

## Outcomes of Stakeholder Feedback on the Green Star – Shopping Centre Design PILOT

28th August 2008

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The Green Star – Shopping Centre PILOT rating tool was developed by the Green Building Council of Australia (GBCA), in conjunction with its Technical Working Group (TWG) to facilitate environmental assessment of retail centres. The tool development process includes a PILOT period which allows for public review and comment. The PILOT process also includes up to six buildings undergoing a Green Star assessment under the PILOT version of the tool.

The GBCA ensures that the public review period is transparent through a formal Stakeholder Feedback process; this can be viewed at [www.gbca.org.au](http://www.gbca.org.au). The process includes publishing this Stakeholder Feedback Report. This document provides a summary of all feedback on the tool that was received in writing from stakeholders and PILOT projects. For each item of feedback, the GBCA's response is detailed. As part of the process, any comments received after the public review period closed are considered for further improvement of future versions of the Green Star rating tool.

The feedback has been organised according to the Green Star categories. The feedback and the responses are provided on the following format:

*It was suggested that...* (1)

GBCA Response: Agreed, the...

The submitted feedback is provided in *italics*, followed by a number in brackets that identifies each submitter; this code is for the GBCA and submitter's own reference only. This is followed by the GBCA response to the feedback.

## Management

*It was suggested that this category needs to address the management of construction. For example by addressing the energy efficiency of the site shed, recycled materials used that are not part of the building etc. Credit could give a point for having undertaken energy modelling of the site shed, using recycled materials in construction etc. (6).*

GBCA Response: The GBCA agrees that management of construction is an important consideration. For this reason, the issue is addressed by credits Man-5 'Building Guides', and Man-6 'Environmental Management'.

### Man-1 'Green Star Accredited Professional'

No feedback received.

### Man-2 'Commissioning Clauses'

No feedback received.

### Man-3 'Building Tuning'

*It was suggested that this credit is not a "closed loop". The owner may have intentions to undertake building tuning post-completion, but for a range of reasons may fail to do so. A contractual agreement could be set whereby the owner should provide a commissioning report to GBCA after 12 months of operation. (This may require management time, however it will ensure that commitments are followed through and results are achieved as per design intent) (10).*

GBCA Response: The Green Star – Retail Centre v1 rating tool can be used to achieve either a 'Design' or an 'As Built' rating. A 'Design' rating is an assessment of design intent, while an 'As Built' rating is an assessment of the completed construction project and requires contractual evidence to demonstrate compliance.

### Man-4 'Independent Commissioning Agent'

*It was suggested that the requirements of this credit seem to assume that the contractor is not capable of these functions because they would not be able to claim this credit without engaging someone outside a main contractor organisation. These skills are very thin on the ground and this assumes that the commissioning contractors know more about the systems than the designers and D&C contractors (5).*

GBCA Response: This credit requires independent third party confirmation and therefore it is inappropriate for the commissioning agent to be from the design team.

### Man-5 'Building Guides'

*It was suggested that there are no guarantees that a Building Users' Guide is finalised and released. There should be a commitment to present the Users Guide upon the completion of the project (10).*

GBCA Response: This has been addressed by the Green Star – Office v3 rating tool update and will be incorporated into the Green Star – Retail Centre v1 rating tool. In order to obtain this credit, a full draft of a building user guide must be provided at the time of assessment.

### Man-6 'Environmental Management'

*It was suggested that whilst ISO 14001 criteria are used to challenge the industry towards better performance, under current industry conditions accreditation is not always straightforward to achieve, nor are the benefits of accreditation clear compared to the costs. There should be provision to accept other equivalent standards or internal policies that set similar requirements as per the ISO 14001 requirements (10).*

GBCA Response: For smaller organisations below 30 staff, simple tools other than ISO 14001 are acceptable where the results are available to customers and the public, and internally available to staff and other building occupants. An independent Auditors' report confirming evidence of its effective use must be provided to achieve the credit. Further details are provided within the Green Star – Retail Centre v1 Technical Manual.

### **Man-7 'Waste Management'**

No feedback received.

### **Man-8 'Waste and Recycling Management Plan'**

*It was suggested that given the large amounts of waste produced at a shopping centre, the points available should be increased (6).*

*It was stated that the introduction of this credit is greatly needed for the Shopping Centre Tool however the weighting of the credit appears too low for the ongoing impact this may have. It was therefore suggested to provide additional points for this credit (12).*

GBCA Response: The GBCA Technical Working Group agreed to increase the number of points available to 2 points. Additional criteria relating to physical infrastructure were deemed appropriate to include, providing value to the 2 points.

*It was suggested that setting waste reductions targets could be controversial with prospective tenants. It was recommended to set waste reductions targets as a guide only (17).*

GBCA Response: The Waste and Recycling Management Plan must address both the owner and the tenants, and either set explicit annual waste reduction targets or provide a plan to audit the operational waste stream for setting such targets.

### **Man-9 'Building Management Systems'**

*It was suggested that this issue is much more important in the efficient operation of the building relative to the other points on offer. Therefore the number of credits for this should be increased significantly (5).*

*It was suggested that a properly functioning BMS system should be worth more than 1 point. It was recommended to award 2 points for this item as a minimum. Perhaps 1 point for the BMS and an additional point for comprehensive specification of aspects that assist other Green Star points such as feedback from energy management componentry, alarm schedules and initial trending / report related to building tuning and management in relation to Green Star objectives (13 and 14).*

*It was suggested that the introduction of this credit is greatly needed in all Green Star tools as the monitoring of energy use and setting targets has a large effect on energy usage and allows operational or commissioning problems to be identified and solved. This initiative is likely to have one of the greatest impacts on energy use and does not appear to be weighted heavily enough. It was recommended that additionally the weighting of this credit should be high as there is no retrospective energy rating tool for shopping centres (i.e. office buildings have ABGR) so there is no requirement to achieve the energy consumption detailed in Ene-1.*

*It was recommended to provide one credit for the use of a BMS, and two or more additional credits for the monitoring with the requirement that the equipment has the required sampling time (e.g. report every 15mins) to allow operational or commissioning problems to be determined (e.g. both chiller and boiler running, night purge system not working etc.). Also the monitoring and benchmarking of water and gas usage could be included. Some of these credits could be included within the Energy and Water categories. (12)*

*It was suggested that as it is only stated that the BMS is to be used for monitoring, a comprehensive monitoring and verification system could do the same job. Aim of this credit appears to be to use BMS for control, but the credit criteria only awards points for monitoring. A monitoring and verification system is able to monitor the required elements at a cheaper cost and could be accepted as a suitable alternative. The difference is that the BMS can control the operation of the Lighting, HVAC etc, which is not stated as a requirement. Otherwise, credit criteria could be changed to reflect intent/need for exercise of control (10).*

*It was suggested that BMS is required for credit, but the BMS functionality is not defined (unless this is assumed to be as per the Office design tech manual). Coverage of the BMS and the minimum functional requirements would make this a useful element (10).*

GBCA Response: The GBCA Technical Working Group agreed to retain this credit, with the same point value, with additional criteria included to require the building management system (BMS) to actively control systems, not solely monitor them. A list of systems has been provided within the Green Star – Retail Centre v1 Technical Manual.

## Indoor Environment Quality

*It was suggested that there should be credits in all Green Star tools for the reduction of UV light into the space? Many glass types significantly reduce UV light (12).*

**GBCA Response:** Green Star aims to drive the adoption of practices which are above and beyond those standard to a given industry. As noted, most high performance commercial window glazing already filters out ultraviolet radiation. Although this clearly provides an indoor environment quality benefit, the provision of this type of glazing is common industry practice, rather than exemplar practice, and as such is not addressed by this rating tool.

### IEQ-1 'Ventilation Rates'

*It was stated that AS1668 densities are out of date. The high densities in AS1668 mean those systems may be over-designed, leading to greater fan energy use than is required. If designs are done to expected occupancy then this credit will never be achieved.*

*As a result it was suggested that the credits needs a better benchmark (6).*

**GBCA Response:** The Technical Manual for the Green Star – Retail Centre v1 rating tool specifies that design occupancy, not default occupancy from relevant standards, must be used for points that address the mechanical ventilation system(s). The credit criteria must be met for 98% of operating hours.

*It was suggested that there is significantly more load diversity in a retail centre when compared to an office, with the resultant proposal to split common areas from tenancies. For example give 1 point for achieving a credit in common areas and another for achieving in tenancies.*

*Maybe include a credit somewhere for the natural ventilation of common areas (6).*

**GBCA Response:** This credit does not address the ventilation rates within tenancies. Natural Ventilation is already addressed in multiple instances within Green Star. For instance, this credit awards points if the building is naturally ventilated to the requirements of the Green Star – Retail Centre v1 Technical Manual. Furthermore, the use of natural ventilation in a shopping centre for energy efficiency purposes has been taken into account in the Energy Calculator when awarding points. The GBCA believes that there is no compelling reason to further award separate points for natural ventilation.

