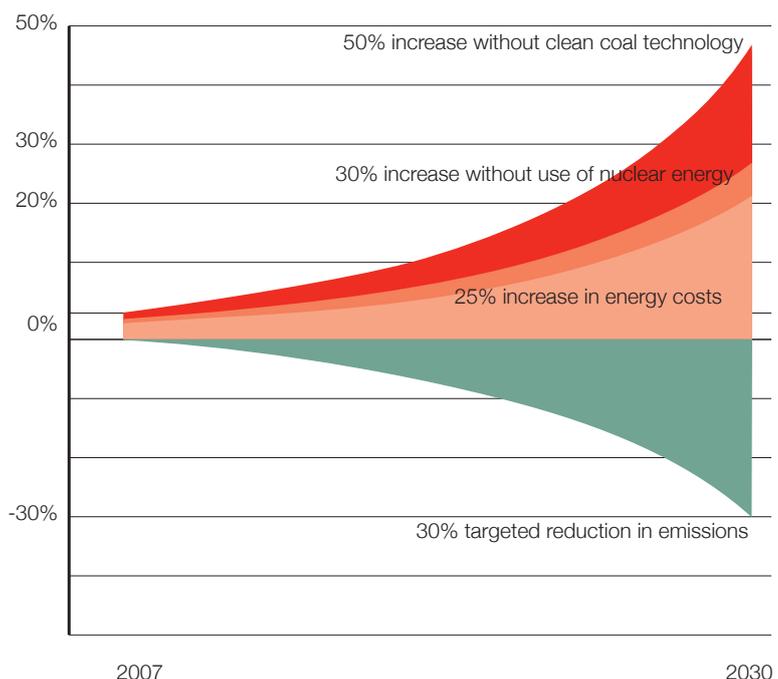
The intention: to deliver incentives to switch to more environmentally friendly production and consumption of energy.

The logical progression from carbon taxes is a carbon trading system. Under an emissions trading scheme the 'cap' on emissions sets out what level of reduction is necessary under the program. The number of permits issued each year are lowered annually, encouraging the take up of clean or renewable energy.

In whatever form a new tax is imposed, a more energy efficient building will incur a lesser impact – acting as a safeguard to minimise the effects of future energy price increases.

*Carbon emissions trading will make an impact*

Cost of Energy 2007 - 2030



According to the Energy Supply Association of Australia

# Energy - there are alternatives, but it is early days

Arguably, many of the energy consumption issues we are facing today have come about as a result of cheap energy. However, as we move forward the impact of energy cost increases will start to make a significant impact on alternative energy.

The rush is already on to find a sustainable large scale alternative to coal. Globally, alternative power options are being utilised to varying degrees, from wind to hydrogen, solar, clean coal and nuclear. Even geothermal power - generating superheated steam from deep beneath the earth's surface - may become an option in the near future. These are but some of a long list of initiatives that may be considered.

### A waterless future

A waterless future ultimately means cost increases: desalination, recycled water, third pipes, grey water, black water, water tanks, etc.

Irrespective of the chosen solution to Australia's growing 'water crisis' the fact remains that water is going to get more expensive. Water falling out of the sky is cheap. Considerably cheaper than, for example, water falling from the sky into the sea, harvested and desalinated.

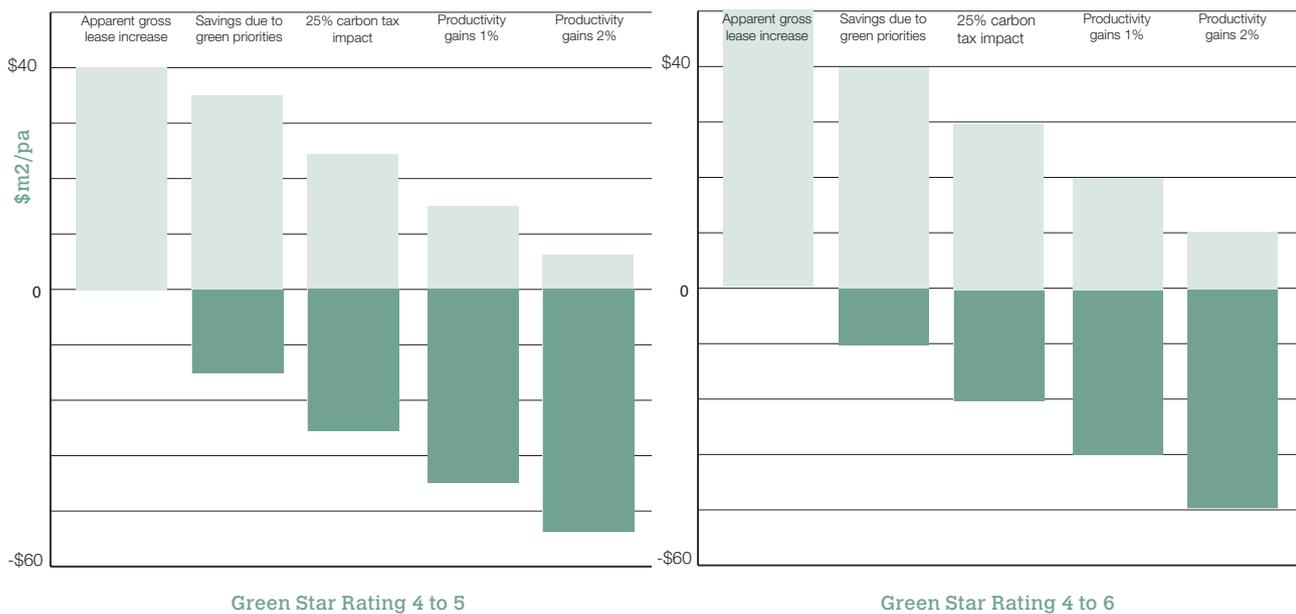
### Productivity

Keeping in mind that the greatest cost to business is that of salaries, any improvement in productivity, through occupant comfort, lighting, temperature and increased natural ventilation, etc will have a major impact on the bottom line.

