Value-for-money tracking Guidance Note

What is value-for-money tracking?

Value-for-money tracking refers to an activity in which the value (interpreted broadly, potentially including quantitative and qualitative value) and cost of sustainability initiatives beyond standard University practice are estimated at key project stages. The purpose of this activity is to:

- Help project teams and the University to prioritise possible initiatives
- Increase institutional understanding of how projects contribute to the University's objectives
- Increase institutional understanding of the cost impacts / benefits (if any) of sustainability initiatives

The University's strategic direction

Through an Estate Plan and Strategic Asset Management Plan, the University is putting increasing efforts into aligning the University's strategic objectives and the way its Estate is designed, built, operated and maintained. Tracking the value-for-money of proposed sustainability initiatives contributes to these efforts.

Approaches for projects

At this time, the University does not have a prescriptive approach for how value-for-money should be tracked.

An example of one way that this might be done is provided for the Arts West project:

- TEMC 2015 paper – "University of Melbourne's Arts West Redevelopment – A case study in value-for-money sustainability"

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UNIVERSITY OF MELBOURNE'S ARTS WEST REDEVELOPMENT - A CASE STUDY IN VALUE-FOR-MONEY SUSTAINABILITY

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ABSTRACT

Green Star is an environmental rating tool that is used by many Universities to set minimum sustainability performance for their buildings. While the intentions of Green Star are admirable, many hold the view that Green Star does not always add value to a project, for example due to inappropriate design approaches and poorly implemented technology. Recognising this, for the Arts West Redevelopment at the University of Melbourne's Parkville Campus, the authors trialled a process that actively sought to make the design rationale transparent and achieve the 5 Star Green Star rating in a value for money manner. The paper finishes by reflecting on the extent to which the success of the approach used on this project was dependent on the specific project team and site, and whether it could also be successfully applied to a wider range of projects.

KEY WORDS

Green Star; sustainability; buildings; value for money

INTRODUCTION

Green Star is an environmental sustainability rating framework for buildings that is used by many universities to guide the design of facilities (e.g. Monash University, c2013; University of Melbourne, 2013; University of Tasmania, 2015). At the time of writing there are at least 57 tertiary education projects that have registered for or achieved Green Star ratings (GBCA, 2015).

While Green Star has provided a tremendous boost to the sustainability of the built environment over the past decade (GBCA, 2013a; GBCA, 2013b; GBCA, 2014), it has received criticism over the years from various stakeholders and commentators of having: limited industry impact, ineffective outcomes, perverse outcomes, excessive documentation requirements and inconsistent assessment (Owen, 2006; GBCA, 2007; GBCA, 2007a; GBCA, 2008; GBCA, 2013c; GBCA, 2013d; van der Heijden, 2014; Perinotto, 2014). The GBCA has recognised this and responded with a number of changes for the better (GBCA, 2011). However, this is only part of the solution. Design teams must shoulder some of the responsibility for the implementation of sustainability.

Healey (2014; 2015) describe one practitioner's ongoing action learning to improve the way that sustainability is incorporated into building projects. Methodologically, the action learning approach is characterised by cycles of planning, acting, observing and critically reflecting in real world settings in collaboration with stakeholders (Koshy, Koshy, & Waterman, 2011), making it well suited for use on building projects. It has the potential to simultaneously contribute to knowledge and practice, although because the learnings are situation and context specific, care needs to be taken in making generalisations (Koshy, Koshy, & Waterman, 2011).

Recently, the action learning approach was applied to the use of Green Star on the University of Melbourne's Arts West Redevelopment. The outcome of this action learning cycle is an approach to Green Star strategy and costing that has the potential to lead to more transparent, supported and effective sustainability decision-making than is typically the case.

The paper begins with an overview of Green Star, noting relevant aspects that affect project outcomes.

This is followed by a summary of the typical approaches taken by consultants to develop Green Star strategies and by Cost Consultants to estimate costs. These sections identify some of the issues with the typical approaches.

The paper then shifts focus to Arts West, starting with an overview of the project before detailing the Green Star strategy and costing approach that was used and how it responds to some of the issues noted with typical approaches.

Following the case study, we critically reflect and answer two key questions:

1) Was the approach an improvement on typical approaches?
2) Can the approach be applied to other projects?

OVERVIEW OF GREEN STAR

Green Star is an environmental rating system for buildings and community developments (GBCA, 2013e). It is used by many organizations, including universities, to set standards and demonstrate commitment to environmental performance.