*It was suggested that the advantages of exceeding the standards to the extent required needs further investigation. Also, increase in outside air is assumed to promote a healthier environment - in built up areas experience shows that outside air will increase indoor pollutants, hence negatively impacting the quality of indoor air.*

*Improvement is good, however the impact on energy usage (for mechanical and mixed mode) needs to be assessed. Further studies need to be done into whether the benefits of the extra ventilation requirements justify the required improvements and costs. Natural ventilation may be more effective in regional centres than in more built up centres, so maybe location needs to be a variable in considering the credits granted for natural ventilation (10).*

**GBCA Response:** The comment regarding benefits of increased ventilation rates is noted, and the submitted feedback will be considered in the ongoing review of the credits for future versions of the Green Star suite of tools.

Green Star credits are established on the basis of environmental impact. GBCA acknowledges that some Green Star credits can be more challenging in an urban setting, whilst others can be more challenging in a rural setting.

*It was suggested that it is arbitrary to award points for increasing the outside air in an air conditioned building over and above the AS1668.2 1991 provisions. What is the logic behind this move to increase the running costs of the air conditioning? The latest version of the code AS1668.2 2002 has lower permissible outside air rates. Isn't this in conflict with IEQ-3?*

*This significantly increases the energy consumption of the air conditioning systems for no perceptible gain. The current outside air rate of 7.5l/s/p with quality filters is much higher than it has been for the last 25 years where the rate has varied from 5l/s/p to 3.5 l/s/p to 7.5l/s/p. It was*

*suggested that there has been a trend in the last couple of years to use CO<sub>2</sub> sensing of the return air to reduce the code minimum amount of outside air (e.g. the current Big W Brief) to minimise running costs. Our experience has been when this has been done properly there has not been any loss of indoor air quality (5).*

*It was suggested that the additional investment and additional energy required to achieve full points in a climatic environment like Queensland does not appear to be an environmentally sound decision. Rather than achieving the requirements 100% of the time a graduation of 80%, 90% 95% appears to be more sensible and economical viable.*

*Rather than achieving the requirements 100% of the time a graduation of 80%, 90% 95% appears to be more sensible and economical viable (17).*

GBCA Response: This credit sits within the IEQ category and is a health and wellbeing issue, whereas energy is addressed within the energy category.

*It was suggested that the approach to IEQ-1 and 3 needs re-consideration for shopping centres. These credits are the same as the office tool, however shopping centres require special consideration:*

- *Increased outdoor air improves productivity - in an office environment the comparative environmental benefit of this item is much greater than shopping centres.*
- *The variability of occupancy for a shopping centre is far greater, increasing the imperative for demand driven outdoor air control to manage energy and still create the preferred level of internal air quality.*

*Combine IEQ credits IEQ-1 and 3 into a single credit that awards 2 points for demand controlled ventilation (i.e. CO<sub>2</sub> sensing) AND, given that, points for increased outdoor air above the code requirement (1 or 2 points for 50% or 100% increases) for 95% of operating hours.*

*The percentage of operating hours is important because plant sizing is calculated on the worst case co-incident occurrence of occupancy / outdoor air volume and outdoor air temperatures. In Australia the occupancy and maximum temperatures are co-incident peaks during Christmas and New Year, but this is only a short amount of operating time; we believe it reasonable during these peak times for outdoor air volumes to revert to code required levels. For Green Star to require the outdoor air increase for 100% of operating hours would encourage plant size increases with a negative impact on cost and plant efficiency (13 & 14).*

GBCA Response: The TWG agreed to keep IEQ-1 and IEQ-3 as separate credits.

In version 1 of the Green Star – Retail Centre rating tool, the credit criteria has been amended to be required to be met for 98% of operating hours.

### **IEQ-2 'Air Change Effectiveness'**

*The intention may be laudable but the application of a theoretical method that measures the result after the building is constructed is inappropriate. Why use the 1997 version?*

*I have not seen this referred to in any consultant specification ever. The result is dependent on site measurements which are notoriously unreliable. Has anybody ever used this process in Australia/ and has it resulted in any benefit to the occupants? This credit needs a complete reappraisal. What is the objective? How is it really different to IEQ-1? Another measure should be used if air circulation is the objective (5).*

GBCA Response: The difference between IEQ-2 and IEQ-1 is that IEQ-2 relates to the effectiveness of air change whereas IEQ-1 is concerned with air change rates.

The standard referred to in the credit has been used in the previous versions of the existing Green Star rating tools. More than 70 projects have been certified to date; no feedback about this standard being inappropriate has been received.

The credit is included in the IEQ category throughout the suite of Green Star rating tools; the submitted feedback will be considered in the ongoing review of the credits for future versions of the Green Star suite of tools.

*It was suggested that this is very dependant on diffuser layout and type which can not be controlled by the developer within the tenancies. It was therefore proposed to separate common areas from tenancies for credit allocation (6).*

*The credit appears to be weighted too heavily, given the association only with the common areas.*

*Decrease credits or provide separate credits for base building and tenancies (will be difficult to demonstrate compliance for tenancies unless naturally ventilated) (12).*

GBCA Response: Tenancies are not addressed within the scope of the Green Star – Retail Centre v1 rating tool therefore they are excluded from the requirements of this credit.

*It was stated that this is potentially a difficult assessment because of the wide range of assumptions that need to be made and the absence of a clear methodology for constructing the CFD model. It was suggested that it would be very useful to put together a guidance note on the methodology for doing the CFD assessments - probably including such items as geometric detail, mesh construction, representation of diffusers, turbulence and thermal modelling, and convergence criteria. This would also help to ensure some level of consistency of result for an analysis method that has potentially high levels of uncertainty, and to make the most of what is potentially an expensive exercise (13 and 14).*

GBCA Response: Noted - the submitted feedback will be considered in the ongoing review of the credits for future versions of the Green Star suite of tools.

### **IEQ-3 'CO<sub>2</sub> Monitoring and Control'**

*It was asked whether the aim of this credit is to not only increase outside air based on CO<sub>2</sub> levels but also to minimise outside air when appropriate, to minimise energy (6).*

GBCA Response: The aim of this particular credit is to ensure the delivery of minimum outside air requirements. The minimisation of energy is not a concern of this particular credit, but is taken into account in the energy category of this rating tool.

*It was suggested that this credit is in conflict with IEQ-1 (5).*

GBCA Response: This credit is not in conflict with IEQ-1, but rather a complement. CO<sub>2</sub> sensors will help ensure the optimum delivery of outside air ventilation in accordance with the actual occupancy of the retail centre. By properly sizing the system as per IEQ-1 and ensuring the optimum delivery of air with the help of the CO<sub>2</sub> sensors, an ideal indoor environment can be created.

*It was suggested that the credit should be associated with all base building systems (including tenancies) as the staff and occupants' IEQ should be addressed. This credit should also be more greatly weighted as the CO<sub>2</sub> sensors are more suited to variable occupancy environments where the design occupation may be exceeded. This is a typical trait of retail centres (e.g. occupancy may exceed design during Christmas periods), therefore this credit is assumed to have a greater effect on IEQ than IEQ-1 or IEQ-2.*

*Increase credits available. Possibly provide one credit for common areas and one for tenancies (12).*

GBCA Response: Tenancies are not addressed within the scope of the Green Star – Retail Centre v1 rating tool, therefore they are excluded from the requirements of this credit.

### **IEQ-4 'Daylight'**

*It was suggested that encouraging daylight without glare control may cause some glare issues for occupants. It was suggested that maybe the glare control credit needs to be re-introduced. (6).*

*It was suggested that glare & heat load need to have recognition for automatic shading devices that will reduce glare / heat load (1).*

GBCA Response: Tenancies are not addressed within the scope of the Green Star – Retail Centre v1 rating tool, this credit considers common and mall areas. Due to the fact that the building occupants in these areas are transient, glare was not considered to be a significant enough issue to be assessed under this tool. Good design should result in shading devices to avoid over-heating, which would be rewarded under Ene-1.

*It was asked whether this is an energy or IEQ issue, i.e. does daylight improve the health of those in the mall, or is its benefit in a shopping mall the reduced lighting energy which may result? It was suggested that if this is deemed to be more of an energy issue, then daylight sensors should be required to achieve the credit (6).*

GBCA Response: This is a health and wellbeing issue, energy use is considered within the Energy Category.

*It was suggested that the credit should be increased to all base building areas including tenancies, malls and car parks. Providing tenancies with day lighting is a way that the building owner/developer can influence the tenancy layout. Car parks with day lighting provided also improves the quality of the space and may reduce energy. However it is debatable whether the car park comes under the IEQ category (i.e. Indoor), and whether people are in the car park long enough to warrant a credit. It was suggested to provide credits for mall, tenancies and car parks - either as separate or combined credits (12).*

GBCA Response: Tenancies are not addressed within the scope of the Green Star – Retail Centre v1 rating tool, therefore they are excluded from the requirements of this credit. As the focus is on the retail centre design, not on the tenancies, the Green Star – Retail Centre v1 rating tool only assesses daylight provided to the common areas (excluding car parks).

#### **IEQ-5 'Thermal Comfort'**

*It was suggested that the credit states standard clothing levels - what are these? If same as Green Star – Office Design then they may not be appropriate for external common areas of a shopping centre (6).*

GBCA Response: Open air mall areas of retail centres are not addressed by this credit.