The Building Commission of Victoria indicates that optimal levels of Indoor Environmental Quality would increase Australian workforces' productivity by 30%.

There is still a lack of consensus about productivity benefits derived from Green buildings: whilst 'real' in the short term – little long term research has been undertaken regarding the ongoing productivity benefits obtained from Green buildings. We have taken the view that the capital cost and 'real' operational / recurrent benefits will need to speak for themselves and the benefits of productivity will be an added bonus, but are unlikely to be the deciding factor when assessing the viability of the Green business case. More emphasis needs to be given to Life-cycle Assessment (LCA) in the assessment of ESD attributes.

## Consolidated view of the impact on the gross lease rental



Explanatory note: The compounding financial benefit of each Green component offsets the apparent gross lease increase

# Going Green is 'future-proofing' your asset

**The looming obsolescence of non Green buildings is powering strong interest in Green. Major super funds, trusts and listed property vehicles are realising that meeting corporate sustainability objectives, for themselves or their tenants, is a long term 'value add' for their asset. Obsolescence means that non Green buildings will decrease in value.**

The market has struggled to calculate the value of Green buildings, because Green building benefits such as longer lifespan, reduced replacement and lower operating costs are not easily expressed when accounting methods use depreciation only. Valuers, still asked to value in accordance with accounting standards, struggle to accurately value Green buildings.

The move away from financial modelling that focuses on payback (capital cost reduction) towards life-cycle costing (energy efficiency, employee productivity, etc) is revealing a more accurate picture. There is now sufficient evidence in the market to suggest that Green buildings are more valuable.

## Conclusion

The conversion from 4 Star to 5 or 6 Star currently comes at a cost, but there is sufficient evidence in the market that sustainable buildings make good business sense.

Responsible development is in line with growing community expectations and complies with emerging socially responsible investor requirements. They result in a more appealing building to investors and occupiers and meet rising expectations of the market.

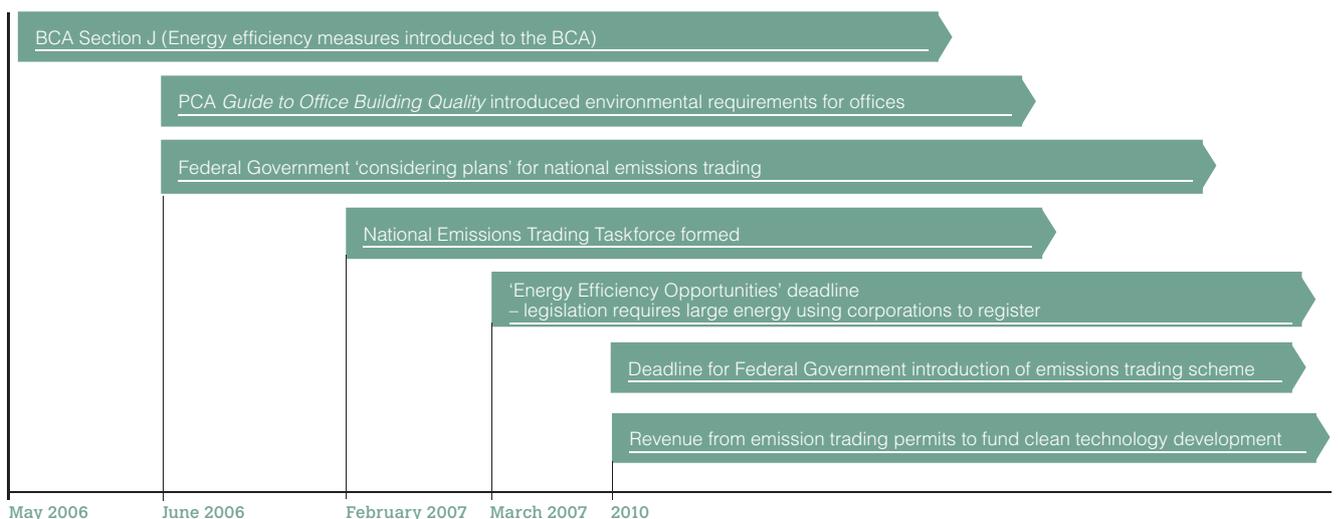
Occupants benefit from a healthier, more enjoyable working environment and this subsequently secures more rental certainty for building owners through higher occupancy rates, lower tenant churn and potential to deliver a rental premium.

They are likely to have less need for refurbishment in the future and subsequently a reduced risk of obsolescence. And by reducing carbon emissions they act as a safeguard to minimise the effects of future significant energy price increases.

Many aspects of Green buildings such as natural ventilation and daylight are not great leaps of innovation, but rather, basic fundamentals of good design: elements that have been overlooked over time. Emerging technologies are being incorporated into buildings to push the boundaries – but Architects and Engineers have been doing that for years.

The goal of ever-greener buildings by committed building owners and investors is already leading to a greater focus on the life-cycle benefits of the technologies and design strategies, shifting the focus of the financial evaluation beyond the initial capital cost.

## Implementation timeline



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