Ratings are available for almost any building type and in the areas of design and construction of new buildings or major refurbishments, interiors, operations and maintenance, and communities. Star ratings are awarded in design and construction for Best Practice (4 Star), Australian Excellence (5 Star) and World Leadership (6 Star). Projects are awarded a rating based on a multi-criteria assessment of environmental performance in the areas of management, indoor environment quality, energy, water, transport, materials, land use and ecology, emissions and innovation. Each of these categories has a number of credits, points being awarded within each credit if set benchmarks are achieved.

The design initiatives and mix of credits used to achieve a rating are at the discretion of the project team, which in the best case enables the design and rating to be aligned to

all the project objectives, or in the worst case, to be biased towards the cheapest and easiest initiatives with limited regard for what is appropriate. This will be discussed further in subsequent sections.

SOME ISSUES WITH TYPICAL APPROACHES TO GREEN STAR COSTING AND STRATEGY

The first step in action research is planning. Healey (2014; 2015) developed ideas about ways that Ecologically Sustainable Design (ESD) could be better implemented on projects and saw an opportunity to test these ideas on the Arts West project. The following sub-sections provide background to help readers to understand some of the issues with typical approaches and the ideas for improvement that were tested.

Approaches to costing

There are three basic approaches to costing ESD initiatives in building projects:

- Percentage Allowance
- Included in the detail
- Detailed Costing

These are summarized in Table 1 along with their pros and cons.

Table 1 – Approaches to costing ESD initiatives

Approach	Potential Pros	Potential Cons
Percentage Allowance A percentage allowance is included as an extra over cost to the project, typically in the summary	• Can be applied when little to no information is known • The extra over cost for a particular Green Star range is clearly defined • Easily benchmarked against similar projects	• The details of the individual points are not known, therefore reducing the ability to undertake a cost/benefit analysis • Does not take into a/c the particulars of the proposed project
Included in the Detail The cost of all the ESD initiatives are priced and included in the detail of the cost plan, but are not identified as costs beyond standard practice	• It is clear that all the items have been priced and included • Can reduce temptation for ESD cost cutting because the ESD specific costs are not separated out	• Cannot identify the extra over cost of the ESD rating • Difficult and/or risky to apply when the Green Star Strategy hasn't been fully resolved • The costs of the individual points cf. to standard practice may not be known, reducing the ability to undertake a cost/benefit analysis
Detailed Costing The ESD initiatives are priced along with standard practice and the allowance is shown separately	• Clarity that everything has been priced and what that premium is • Potential to undertake a cost/benefit analysis	• Difficult and/or risky to apply when the Green Star Strategy hasn't been resolved • Requires consensus regarding what is 'standard' practice vs a green premium. • Could require more work

Generally the cost consultant decides, at least initially, which approach or combination of approaches they will use for ESD costing at which stage of the project.

It is not uncommon for the cost plan during design to indicate that the project is over budget. The typical response is a process known as value management, which often struggles to transparently consider and reconcile value in all its forms across all aspects of the project. At this stage, the ESD / Green Star strategy, even if initially targeted to deliver greatest value to the owner/end-user, may be changed to a reduced-cost approach.

Approaches to developing a Green Star strategy

In our experience, there is not a standard method for developing a Green Star strategy across the industry. There are however some common characteristics worth noting:

- Cost is always a significant, and often the dominant, driver
- Other considerations may include technical complexity, risk, spatial requirements, compatibility with functional requirements and architectural intent, and innovation that will differentiate the development.
- The project location can sometimes provide easy points e.g. proximity to public transport.
- It is not uncommon for Green Star strategies to focus on the technologies to be implemented, rather than the outcomes that should be delivered during operation.
- It is common for strategies to be presented in terms of environmental impacts (like the Green Star framework is) rather than desirable outcomes (Healey, 2014).

One criticism that is significant for this paper is that Green Star doesn't necessarily lead to better outcomes in practice. In Healey's experience, this has historically been partly to do with the Green Star framework itself, specifically rigidity in assessment and in the past a bias towards technological solutions for higher ratings, combined with the design and construction industry climbing a steep learning curve (Healey, 2011).