*It was suggested that PMV is relevant in office spaces and not applicable in mixed mode or transient spaces. Need to use other assessment criteria, i.e. OUTSET (Outside Standard Effective Temperature) or other (6).*

GBCA Response: Noted, the submitted feedback will be considered in the ongoing review of the credits for future versions of the Green Star suite of tools. However, please note that open air mall areas of retail centres are not addressed by this credit.

*It was suggested that for PMV the credit needs to take into account design supply air velocities rather than a fixed value, as they contribute to complaints (1).*

GBCA Response: PMV should be calculated in line with the standards referred to in the credit criteria. Utilising a standard methodology for all projects allows fair comparison between those projects.

*It was asked how would assessments of thermal comfort be used to "evaluate appropriate servicing options." It was suggested that these words should be deleted (5).*

GBCA Response: Please note that this sentence does not appear in the Green Star – Retail Centre v1 rating tool.

*It was suggested that the thermal comfort credit should be extended to the tenancies as these are included in the ENE-1 calculation and generally will contribute to the IEQ provided for the staff and visitors. Extend credit to include tenancies (12).*

GBCA Response: Tenancies are not addressed within the scope of the Green Star – Retail Centre v1 rating tool.

#### **IEQ-6 'Hazardous Materials'**

*It was asked why a point is not available for new buildings with no asbestos if we are to measure the final resultant building? (5).*

GBCA Response: The aim of the credit is to encourage actions to reduce health risks from the presence of hazardous materials. New buildings should not contain any asbestos due to regulation. Please note that from the PILOT to version 1 of the tool, the asbestos credit has been expanded to address other hazardous materials. For further details see the GBCA website. An n/a is available for new projects that can demonstrate that they do not contain asbestos, lead or polychlorinated biphenyls (PCBs), this means that the available points will not be counted in a new building's final score, thus making sure that it is not disadvantaged in any way.

#### **IEQ-7 'Internal Noise Levels'**

*It was suggested that compliance requirements for a noise report by acoustic consultant, and implementation of their recommendations has the potential to lead to over specifications of materials use (for sound attenuation) and also sound baffles to reduce ventilation system noise,*

*which is likely to increase energy for ventilation. Industry experience suggest that acoustic consultant err on the side of caution by over specifying, where noise may not be an issue. It was suggested that an alternative compliance method should be established, for design and construction contracts, where the Mechanical designer is under a contractual obligation to comply with the detailed Design Brief and General Specification.*

*The alternative could be to specify a performance outcome that is enforced by a contractual requirement for the Mechanical Contractor to comply with AS/NZS 2107:2000, including General Specifications that require testing to determine compliance with AS/NZS 2107:2000. The required noise reduction levels provided in Table 1 of AS/NZS 2107:2000 should then be satisfied by the Mechanical Contractor, who through their expertise and extensive practical experience should be reasonably expected to achieve the required noise performance levels. Where the Mechanical Contractor fails during testing, the contract will require rectification work to comply (13).*

**GBCA Response:** This category considers the health and wellbeing of the occupants, whereas the Energy and Materials categories address the energy consumption and material usage of the building.

With regards to alternate compliance, this is noted and the submitted feedback will be considered in the ongoing review of the credits for future versions of the Green Star suite of tools.

*It was suggested that it should be clarified that the building services noise is equal or less than the maximum recommended design sound levels provided by AS/NZS 2107. Additionally, it would be desirable to include the requirement that only 95% of the floor area needs to achieve compliance with the criteria, as it might not be appropriate for a large suburban shopping centre to fail the criterion based on a measurement at a single location (19).*

**GBCA Response:** Your feedback is noted, however our experience suggests that equal or less than is implied by the term 'maximum'.

With regards to the 95% requirement, this is noted and the submitted feedback will be considered in the ongoing review of the credits for future versions of the Green Star suite of tools.

#### **IEQ-8 'Volatile Organic Compounds'**

*It was suggested that considering that the tool applies only to the base building, and it is only recommended that the tenants follow the guidelines, tenants may choose not to use more expensive environmentally friendly products. Good work put into minimising VOCs of the centre may be undermined by this. There is arbitrariness to the level of the existing guidelines, and it is unclear why the (relatively high) 95% level and not 80%, for example, has been chosen. Further research is required to improve clarity around the appropriate guidelines, considering effort vs. payoff at different VOC levels, and the possibility of diminishing returns beyond a certain level (10).*

**GBCA Response:** Tenancies are not addressed within the scope of the Green Star – Retail Centre v1 rating tool, therefore they are excluded from the requirements of this credit.

With regards to the percentages, this is noted and the submitted feedback will be considered in the ongoing review of the credits for future versions of the Green Star suite of tools.

*It was suggested that certification process for surface finishes includes a number of environmental impacts, including VOC emissions. Thus certified products have very low VOC emissions as well as other good environmental characteristics.*

*Finishes that have the "Environmental Choice Label" by Good Environmental Choice Australia should be included as a part of the percentage of low VOC finishes (9).*

**GBCA Response:** This is pending the establishment of new criteria for independent certification bodies and their standards. The GBCA may consider extending recognition of 3rd party certified products into other rating tools in the future.

#### **IEQ-9 'Formaldehyde Minimisation'**

*It was suggested that all products that use wood are certified to a standard that includes formaldehyde emissions. Thus certified products have very low formaldehyde emissions as well as other good environmental characteristics.*

*Recommendation: Wood products that have the "Environmental Choice Label" by Good Environmental Choice Australia will be considered a low emission product (9).*



GBCA Response: This is pending the establishment of new criteria for independent certification bodies and their standards. The GBCA may consider extending recognition of 3rd party certified products into other rating tools in the future.

#### **IEQ-10 'Mould Prevention'**

*It was suggested that 80% relative humidity (RH) figure in the supply duct is arbitrary. When air is conditioned / cooled and it reaches the dew point temperature (100% RH) condensation of moisture in the air occurs. The air then may be heated a little by the action of the supply fan in draw through systems but usually it is still above 90% RH when it is delivered to the supply duct. This process is one of the most important functions of the air conditioning system - to control humidity and to provide a "crisp" feel to the air conditioned space.*

*Delete the words "and no more than 80% relative humidity in the supply ductwork" (5).*

GBCA Response: It has been well documented that in order to prevent mould inside an air conditioning system, there should be a limit on the relative humidity of the supply ductwork. See ASHRAE standards for more information.

## Energy

### General

*It was asked whether there should be credits associated with the lighting of car parks. The lighting of car parks would appear to have as greater effect as ventilation if not greater.*

*Car park lighting credits could include use of occupancy sensors, daylight sensors etc. (12).*

GBCA Response: It was established during the TWG that the ventilation fans in car parks were of greater concern than car park lighting, this led to the creation of the credit Ene-6 'Car Park Ventilation'.

*It was asked whether there should be credits associated with installation of occupancy sensors in BOH areas such as corridors, loading docks etc. (12).*

GBCA Response: This is already addressed in the Green Star – Retail Centre v1 Energy Calculator. Occupancy sensors in back of house spaces should be addressed as is outlined in the modelling protocol: "Lighting must follow the appropriate lighting profile whenever the appropriate occupancy profile is greater than 0." The same would be true of equipment and HVAC systems.

*It was suggested that ratings are based only on design commitments with no requirements to produce implementation evidence at any stage. One possibility would be to have the design tool rating only available after the centre has been constructed and opened i.e. after the shopping centre is occupied. The owner of the centre could also be required to perform an ABGR retail assessment. And considering ABGR is well known in the market as a performance measuring tool, the uptake of it will be welcomed (8).*

GBCA Response: The Green Star – Retail Centre v1 rating tool can be used to achieve either a 'Design' or an 'As Built' rating. A 'Design' rating is an assessment of design intent, while an 'As Built' rating is an assessment of the completed construction project and requires contractual evidence to demonstrate compliance.

*It was suggested that co-generation minimizes the CO<sub>2</sub> emissions in comparison to the traditional form of electricity generation and reduces peak demand on the electricity grid. The tool needs to take into consideration this fact, and compensate for the savings made from co-generation vs. traditional electricity supply (8).*

GBCA Response: Cogeneration is directly rewarded in Ene-1 'Energy Improvement' and has the potential to be rewarded in Ene-4 'Peak Energy Demand Reduction'.

### Ene-1 'Predicted Greenhouse Gas Emissions'

The table below outlines the issues raised in the submissions during the Public Review Period, and the GBCA response that explains the reasons for the position taken, and outlines any corrective action.

Feedback	GBCA Response
<i>A minimum level of energy performance should be set as a conditional requirement similar to the Office tools. (6)</i>	The GBCA has carefully considered the inclusion of an Energy Conditional Requirement, and it was not seen as a critical element within this version of the rating tool. Its inclusion may be considered for future versions, based on environmental impacts and industry practice.
<i>Energy Benchmarks – They do not change with postcode or state. As a result it has not been possible to comment on regional differences in the benchmarking. (6)</i>	The Green Star Energy Calculator does not provide adjustments in benchmarks for Greenhouse gas emissions for different regions or states. The aim of the Energy category in the Green Star tools is to reduce



	<p>the total Greenhouse gas emissions from buildings, regardless of their location.</p> <p>The Green Star Energy Calculator uses greenhouse gas emission coefficients from the Australian Greenhouse Office (AGO). These coefficients for electricity and gas vary between states; the greenhouse gas benchmarks are however the same throughout the states.</p> <p>The electricity benchmark was calculated by finding the weighted average of the emissions for consumption of electricity generation. The weightings came from the percentage of contributions to national emissions.</p> <p>The gas benchmark was calculated using the natural gas combustion emission factors for small users. Small users were chosen to set the benchmark as most buildings will be classified as small gas users (&lt;100,000GJ per annum). The weighted average was found using percentage of contributions to national emissions.</p> <p>Because of the variations in the states' greenhouse gas coefficients, projects in some states will have to perform better, and engage in more climate-sensitive design, in order to achieve the Conditional Requirement and points within the Ene-1 credit.</p>
<p><i>BESTEST - you cannot "certify" against BESTEST. The ASHRAE Standard / BESTEST confirms that the software provider has gone through a level of quality assurance and comparison to other simulated data to satisfy themselves that their software is behaving in line with other accepted simulation data. Testing the software in line with BESTEST is not certifying the software. Ask the majority of software providers and we would expect them to confirm this. (6)</i></p>	<p>The text has been reworded in the Energy Calculator Guide.</p>
<p><i>Infiltration - assumptions are relevant to offices, but possibly not retail. The infiltration or handling of uncontrolled outdoor air through building entries is critical to get representative AC energy use for public mall areas. (6)</i></p>	<p>Infiltration rates in the Simulation Methodology for projects are not specified. This allows the project team to adjust infiltration rates based on their centre design. The infiltration rates used in the benchmark model were based on the national shopping centre survey carried out for the development of this tool and the expertise and recommendations of the TWG. The infiltration rates for Back of House</p>



	<p>unoccupied areas will be reviewed for the next revision of the Energy Calculator Guide.</p>
<p><i>Light &amp; Power Loads – 60W/m<sup>2</sup> is on the higher end of common practice. In reality there is diversity across tenants. We believe there are merits in considering load diversity between tenants to identify systems that respond weakly to this scenario and to show the strength of systems that respond well to diversity. A range on specialties of 20-80 W/m<sup>2</sup> is not uncommon. Furthermore majors, discount department stores, mini-majors and bulky goods should be assessed at a much lower average density of say 20-25 W/m<sup>2</sup>. (6)</i></p>	<p>The figure of 60W/m<sup>2</sup> was determined based on information from a national shopping centre survey conducted by the GBCA. The opportunity to include diversified equipment loads was suggested to the TWG during the development of this tool, but was ultimately rejected to maintain simplicity.</p>
<p><i>Light &amp; Power profiles – Having no light &amp; power loads at night is unrealistic, at least 5-10% should be allowed for. (6)</i></p>	<p>Light and power loads at night were rejected during the development of the tool as being unrealistic, and not a significant enough energy use for a shopping centre. Exterior lighting in car parks is already addressed by the deemed to satisfy section of the BCA. The GBCA deems these requirements to be adequate for purposes of the tool.</p>
<ul style="list-style-type: none"> <li>• <i>Occupant Density – tenant are occupant densities are both high and do not show any diversity. 4m<sup>2</sup>/person is a rare occurrence and where it does occur it would be on a peak day in select areas for a limited time. Some centre owners design to a much lower density than this such as 6m<sup>2</sup>/person for both malls and tenants. In this case simulating such a design at densities that exceed the design points could prove problematic.</i></li> <li>• <i>Occupant Profiles – related to the above to have every day be occupied at 4m<sup>2</sup>/person through core trading hours would be every centre owner's dream. The profiles represent a peak day, average days may be 20-40% of this peak design value. If the profiles show no diversity then the benefits of demand controlled ventilation, VAV or plant with high part load efficiency would not be recognised. Profiles with daytime and day of week diversity are needed.</i></li> <li>• <i>Trading Hours – extended trading hours are the norm rather than the exception in most shopping centres. The current simulation protocol is for core trading only and would not recognise the benefits of strategies such as zoning lighting controls to reduce extended trading hours lighting, AC, or escalator energy use. There is also an issue of plant part load performance. The current protocol loads the system heavily and again does not test it at part loads or at non daytime ambient conditions. We recommend the provision be made</i></li> </ul>	<p>The GBCA received this and other comments requesting flexibility on occupant densities, profiles, and trading hours. While diversified profiles and equipment loads were considered by the TWG, these were rejected during the development of the tool to maintain simplicity of the modelling process. This action also prevents score optimisation by design teams through load assignment (using zone randomisers).</p>

<p>for extended trading hours. (6)</p> <ul style="list-style-type: none"> <li>• Car park Profiles – Having no car park lighting on outside core trading hours is unrealistic. (6)</li> <li>• Operational hours are not always 9am-5pm. (6)</li> </ul>	
<ul style="list-style-type: none"> <li>• AC Coverage / Boundaries – The guidelines allow space and tenant AC energy to be excluded where the base building supplies condenser water only. We believe that the energy coverage should be inclusive of all tenants, i.e. all GLA. To have a rating tool that only looks at those areas the owners pay the energy for will create confusion. A centre will be badged as green when there are no assurances that half the tenanted area (majors) has had any focus on sustainability and energy efficiency. We know of centres where only 30-40% of the air conditioned tenant area is supplied from centre operated plant. Inclusion of all areas will generate a healthy focus on the majors which is all consistent with the spirit of Green Star. Also if an area were excluded then all AC energy should be excluded. To include towers and pumps but not the water cooled units (compressor and fans) creates confusion. Do the benchmarks adjust for this scenario. As another example, what happens when the centre as an environmental initiative sells CHW to a major, do we exclude the area and include everything other than the air handlers? NB. These comments are also relevant to the water category. (6)</li> </ul>	<p>The scope of the Green Star – Retail Centre v1 rating tool is limited to a base building rating. Retail owners have almost no control over what systems tenants install, in a similar way to tenancies within office buildings. The Green Star – Retail Centre v1 Energy Calculator deals with this issue in the same manner that ABGR (now NABERS Energy) for offices, and other tools in the Green Star suite do.</p> <p>Four modelling options have been provided for different services strategies.</p> <p>For example, the energy consumption of the air conditioning system would be calculated assuming a low COP. This is because the base building could have installed an efficient system but chose not to. Please see the Green Star – Retail Centre v1 Energy Calculator Guide for further details.</p>
<ul style="list-style-type: none"> <li>• Plant COP – We are aware that a chiller COP of 5.5 is stated in the benchmarking methodology, but that this appears to be used as an average seasonal plant COP inclusive of pumps and towers. The stated average chiller COP is probably a reasonable benchmark for existing centre chiller performance. It is too optimistic if the intent is to include pumps and towers and as such would be making the benchmark too optimistic. Also a reasonable argument can be made to have this plant COP vary regionally and possibly by size of development. Cooler and drier climates will achieve higher efficiency while smaller developments will be in an air cooled equipment class. The counter-argument on smaller developments may be lower common light and power? (6)</li> </ul>	<p>See above. In addition the Green Star Rating tools do not take into account climate variation or regional differences for energy consumption, and as such does not see the need adjust the COP based on location. This information has been included within the Standard Benchmarking Document which will be released on the website with the official release of the Green Star – Retail Centre v1 rating tool.</p>
<ul style="list-style-type: none"> <li>• Ancillary Services – Ancillary suggests secondary which we believe is misleading. Car parks, common light &amp; power and vertical transport are far from ancillary in a shopping centre. Suggest an alternative term is used or that guidelines are written around AC, Common Light &amp; Power, Car parks and Vertical Transport. (6)</li> </ul>	<p>A number of submissions were made with regards to language, typos and errors in omission. The GBCA has amended and clarified the language in the Energy Calculator Guide where appropriate.</p>



<ul style="list-style-type: none"> <li>• <i>Energy Costs – suggest they are appropriately qualified as indicative, simulated etc and perhaps not to be relied on from an operational cost planning point of view. (6)</i></li> <li>• <i>Case Study - There appears to be some inconsistency in case study areas that don't appear to add up. (6)</i></li> <li>• <i>Mall Occupant Density – There are typos and missing values in the tables. Comments similar to tenant area occupant density on lack of diversity. (6)</i></li> <li>• <i>DHW Calcs – The first table in Appendix D suggests a 20:1 reduction in DHW water use if 4/5A fittings are used. Also this wording should be aligned with new WELS star ratings. (6)</i></li> <li>• <i>Profiles in the simulation methodology and the benchmarking methodology are different. E.g. tenancy lighting load is for 8 hours a day in the simulation methodology and for 10 hours in the benchmarking methodology. (6)</i></li> </ul> <p><i>We note that there have been some issues with the calculator and we believe that the version on the Green Star web site as at 11 December 2006 also requires attention. (13)</i></p>	
<ul style="list-style-type: none"> <li>• <i>Lift Energy Calculations – Calculation of lift energy use has always been an area of uncertainty in our industry. We recommend a few lift engineers be consulted on the method as we believe it is not representative of relative lift energy use. Otherwise establish a standard benchmark as in the Green Star ABGR protocol for Office Design. (6)</i></li> </ul>	<p>The value was determined by both the national shopping centre survey conducted by the GBCA and TWG experience. This calculation methodology will be reviewed for the next revision of the tool.</p>
<p><i>Control requirements for tenants should be benefited due to the large impact tenants have on the energy consumption of a retail centre. If this can't be included here may be appropriate to add a separate credit for tenant engagement. (6)</i></p>	<p>This is a base building tool and as such this issue falls outside of the scope of the tool. This will be reviewed in the next version of the Green Star – Retail Centre rating tool.</p>
<p><i>Escalators. Need to recognise energy savings related to escalators / travelators that slow down during off peak times. (1)</i></p>	<p>Where escalators and travelators are designed to shut down outside of occupancy hours, the occupancy profiles for the appropriate space type should be used. Whenever the occupancy is greater than zero, the escalators and travelators should be on.</p>
<ul style="list-style-type: none"> <li>• <i>Modelling to an energy benchmark presents some concerns. Further clarity is required on what the benchmarks based on, and whether they are achievable or too challenging. Need to provide better information on how the benchmarks have been calculated, and sources of these. Overall element is purposeful as it should</i></li> </ul>	<p>Additional language has been included in the Green Star – Retail Centre v1 rating tool Energy Calculator Guide. The Standard Practice Benchmark document will also be released with the release of version 1.</p>