Even if the project team initially develops an appropriate Green Star strategy, value management and / or Design & Construct procurement can dilute or override the original intent. It is not uncommon for example, for head contractors to commit to achieving the overall Green Star rating but reserve the right to change the mix of credits targeted. Some level of flexibility is not unreasonable, but in these situations there is a risk that the cheapest and/or most expedient initiatives becoming implemented, rather than those providing best value-for-money for the institution.

This issue is captured well by Monash University (2013), reflecting on their experiences with Green Star:

'*The project groups using the Green Star framework often select categories that are the cheapest and easiest to implement to achieve the star ratings, rather than implementing design features that would benefit the University in the longer term. An example occurred with the third building where cogeneration was chosen over improvement to the façade.* '

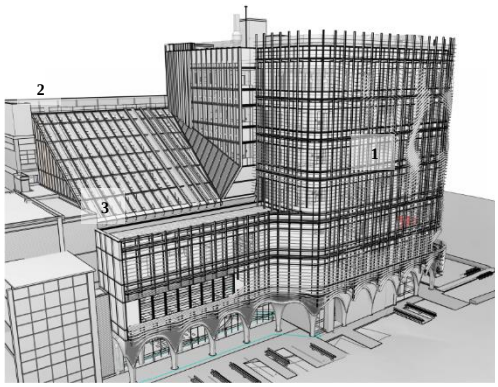
ARTS WEST ESD COSTING AND STRATEGY APPROACH

The second key step in action research is to put the plan into action – in this case to test the ideas for improvement on a real project. We'll start with an overview of the project, followed by some specifics about what we did.

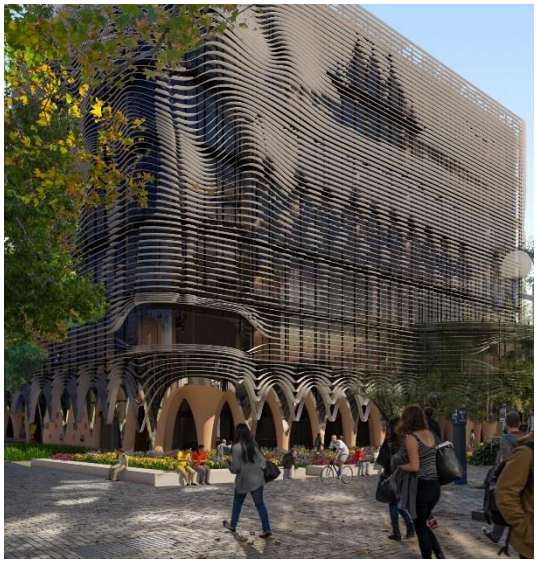
Overview of Arts West project

The Arts West Redevelopment is a $66m project involving the demolition of an existing building located on the University of Melbourne Parkville Campus. The demolished building is being replaced with a new building consisting of a ground floor gallery, 5 levels of teaching spaces and an upper level of staff and researcher offices. Immediately to the south of the new building is a courtyard, called Professors Court, which will become a naturally ventilated atrium space. Some minor superficial refurbishment of a few floors of the adjacent 1990s building will occur at the same time. The new building will have an iconic shading system, as shown in Figure 1. The University's brief was for a 5 Star Green Star Design rating for the new building.

Existing buildings (Source: Apple Maps on iPad)
(1) Building to be demolished
(2) 1990s building for minor refurbishment
(3) Professors Court



Proposed design (Source: ARM + Architectus)
(1) New building
(2) Refreshed 1990s building
(3) Atrium over Professors Court



Proposed external view (Source: ARM + Architectus)

Proposed internal atrium view (Source: ARM + Architectus)

Figure 1 – Arts West Redevelopment images

Arts West Green Star strategy and costing approach

From the outset, Arup sought to address some of the issues associated with the typical approaches to the development of ESD strategies. Slattery were a supportive partner in this, and together led the project team through what was expected to be a better approach than typical, summarized in Table 2. The project team contributed in various ways as noted in the table, with the building services engineers, LCI, playing a crucial role with regards to cost estimates of building services items.

The key outcomes were:

- A Green Star strategy that was supported by the project team and University stakeholders, and which cost $875,000 less than the typical ESD cost for a 5 Star project of this scale.
- Some credits were targeted because of their value to the University, even though they were more expensive than some others available (i.e. the process resulted in a different outcome than if a least-cost approach was taken).
- Feedback from the architect and external project manager that the process had run very smoothly.