<p><i>give incentive to the range of energy conservation measures. (10)</i></p> <ul style="list-style-type: none"> <li><i>• Require additional clarity on how the benchmark energy consumption numbers are derived. Provide Documentation to support this (11)</i></li> <li><i>• To add to this, the Green Star Energy Calculator uses benchmarks. These must be open and transparent, and the methodology used to get to these also needs to be transparent. Different size centres in different locations will potentially operate differently. It is unclear how the benchmarking methodology take into account the different shopping centre sizes, location, and the different operating parameters. (8)</i></li> </ul>	
<p><i>What is a conventional base building? Why not use the BCA Section J energy calculations and adjust them to set a higher standard? (5)</i></p> <ul style="list-style-type: none"> <li><i>• Now that we have section J of the BCA why wouldn't the PILOT refer to the energy calculation process outlined in the BCA with some modifications if they were deemed necessary? Maybe just changing the base level MJ/sq.m. listed in the BCA would be a way of raising the standard above the minimum level nominated in the BCA. This would be much simpler in practise and not duplicate design work. (5)</i></li> </ul>	<p>The scope of the Green Star - Retail Centre v1 Energy Calculator differs from the scope of the BCA energy calculations. Providing an alternative methodology is a strategic decision of the GBCA Board. This methodology will provide Green Star with control over modelling methodology which will enable it to effectively manage, revise, and provide better support to projects who will be undertaking a Green Star Rating.</p>
<p><i>Are 15 points available if 100% Green Power is purchased? (5)</i></p>	<p>Carbon Credits, off-sets and commitments to purchase renewable or 'green' power from an electricity supplier are an operational matter, rather than an inherent building attribute; as a result 'green' power cannot be recognised in energy modelling.</p>
<p><i>The required design lighting and power loads exceed the requirements of the BCA2006. Reduce the design lighting and power loads to that of the BCA2006. (12)</i></p>	<p>The lighting and power loads in the benchmark building were based on a national survey of shopping centres conducted by the GBCA, and the expertise and recommendation of the TWG.</p>
<p><i>Provision of credit for individual tenant controlled HVAC plant. This would allow HVAC systems to be turned off when not operational or when external doors are opened. A typical approach to providing HVAC to a strip of tenancies, one or two of which may operate out of shopping centre hours e.g. video shop, restaurant, bakery. Providing individual HVAC plant allows a lot of energy to be saved which is not realised within the energy model performed for ENE-1 Provide credit for individually controllable HVAC per tenancy. (12)</i></p>	<p>The Green Star – Retail Centre v1 rating tool only assesses base building design attributes, independent of tenant behaviour. Any energy use by tenants (such as light and power, and tenant installed air conditioning systems) is not considered within the Green Star – Retail Centre v1 rating tool.</p>
<p><i>The level of detail required for the energy</i></p>	<p>Currently the Green Star – Retail Centre v1</p>



<p><i>modelling submission is high and does not suit projects where discipline specific detail is passed on to design and construct contractors. The energy calculator guide and modelling protocol should concentrate on integrated design features such as orientation, glassing / shading concepts, overshadowing, etc. Whilst it is ideal to provide a high level of services details (such as chiller staging, actual efficiency curves of plant, index run pressure drops, etc.), the option should be available to show a Contractual performance based approach to energy performance at a specific Subcontract level provided this is backed by a BMS system and commitment to a site Energy Management Plan.</i></p> <p><i>Amend the energy modelling protocol to focus on integrated design up front and allow the option of a Contractual performance based approach to energy performance at a specific Sub-contract level provided this is backed by a BMS system and commitment to a site Energy Management Plan.</i></p> <p><i>(13)</i></p>	<p>rating tool is designed to assess the full scope and design of a project, for a Green Star – Retail Centre ‘Design’ rating, or the full finished building for a Green Star – Retail Centre ‘As Built’ rating. This ensures that the rating reflects the true base building attributes rather than a commitment to achieve such attributes.</p> <p>However, the GBCA understands that there are a number of projects built as Design and Construct (D&amp;C) projects, particularly in the Retail Centre sector. As such, guidelines for D&amp;C projects are currently being developed. These guidelines will carry over to the Energy Calculator Guide.</p>
<p><i>We note that there have been some issues with the calculator and we believe that the version on the Green Star web site as at 11 December 2006 also requires attention. Please note the following items (also included in the feedback form):</i></p> <ul style="list-style-type: none"> <li>▪ <i>The emissions co-efficient for electricity for all states is 1.04 kg CO<sub>2</sub>/kWh (determined by entering 1000 kWh into the energy calculator and selecting the various states). This is approximately the NEM-wide emissions intensity as determined by the National Electricity Market Management Company (NEMMCO) on a weekly basis (<a href="http://www.nemmco.com.au/settlements/910-0131.htm">www.nemmco.com.au/settlements/910-0131.htm</a>). NT and WA are not part of the NEM, so should have different intensities.</i></li> <li>▪ <i>The gas emissions co-efficient for all states except Tasmania are as given in the AGO 2005 emissions workbook (<a href="http://www.greenhouse.gov.au/workbook/index.html">www.greenhouse.gov.au/workbook/index.html</a>).</i></li> <li>▪ <i>The Tasmanian gas emissions factor comes from an unknown source and is about 4 times that of other states. Is this correct?</i></li> <li>▪ <i>If the electricity emissions co-efficient is taken from NEMMCO, then it is power station emissions only (according to Mr Wing Chan of NEMMCO). The gas coefficients on the other hand are fuel cycle (i.e. including emissions associated with fuel extraction according to the AGO 2005 emissions workbook). Was it intentional</i></li> <li>▪ <i>The "extras" table adds the energy consumption from gas incorrectly; it does not convert the input from MJ/yr to kWh/yr.</i></li> <li>▪ <i>The benchmark emissions do not change with</i></li> </ul>	<p>The Energy Calculator Guide includes a number of clarifications that address this submission:</p> <ul style="list-style-type: none"> <li>▪ The Greenhouse Gas co-efficients for gas and electricity for the tool have been updated to current AGO workbook figures instead of NEMMCO figures.</li> <li>▪ As the figures for GHG emissions in Tasmania are significantly lower than other Australian States, the figure for Tasmania has been adjusted to encourage energy efficient buildings (please refer to the Energy Calculator Guide for further details).</li> </ul>





<p><i>a change in State. This seems unrealistic given the climatic differences between say Queensland and Tasmania.</i></p> <ul style="list-style-type: none"> <li>▪ <i>Accordingly, as we believe there is doubt over the accuracy of the tool and we believe that 25% improved energy performance from statutory requirements should be worth several points on the energy calculator so have included for ongoing discussion and submission. (13)</i></li> </ul>	
<p><i>A performance based rating is also required to ensure design intent is delivered in actual performance. This factual and actual performance information is essential to increase green building credibility and engender confidence and accountability for actual building results and outcomes. An ABGR retail tool is in the process of being developed, and we would recommend that the GBCA team who have already worked on developing the retail energy tool work adopt the NSW Government ABGR for retail. This would lead to integration between the Green Star – Shopping Centre Retail tool and the ABGR tool. It is undesirable to release duplicate tools for measuring the same thing in competition with each other, which has the potential to confuse the sustainable buildings market, and delay much needed investments in green buildings. (8)</i></p>	<p>At the time of writing the ABGR (now NABERS Energy) tool for Retail has not been released, to expedite release of the Green Star - Retail Centre v1 rating tool, Ene-1 will proceed solely with the Green Star - Retail Centre v1 rating tool Energy Calculator. When NABERS Energy releases a retail tool, the GBCA will release guidelines for utilising the outputs from the tool within the current version of the Green Star – Retail Centre rating tool.</p>
<p><i>With the energy calculator we are assuming that, although we nominate area of the majors in the top section, energy consumption of the majors is not included in the energy section. Note that we are finding anomalies in the energy calculator (such as the way it sums energy consumption across different energy units, the energy intensity it appears to be using for the various states) - we will continue to work on this and summarise in the coming week. (7)</i></p>	<p>The energy consumption of the majors areas are to be excluded. The only reason the area is required is to determine the building "efficiency" ratio (tenancy to mall area) as well as the benchmarks for the other ancillary energy uses. For example, increased areas will require the base building operators to provide more lifts and escalators, etc.</p>

**Ene-2 'Electrical Sub-metering'**

*It was suggested that sub metering of loads > 100kVA gives incentive for metering systems. The element does not however provide advice on how the meters should be read or how long data should be stored for. It was stated that this credit links to Man 9 which awards points for a BMS that monitors (just like metering). Both these points should be awarded where the meters are read by a specialist metering system and not the BMS, and the BMS used to control the operation not just monitor (10).*

GBCA Response: Reading meters and storing data are operational issues which fall outside the current scope of Green Star rating tools.

*It was suggested that all tenancies have an authority meter and therefore will always get this credit. If this is an additional meter how does this relate to the authority meter? (6).*

*It was suggested that this is normal practice in all tenancies in shopping centres? Why include a point for this? (5)*

GBCA Response: The credits Ene-2 *Electrical sub-metering* and Ene-3 *Tenancy Sub-metering* have been combined into one credit and expanded to cover all substantive energy uses. A requirement for 'an effective mechanism for monitoring energy consumption data' has been included within the Credit Criteria.

*It was asked should there be a credit for individual gas metering as well (or any fuels for that matter e.g. diesel generators)? This is probably a greater issue in Shopping Centres as gas is reticulated to tenants and not just the base building making it more difficult to track where energy is used (12).*

GBCA Response: Any large energy source should be sub metered in line with the requirements of Ene-2, the wording for Ene-2 has been clarified in the Technical Manual reflecting the need for sub-metering of all substantive energy uses within the building.

### **Ene-3 'Peak Energy Demand Reduction'**

*It was suggested that it would be good to provide some recommendation such as the use of cogen-absorption chillers, light controls to manage intensity of lights and occupancy controls (10).*

GBCA Response: Additional advice has been provided in the Technical Manual that shows which strategies can be used to claim points for this credit, both for active and passive systems.

*Reducing peak demand has a large impact and it is believed the associated credits are too low for the perceived impact*

*Increase credits available (12).*

GBCA Response: The TWG discussed the points available and agreed to keep the points value at two.

### **Ene-4 is not applicable to the Green Star – Retail Centre v1 rating tool.**

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### **Ene-5 is not applicable to the Green Star – Retail Centre v1 rating tool.**

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### **Ene-6 'Car Park Ventilation'**

*It was suggested that this is dependant on site restrictions and therefore may not encourage naturally ventilated car parks. We are not sure whether this will drive change or possibly promote urban sprawl.*

*Possibly need to include a credit in Land Use and Ecology which encourages land use efficiency. The criteria could involve a GFA to site ratio (6).*

GBCA Response: If an internal car park is 100% naturally ventilated it will achieve full points under this credit.

This credit lies within the Energy Category, issues concerning the site are addressed within the Land Use and Ecology category.

*It was asked what the difference between natural ventilation and passive systems is? It was stated that these days it is normal to include CO monitoring and variable speed drives - is one point available for enclosed systems? (5).*

*It was suggested that the credit needs to be clarified whether it is for internal car parks only or open deck car parks. The definition of internal car parks also needs to be carefully considered as many retail car parks probably sit somewhere in between (12).*

*It was stated that there is an assumption that the aim is to minimise the CO<sub>2</sub> emission. In this case, the option of 20% naturally ventilated and 80% passive supply / active exhaust is more favourable than 100% passive supply / active exhaust. Less energy used, therefore less CO<sub>2</sub> emission. The Credit Criteria has to be reworded to reflect the above example (17).*

GBCA Response: Clarifications have been made throughout the credit within the Green Star – Retail Centre v1 Technical Manual.

The point for 'car park mechanical ventilation fans including variable-speed drives controlled by carbon monoxide monitoring' is an additional point, dependant on the other points being achieved.



*Parking volumes are highly variable in shopping centres. During low volumes, parking is concentrated to the entry points and this is often internalised - therefore (apart from roof top parking) related to mechanically ventilated zones. The points available for CO monitoring and VSD fan control should be higher.*

*Adjust the points available for CO and VSD fan control to 2 points. Adjust the points for fully naturally ventilated car parks to 4 points (13).*

*It was suggested that one point should be available for the provision of VSD and contaminant monitoring and control where the car park is fully enclosed. This type of car park (i.e. no natural ventilation) is likely to have a high energy consumption and high environmental impact, therefore providing contaminant control and VSDs to this type of car park would significantly reduce this impact. The credit in the PILOT scheme is only awarded where partially naturally ventilated car park include contaminant control and VSDs. The environmental impact of fitting these type of car parks with contaminant control and VSD would be far less than fitting fully mechanically ventilated car park with these controls (12).*

GBCA Response: Car park mechanical ventilation fans including variable-speed drives controlled by carbon monoxide monitoring was considered to be common practice and is only recognised where points for passive systems have been achieved.

## Transport

### General

*It was suggested that this category should be more highly weighted. It was particularly noted that the weighting is reduced from Green Star Office Design. Strategies that encourage modal shift away from motor vehicles and that include strategies for trip reduction have greater ability to improve environmental outcomes related to shopping centres than, say IEQ (13).*

GBCA Response: Initiatives for efficient transportation are important in a retail centre development. Comparing the different types of environmental impacts that are targeted in the different Green Star categories is a complex task. The Green Star weightings are based on an industry survey and a benchmarking study of other environmental assessment methodologies for buildings. The submitted feedback will be considered in the ongoing review of the credits for future versions of the Green Star suite of tools.

*It was suggested that there should be a credit that rewarded extension of centres rather than the development of new sites. Extending existing centres may reduce transport as all shopping needs can be achieved through one trip (12).*

GBCA Response: Eligible building extensions can be rated under the Green Star – Retail Centre v1 rating tool.

### Tra-1 'Provision of Car Parking'

*It was suggested that there is a need to acknowledge Centres that provide community buses for shoppers (1).*

GBCA Response: The provision of a community bus/transport system can be included in the transport calculator. However the level of provision would need to be equivalent to the level of service provided by public transport for points to be achieved. Every project that chooses this method of transportation must submit a CIR prior to assessment.

*It was suggested that despite support for the concept in principle, in shopping centres it is commercially difficult to reduce the number of car parking spaces as a lack of available spaces is always a customer concern (10).*

GBCA Response: Noted.

### Tra-2 'Fuel Efficient Transport'

*It was suggested that there is a need to encourage fuel efficient and/or vehicles using renewable fuel technologies (1).*

GBCA Response: This will be addressed by the changes to Tra-2 in line with the Green Star – Office v3 rating tool; the credit is now titled 'Fuel-Efficient Transport'.

*It was suggested that small car parking spaces should be located near entrances in a preferred location similar to disabled parking, to further encourage the use of small cars (6).*

GBCA Response: Agreed, and amended; the Green Star – Office v3 rating tool included this change and this has been adopted for the Green Star – Retail Centre v1 rating tool.

*It was suggested that it is a concern that the percentage requirement for small car parking spaces is too high, shopping centres will not strive for this as it will exclude some of their customers.*

*It was suggested that smaller spaces in a shopping centre will have a greater impact on encouraging the purchase of small cars due to retail car spaces being more highly 'prized' than those of offices.*

*It was suggested that shopping centres try to minimise the car park sizes to maximise car spaces thereby achieving the first credit automatically (12).*

GBCA Response: TWG discussed these issues and agreed to remove the requirements for the first point and reduce the number of points available to one.

*It was suggested that potential customers could avoid the shopping centre due to a lack of suitable car parks e.g. Mother with 4WD (17).*

GBCA Response: Agreed. The aim of the credit is: To encourage and recognise developments that

facilitate the use of fuel efficient vehicles. It is hoped that customers would use available public transport as an alternative to their cars, rather than avoiding visiting the retail centre.

### **Tra-3 'Cyclist Facilities'**

*It was suggested that this is not very practical for a shopping centre - people are unlikely to want to cycle with shopping bags (1, 12).*

GBCA Response: One of the mission statements of Green Star is for it to be used for market transformation. While at the moment this may seem unreasonable for the Australian market, these types of facilities are common in Europe and other densely populated urban areas.

*It was suggested that this credit currently awards points where the shopping centre developer provides facilities to all building staff. This means they are providing facilities for staff that are not obligated to the shopping centre operator and this creates a large impost (e.g. legal, maintenance, privacy) in terms of construction and operations.*

*Ensure the minimum of 5% of the building's staff for one point is aligned to the % of centre management staff in the building. This will encourage developers to at least ensure adequate facilities for the centre management staff (13).*

GBCA Response: This is a whole building rating tool and as such the facilities are required for the whole building. It is at the discretion of the individual retail centre operator as to whether they wish to go for this point.

*It was suggested that safe access for bicycles to secure parking should be demonstrated to achieve credit (6).*

GBCA Response: Agreed, this has been addressed within Tra-5 'Trip Reduction – Mixed Use'.