Table 2 – Summary of the ESD value and costing approach used in the Arts West Redevelopment
(Final Green Star strategy agreed and approved by the University and project team.)

Project phase		Arup	Slattery	Other project team members
Concept design	1	Arup prepared an initial Green Star strategy which focused on credits that were technically and functionally appropriate. 73.5 points were taken forward at this stage, which is a 22.5% contingency on the 60 points required for a 5 star rating. Arup facilitated user group discussions to understand the University's experience with Green Star buildings to date – what has worked / not worked.	Slattery included a percentage allowance in the budget because the Green Star strategy was not known. This defined a clear budget that would later be further tested and rationalized.	The University and design team members prepared the functional brief and concept designs.
Schematic design	2	Arup, Slattery and LCI (building services engineers) allocated cost estimating responsibility for each credit in the preliminary Green Star strategy. Each responsible party then estimated the cost beyond standard practice or brief requirement (i.e. what would occur in the absence of Green Star) for each credit.		
	3	Arup qualitatively estimated the non-environmental value of each credit in terms of enhancing core business, reducing cost, responsibility and reputation, and risk. Environmental value was taken as being measured by the Green Star points for each credit.		
	4	Arup combined the cost and value data to better understand the implications for the project and University of each credit. Refer to Figure 2, Figure 3 and Figure 4.		
	5	Arup made a recommendation about which credits to carry forward in the project and which to drop. 69 Points targeted at this stage (15% contingency)	Slattery reviewed the (positive) impact of no longer targeting the credits recommended by Arup. The rest of the project team and University stakeholders reviewed (or had the opportunity to review): • the implications of the credits being targeted • Arup's estimates of value for each credit	
Tender documents	7	Arup prepared a Green Star section for the D&C tender documents which gave an overview of the Green Star strategy and the role that value to the university played in developing it. It included a requirement that any changes proposed by the Contractor had to include a review of the impact on 'value'.		PM / University included Green Star section in Contract preliminaries.

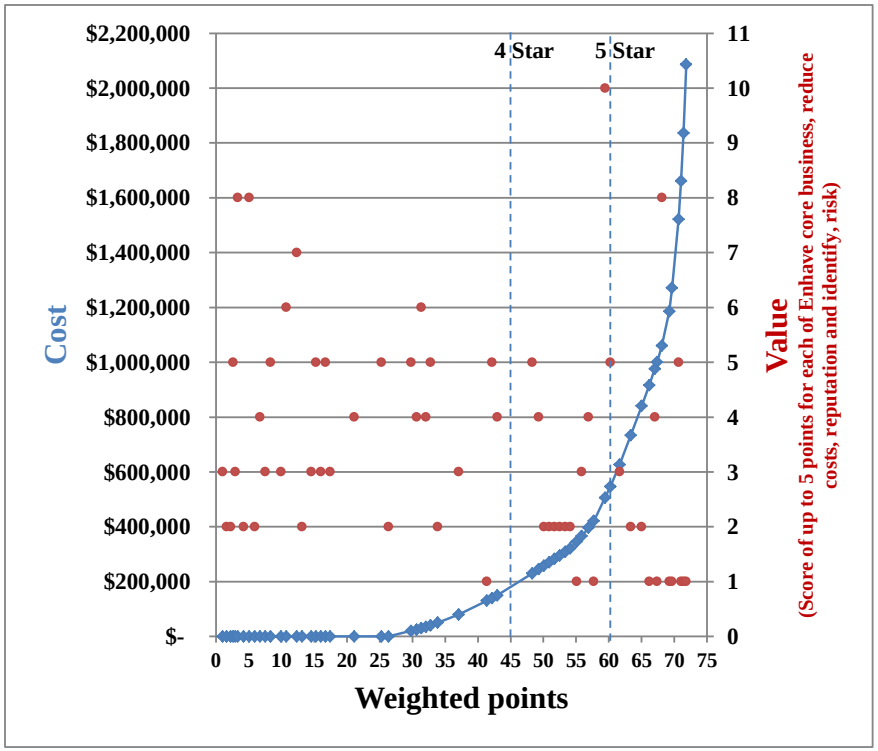


Figure 2 – Green Star points ordered cheapest to most expensive

The chart shows the exponential increase in cost to achieve higher total points.