*It was suggested that the total points awarded for cycling facilities are similar to Green Star - Office Design, however there are great differences in the environmental impact cyclist facilities will have. The change in the environmental impact is acknowledged in Green Star - Shopping Centre (by the separate treatment of staff and visitors). For shopping centres the greater environmental impact is visitor trip generation and transport modes and there should be a focus of point availability to those credits. Note that the modal options for visitors to switch to bicycles is also low due the need to carry goods home from the shopping centre. Maximum 2 credits for cyclist facilities, 2 credits for Trip Reduction - Mixed Use (13).*

GBCA Response: This is a whole building rating tool and as such the facilities are required for the whole building. These types of facilities are common and utilised in Europe and other densely populated urban areas. Although it can present some challenges, it is quite possible to transport goods on bicycles.

*It was suggested that the point available for visitor bicycle parking should be independent of the points for staff bicycle parking and facilities (13, 17).*

GBCA Response: The points available for the staff and the visitor bicycle parking have been separated in version 1 of the tool.

*It was suggested that including specific numbers for lockers and bike racks in the relevant specification is against standard practice for preparing specifications (17).*

GBCA Response: It must be demonstrated that the racks and lockers required in the credit will be purchased and installed as part of the base building for the credit to be awarded, if a project team considers that they are achieving the credit, but with alternate documentation, a CIR can be submitted.

### **Tra-4 'Commuting Mass Transport'**

*It was suggested that the responsibility for providing public transport is outside the scope of influence of the applicant (8).*

GBCA Response: The development of a retail centre has large influence on the local community and the local planning authorities; the developer can proactively influence the mass transport provisions to and from the site.

*It was suggested that this may impact the choice of location for new centres to be built, however it negatively impacts existing centres, who need to be encouraged to go through the rating, and will be deterred due to this (8).*

GBCA Response: The credit is deemed to be relevant to existing retail centres, because the environmental impact is relevant to existing buildings. The credit is also about providing good connections to the nearby existing residential buildings.

*It was suggested that the points in Proximity to Public Transport are not available to new regional centres. These centres are built on a totally undeveloped land based on council zoning and growth strategies and plans. Actual transport development may take years to be developed after an area is developed and occupied by residents. The tool is biased toward inner suburban redevelopments only and as such the tool will severely limit its ability to influence the vast majority of new centres (10, 8).*

GBCA Response: Green Star credits are established on the basis of environmental impact. GBCA acknowledges that some Green Star credits can be more challenging in an urban setting, whilst others can be more challenging in a rural setting.

*It was suggested that the credit criteria is very onerous/difficult to achieve, and that the criteria should be relaxed. Different criteria need to be set for regional centres, or already existing centres that are not within proximity to public transport (17).*

GBCA Response: One of the mission statements of Green Star is for it to be used for market transformation. While at the moment this may seem unreasonable for the Australian market, these types of facilities are common in Europe and other densely populated urban areas.

*It was suggested that retail centres are not only popular during peak hours (for staff) but also on weekends and evenings (for consumers). Transport calculator should be updated to include weekend and evening services (6).*

GBCA Response: Evening and weekend services have been addressed within the Green Star – Retail Centre v1 Transport Calculator.

#### **Tra-6 'Trip Reduction Mixed Use'**

*It was suggested that this is an initiative that can substantially reduce transport related energy consumption and therefore should be worth more points (3, 6).*

GBCA Response: The TWG agreed that the credit should remain being worth one point in the Transport category. The number of points available for each credit is related to the other credits within the same category.

*It was suggested that the credit is achievable for new centres, however is extremely challenging commercially. But for existing centres, it could be prohibitive, as these already exist in an area that possibly does not meet this criteria. Usually shopping centres are within residential areas, however this will cause a disadvantage to some regional centres. And this needs to be considered (10).*

GBCA Response: Green Star credits are established on the basis of environmental impact, not ease of attainment. It is not necessary for a project to achieve all credits in the Green Star tools to achieve a Green Star rating; not achieving a credit does not prohibit any project from achieving a Green Star rating.

*It was suggested that this credit not is worthwhile; nothing different needs to be done to achieve this credit (13).*

GBCA Response: It is noted that site selection plays an important role in achieving this credit, the criteria for 'dedicated connections' has been expanded to address pedestrian and cyclist safety.

## Water

### Wat-1 'Occupant Amenity Water'

*It was suggested that whilst the reasoning behind this credit is justified, currently there is no commercially acceptable payback for these initiatives, thus the centre owner needs to be committed to reducing consumption regardless of payback (10).*

GBCA Response: Credits are based on environmental impact, not on cost.

*It was suggested that clarification is required as to whether the water use is exclusively for inside the building or extends to landscaped areas on the site (12).*

GBCA Response: This credit refers to amenities only. Wat-3 refers to landscape and irrigation areas of the building. This has been clarified in the Technical Manual.

*It was suggested that the requirement for tanks should be stated in the Credit Criteria / Requirements (17).*

GBCA Response: This has been clarified in the Technical Manual.

*It was suggested that the tank size calculation requires a 20 day storage capacity to service the toilet flushing and 20 days irrigation [incorrect]. This may be applicable for office buildings with little or no irrigation requirements. This requirement discourages the provision of "green" resting places for staff and visitors (17).*

GBCA Response: The 20 day storage capacity solely applies to toilet flushing. This requirement is not placed on the water storage capacity for irrigation.

*It was suggested that the credit does not currently apply to rainwater or recycled water used for wash down areas (6).*

GBCA Response: Currently this is not addressed within the occupant amenity water, as it was considered to be operational use, however the submitted feedback will be considered in the ongoing review of the credit for future versions of the Green Star – Retail Centre rating tool.

*It was suggested that the calculator seems to assume one flush per visitor to the shopping centre and 30 second tap use, which seems excessive. The assumption, that 100% of all visitors using the toilet, increases the water consumption and the tank size artificially. Recent measurements at X project indicate that only 30-35% (more measurements need to be done) of all visitors will use the toilets.*

*It was also suggested that we evaluate the validity of this assumption, by forming agreement with PILOT tool participants to provide visitor data and water use data from BMS to determine appropriate demand estimates. One visitor in three might be more appropriate (13).*

GBCA Response: The usage rates used in the potable water calculator for the Green Star – Retail Centre v1 rating tool have been amended based on sample data received.

*It was suggested that control requirements for tenants should be benefited due to the large impact tenants have on the water consumption of a retail centre. Ten points should only be offered if tenant engagement is included. If not, it may be appropriate to reduce points offered and add a separate credit for tenant engagement (6).*

GBCA Response: The Green Star – Retail Centre v1 rating tool assesses retail centre base buildings; it does not address tenancy fitouts. The points available in a credit determine their importance in the category relative to the other credits in that category. The categories are then weighted against each other using environmental weightings.

*It was suggested that water consumption related to washing in food court areas and that credits should be given to centres that incorporate central washing areas instead of each trader carrying out its own washing (1).*

GBCA Response: Water consumption in the food court areas was not considered to be a major water use within retail centres, thus no extra credit has been developed.

### Wat-2 'Water Meters'

No feedback received.

### **Wat-3 'Landscape Irrigation'**

*It was suggested that this credit can be too easily achieved if only a very small area of landscape is provided. If only a small area of landscaping is provided this credit should be N/A (6).*

GBCA Response: This has been addressed in the Green Star – Office v3 rating tool update and the changes adopted into the Green Star – Retail Centre v1 rating tool.

*It was suggested that landscaping areas in retail centres are generally greater than that of office buildings and hence use more water. Therefore the use of efficient irrigation systems should be more heavily weighted and/or a benchmark provided for irrigation water use (i.e. L/sq.m./year) which may encourage the use of water efficient landscaping (12).*

GBCA Response: The points available in a credit determine their importance in the category relative to the other credits in that category. The categories are then weighted against each other using environmental weightings.

A certain percentage of water is required to be from on-site rainwater collection or recycled water. This results in this credit being easier to achieve when the irrigation system is more efficient because the total volume required to be collected or recycled will be less.

*It was suggested that this may be better addressed under the Land Use and Ecology credit (12).*

GBCA Response: This category is concerned with water usage and as such water used for irrigation is considered to be relevant for this category.

### **Wat-4 'Heat Rejection Water'**

*It was suggested that closed circuit evaporative coolers are not addressed (6).*

GBCA Response: The GBCA are currently considering this issue within the context of the whole suite of Green Star rating tools.

*It was suggested that there should be a special exemption if the cooling towers achieve six cycles of concentration and natural ventilation reduces cooling tower water consumption. More than four points should be available if this is achieved (6).*

GBCA Response: The GBCA are currently considering this issue within the context of the whole suite of Green Star rating tools.

*It was suggested that this credit appears to be weighted too highly when compared to the other credits in this category. The penalty for using cooling towers appears to far outweigh any energy savings made in ENE-1; reduce available points to 4 (12).*

GBCA Response: The points available for this credit were determined based on the relationship between the relative consumption of this item compared to the total water consumption of an average shopping centre. The relationship between the water and energy categories is addressed by the category weightings.

*It was suggested that cooling tower bleed water should be recycled. If this initiative can not be rewarded here, it should be rewarded with another credit (6).*

GBCA Response: If the water used is of a recycled nature, then the water savings will be picked up in Wat-1 as amenity water.