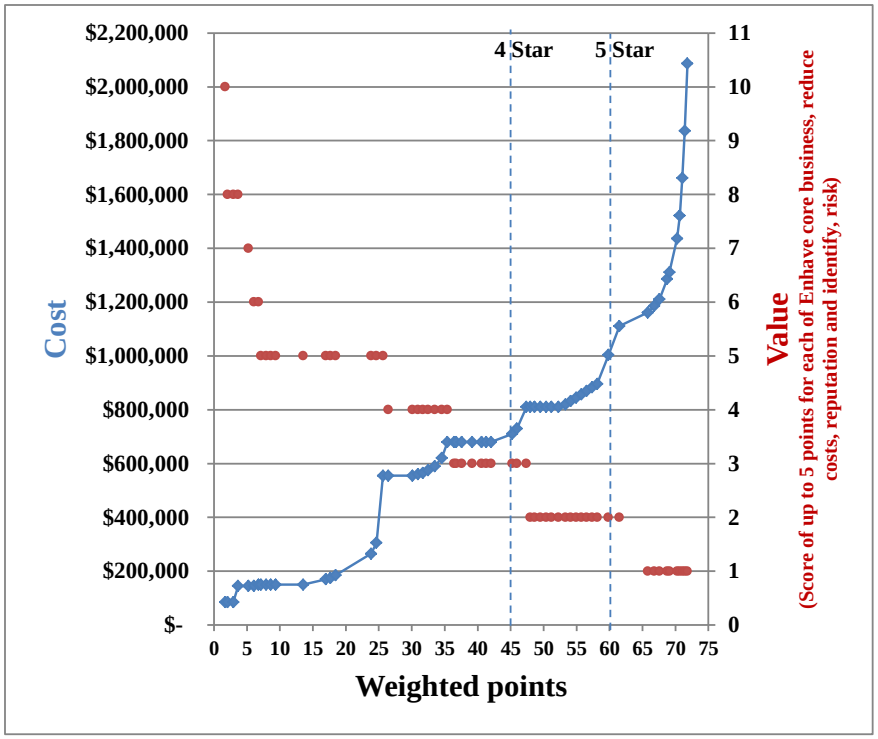


Figure 3-Green Star points ordered highest value to lowest value

Value was estimated by awarding each credit a score of up to 5 against categories of: enhance core business, reduce costs, reputation and identity, and risk.

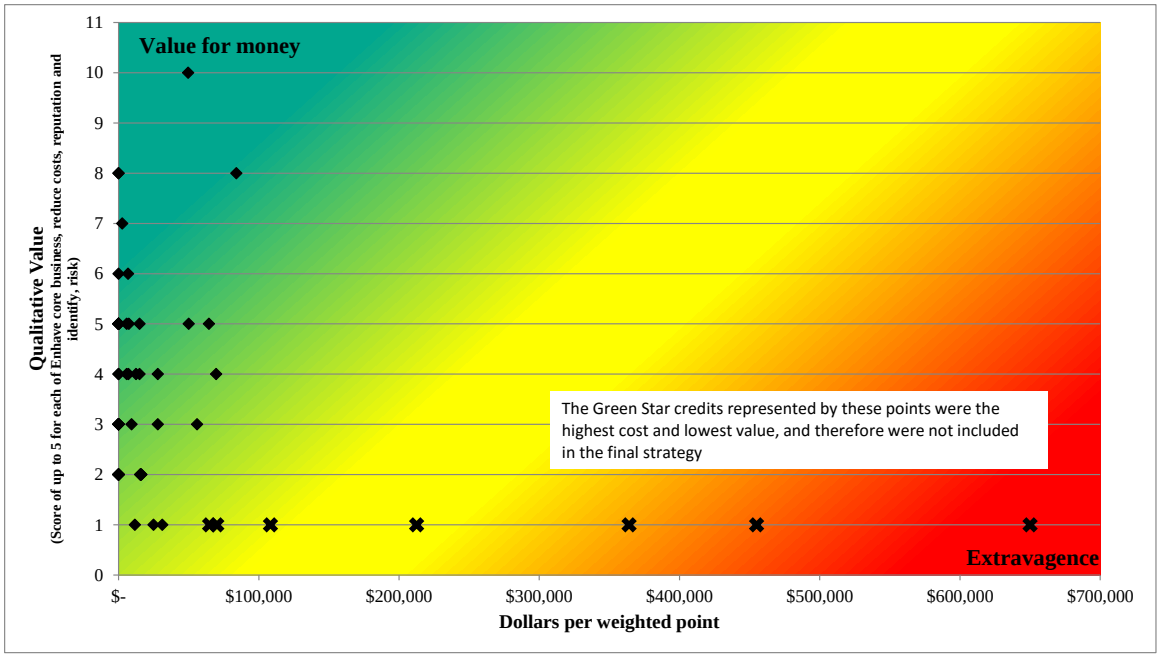


Figure 4 – Dollars vs value map for Green Star credits

CRITICAL REFLECTION

The final key steps in an action research cycle is to observe and critically reflect (Koshy, Koshy, & Waterman, 2011). As noted at the start, the two fundamental questions are whether the approach used is better than typical approaches and whether it is applicable on other future project.

Table 3 responds to these questions.

Table 3 – Assessment of Arts West Green Star approach compared to typical approaches

Issue and assessment		Explanation and evidence	Potential for other projects
Fostering stakeholder support by connecting ESD strategy to value in a transparent way	✓	Key project stakeholders participated in the process and ultimately supported the resulting ESD strategy as evidenced by sign-off of the strategy by the University's project manager, faculty representative and sustainability manager; conflict-free implementation of the strategy by the design team, and positive feedback from the architect and external project manager comparing their experiences of Green Star on this project compared to other projects that they have worked on. The approach did not engage as effectively as it could have with some University stakeholders who hold strong environmental values. For example, the approach doesn't explicitly distinguish between environmental outcomes beyond the weightings that have been applied within Green Star. It allowed transparent discussion between university stakeholders regarding which credits should be targeted and why. This was particularly useful in relation to materials credits, where some University stakeholders felt that it was part of the University's responsibility to influence the environmental performance of supply chains, whereas others didn't.	The approach has potential, particularly for owner-occupier buildings, and is already being used on other projects. In a speculative office or apartment building, the end users are often not known, so the estimation of value has to be informed by generic studies and experience of sales and leasing agents. Users of the approach need to be mindful of not losing support or confidence of the more environmentally passionate stakeholders.
Resulted in a different outcome than a least-(capital) cost approach	✓	Figure 2 shows that simply dropping the credits with the highest cost per weighted point would potentially result in a lower value outcome for the University. This is because high value credits such as Man-3 Building Tuning and Ene-2 Energy Sub-metering would be dropped.	Some clients just want the cheapest outcome to meet an externally imposed requirement (e.g. from town planning) and may not buy in to the approach,
Cost of ESD	✓ or **?**	The functional brief and design team views on standard practice affects what is counted as an extra ESD cost. For this project, the extensive shading system was driven primarily by the architectural intent rather than ESD outcomes, meaning that it wasn't costed as 'extra'. If the cost of the shading was allocated to the ESD, then the overall ESD cost would have been almost 50% greater that the ESD budget.	Project teams need to be mindful when defining what is a base requirement for the project (e.g. functional requirement, University standard, or industry standard practice) and what is an ESD 'extra'.
Time and effort required by key stakeholders	✓	Arup initially estimated the value of each credit in isolation from the University and project team. To be successful, the Green Star strategy needs to support of the University and the project team, meaning that all stakeholders need to	The approach requires time and support from relevant consultants and client representatives so

Issue and assessment		Explanation and evidence	Potential for other projects
		generally agree on the relative value of each Green Star credit. The costing approach did not seem to place a burden on either Slattery or LCI.	should be programmed in to the project as a distinct activity.
Resilience to 'value management' processes	**?**	The approach was somewhat untested in a whole-project 'value management' process because the ESD initiatives came back below the initial allowance. There was a question in the minds of some University stakeholders that rather than release money from the ESD allowance to the rest of the project, that this money should have been spent on additional ESD initiatives i.e. getting more ESD value than the briefed requirement for the allocation, rather than viewing the brief requirement as all that was required.	This style of approach should help during value management by highlighting non-environmental value to stakeholders. Whether it is successful or not will depend on how well stakeholders compare different types of value.
Resilience to contractor changes	**?**	The resilience to contractor changes was untested. The contractor, Kane, was engaged at 90% design and accepted the tendered Green Star strategy without changes.	To be explored on future projects.

CONCLUSIONS

Green Star is an environmental rating framework used by many Universities to guide the design of their facilities. Historically, the outcomes on Green Star rated projects have not always lived up to the expectations. Through action learning, we can improve the way that Green Star is implemented. The approach used in the Arts West Redevelopment shows promise for use on some types of other projects. Opportunities to learn further will be explored on future projects, particularly to understand whether the approach gives the Green Star strategy resilience during value management and D&C procurement processes.

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Architect	ARM + Architectus
Cost Consultant	Slattery
Building Services	LCI
Structures and Civil	Irwin Consult
Facades	Inhabit Group
ESD Consultant	Arup
Audio Visual	Umow Lai
Acoustics and Fire Engineering	AECOM
Building Surveyor	McKenzie Group

BIOGRAPHICAL NOTES

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REFERENCES

GBCA. (2007a). Stakeholder Feedback Report 2005/6. Retrieved from http://www.gbca.org.au/docs/Stakeholder_Feedback_Report_2005-6_Green_Star_-_Office_Design_and_As_Built.pdf

GBCA. (2008). Outcomes of public review of the new generation of Green Star - Office. Retrieved from www.gbca.org.au/uploads/16/1552/Outcomes_of_Public_Review_of_the_New_Generation_of_Green_Star_-_Office_Report_10March08_rebrand.pdf

GBCA. (2011). The revolution is building. Retrieved from www.gbca.org.au/docs/Green_Star_Revolution.pdf?x=1

GBCA. (2013a). Achieving the Green Dream - Greenhouse Gas Performance in Green Star certified office buildings. Retrieved from www.gbca.org.au/uploads/common/Achieving%20the%20Green%20Dream_Predicted%20vs%20Actual.pdf

GBCA. (2013b). A decade of green building. Retrieved from www.gbca.org.au/uploads/170/34474/A_decade_of_green_building_.pdf

GBCA. (2013c). Green Star Review 2012-13. Retrieved from www.gbca.org.au/uploads/16/1552/Review_Reports_2013.pdf

GBCA. (2013d). Green Star Review 2012-13 - Summary. Retrieved from www.gbca.org.au/uploads/16/1552/Green_Star_Review_Summary.pdf

GBCA. (2013e). Introducing Green Star. Retrieved from www.gbca.org.au/uploads/212/34772/Introducing_Green_Star.pdf

GBCA. (2014). The Value of Green Star: A Decade of Environmental Benefits. Retrieved from www.gbca.org.au/uploads/194/34754/The_Value_of_Green_Star_A_Decade_of_Environmental_Benefits.pdf

GBCA. (2015, July 19). Project Directory. Retrieved from www.gbca.org.au/project-directory.asp

Healey, G. (2011). Intelligent buildings: Integrated systems and controls. Retrieved from www.issinstitute.org.au/wp-content/media/2011/03/ISS-FEL-REPORT-G-HEALEY-low-res.pdf

Healey, G. (2014). Winning hearts and minds: the role of emotion and logic in sustainable design decision making. Environment Design Guide, 1-16.

Healey, G. (2015). Winning Hearts and Minds: The role of Emotion and Logic in the Business Case for Sustainable Building Initiatives. Journal of Design, Business & Society, 77-94.

Koshy, E., Koshy, V., & Waterman, H. (2011). Action Research in Healthcare. London: SAGE Publications.

Monash University. (2013). Environmental Sustainability Stakeholder/Reference Committee Minutes of Meeting 1/2013. Retrieved from http://fsd.monash.edu.au/files/9-2013_130423_essrcminutes1_2013.doc

Monash University. (c2013). Embedding ESD into New Buildings. Retrieved from http://fsd.monash.edu.au/environmental-sustainability/campus-sustainability/embedding-esd-new-buildings

Owen, C. (2006). Reaching for the stars. Retrieved from http://architectureau.com/articles/practice-25/

Perinotto, T. (2014). Green Star review stirs passion and calls for transformation. Retrieved from www.thefifthestate.com.au/articles/green-star-review-stirs-passion-and-calls-for-transformation/62870

University of Melbourne. (2013). Sustainable Building Design. Retrieved from http://sustainablecampus.unimelb.edu.au/campus_sustainability/design.html

University of Tasmania. (2015). Sustainable Built Environment Designs Policy. Retrieved from www.utas.edu.au/__data/assets/pdf_file/0006/39048/Sustainable-Built-Environmental-Designs-Policy.pdf

van der Heijden, J. (2014). Green building revolution? Only in high-end new CBD offices. Retrieved from http://theconversation.com/green-building-revolution-only-in-high-end-new-cbd-offices-24535