*It was suggested that another category should be introduced to recognise the water minimisation strategies of using new products on the market such as the Muller 3C coolers and the special BAC cooling towers with low water usage (5).*

GBCA Response: The GBCA are currently considering this issue within the context of the whole suite of Green Star rating tools. Green Star is not intended to be a prescriptive tool and as such points are not awarded for specific products, but for achieved outcomes. Green Star looks to focus more on impacts rather than solutions.



**Wat-5 'Fire System Water'**

*It was suggested that the credit criteria does not appear to include fire pump pressure relief valve flow which can be a significant water flow during testing. Update credit criteria to capture the water from the fire pump pressure relief valve (12).*

GBCA Response: Water consumption from testing of the fire pump pressure relief valve was not considered to be a significant enough water use to warrant specific inclusion in the credit.

## Materials

### General

*It was suggested that the weighting of materials used in a shopping centre should be set at 20%. The embodied energy, water and other environmental impacts of building materials due to production is higher than the 10% allocated in this design tool. Although this is harder to measure than direct resource use it is an important issue when evaluating the environmental impact of a building of this nature. An increase in the order of 10% will allow the rating tool to better achieve the environmental goals of Green Star (9).*

**GBCA Response:** These are important issues, though this credit only applies to base building. TWG reviewed the category weighting, but found no cause for this to be amended for release of version 1 of the tool.

*It was suggested that internal material elements of the design of a shopping centre are not sufficiently addressed at present. Essential elements include: fittings, flooring and ceilings. Having environmentally preferable building elements will improve the depth of the design rating tool. A recommendation was made that 25% of the 20% weighting for the Materials Category (5% of total) requested above be allocated to internal material elements (9).*

**GBCA Response:** It is agreed that this is an important issue for retail fit-outs, however tenancies are not addressed within the scope of the Green Star – Retail Centre v1 rating tool, therefore their fitout elements are excluded from the requirements of this credit.

### Shell & Core or Integrated Fitout

*It was suggested that shell and core is common practice for shopping centres as the tenancies are not fitted out by the developer, however switchboards and ducts etc. are normally provided (6). It was suggested that the exclusion of switchboards to achieve the point for shell and core conflicts with Ene-3 'Tenancy Sub-metering' (6).*

*It was suggested that this credit conflicts with other credits which include tenant spaces, e.g. IEQ-2 (6).*

*It was suggested that the impact of this issue is less than that for offices, therefore the one point available seems appropriate (6).*

*It was suggested that when developing a shopping centre the shops are pre-determined as far as usage is concerned. This determines the air conditioning ducting and the switchboard (17).*

*It was suggested that the shell and core option needs to be agreed to by the tenants, and if integrated fitouts, the tenants need to agree to this, and with Majors, this will pose difficulty as they usually have their own specification and guideline that the centre developer needs to follow (10).*

*It was suggested that it is appropriate that the "shell & core" definition be amended for shopping centres to promote minimum waste per the intent of the credit (13).*

**GBCA Response:** The TWG agreed to remove this credit from the tool. Shell & core was considered to be standard practice in retail centre developments.

### Mat-1 'Recycling Waste Storage'

*It was suggested that the type of streams to be recycled can not be controlled by the developer and is not a design issue (6).*

**GBCA Response:** The intent of this credit is to provide a space that is available for tenants to use for storing the detailed recyclable waste streams.

*It was suggested that clarification of the requirements is required. This credit could also address the use of segregated bins in one credit for providing recycling bins in the centre, and one or two credits for providing adequate recycling areas for tenants (12).*

**GBCA Response:** Segregated recycling bins within the shopping centre are considered to be an operational measure rather than a design issue.

*It was suggested that the tool should be made relevant for all of Australia and not only referencing the City of Sydney Code. State relevant equivalents by state or territory to give ALL locations this option (13).*

GBCA Response: It is solely the access requirements of the City of Sydney document that need be adhered to for achieving this requirement of the credit - this is considered to be a best practice document in this respect across Australia. If a project team consider that an element of this guide is not relevant to their project, a CIR can be submitted.

*It was suggested that the definitions for the area based calculator are unchanged from the Green Star - Office Design Technical Manual. Amend the definition and area based calculations to reflect retail environment (13)*

GBCA Response: The Credit Criteria has been revised to no longer refer to required areas.

#### **Mat-2 'Building Re-use'**

No feedback received.

#### **Mat-3 'Recycled-Content & Re-used Products and Materials'**

*It was suggested that a 'deemed to satisfy' approach for 3rd party certified products should be introduced (9).*

GBCA Response: This is pending the establishment of new criteria for independent certification bodies and their standards. The GBCA may consider extending recognition of 3rd party certified products into other rating tools in the future.

*It was suggested that the wording in the credit is unclear, for example: "Addressed by credits Mat-2 to Mat-8 is unclear" (13).*

GBCA Response: This has been clarified within the Technical Manual. The intention is for there to be no double counting of re-used materials.

*It was suggested that the capacity to claim credits for re-used material under this credit is important as it encourages use of significant amounts of re-used materials (>0.1%) in projects where it has not been possible to achieve the high level of compliance requirements under materials credits Mat-2 to Mat-8. If this credit is denied the Green Star tool risks reducing the incentive (getting a point) to use re-used materials where it is not possible to achieve the very high proportions of materials demanded under credits Mat-2 to Mat-8. For example, if credits were driving design decisions and recycled timber could not be claimed under this credit or under the strict compliance requirement of Mat-8, then the recycled timber on the façades might have been substituted for a new material with higher environmental impact, such as steel (13).*

GBCA Response: This is currently less onerous than the requirements in the Green Star – Office v3 rating tool. GBCA acknowledges that this is a stretch credit for projects.

*It was suggested that this credit appears unrealistic (17).*

GBCA Response: The feedback did not include any detail about what aspect of the credit was unrealistic.

#### **Mat-4 'Concrete'**

*It was suggested that blended cement using fly ash and/or slag from industrial processes provides a significant environmental gain through the reduction of greenhouse gasses. Blended cement using fly ash and/or slag should be recognised as an additional point or given full points for its category (9).*

GBCA Response: Up to two points are currently available for substituting Portland cement with industrial waste product(s) (except those that have come from industrial facilities co-fired with hazardous waste).

*It was suggested that a 'deemed to satisfy' approach for 3rd party certified products should be included (9).*

GBCA Response: This is pending the establishment of new criteria for independent certification bodies and their standards. The GBCA may consider extending recognition of 3rd party certified products into other rating tools in the future.

*It was suggested that aerated concrete is an environmentally innovative product that offers energy savings due to its insulation characteristics. Autoclaved Aerated Concrete Products (AAC) should be given full points in the category (9).*

GBCA Response: Energy savings are rewarded within the energy category, this category is concerned solely with materials.

*It was suggested that cement represents both a significant environmental impact and material quantity in a shopping centre. Allocating a proportional weighting for this category should thus be a priority. The weighting of cement in the materials category should be higher. We recommend that 25% of the 20% weighting for the Materials Category (5% of total) requested above be allocated to cement (9).*

GBCA Response: The TWG reviewed the points values and category weightings, but found no cause for this to be amended for release of version 1 of the tool.

*It was suggested that there is no benefit here for minimising concrete use, which would probably be more effective than using recycled content. Post-tensioning and other strategies which strengthen concrete and minimise its use should be encouraged, if not in this credit as a separate credit (6).*

GBCA Response: The GBCA is currently engaging with the stakeholders in this industry. The engagement process aims to refine this credit. The process concerns all the Green Star rating tools; the Green Star – Retail Centre v1 rating tool will be updated accordingly when the stakeholder engagement process proceeds. In the meantime this credit has been updated to be in line with the Green Star – Office v3 rating tool.

#### **Mat-5 'Steel'**

*It was suggested that a 'deemed to satisfy' approach for 3rd party certified products should be included (9).*

GBCA Response: This is pending the establishment of new criteria for independent certification bodies and their standards. The GBCA may consider extending recognition of 3rd party certified products into other rating tools in the future.

#### **Mat-6 'PVC Minimisation'**

*It was suggested that the assumption is made that existing PVC pipes will not impact the rating negatively if re-used as the rating is based on cost (assuming that the cost only applies to extra PVC used) (10).*

GBCA Response: For refurbished buildings, existing PVC materials that are not being replaced are excluded from the cost calculations.

#### **Mat-7 'Sustainable Timber'**

*It was suggested that a 'deemed to satisfy' approach for 3rd party certified products should be included (9).*

GBCA Response: This is pending the establishment of new criteria for independent certification bodies and their standards. The GBCA may consider extending recognition of 3rd party certified products into other rating tools in the future.

*It was suggested that FSC certified timber is virtually unachievable in Australia. A more relevant local regulatory body is needed (13).*

GBCA Response: A review of this credit is currently underway. Ahead of the outcomes from this review the GBCA has aligned the credit with the changes made to the Green Star – Office v3 rating tool, allowing the possibility of achieving one or two points rather than only being able to achieve the two.

*It was suggested that formwork should be excluded from this credit as it is a temporary construction material. Other construction materials such as scaffolding, fencing and site sheds are not addressed in the tool so not sure why formwork is included here.*

*It was also suggested that this credit should exclude formwork if it is to be consistent with the rest of the tool. However as formwork is a significant use of timber it should not be ignored. Maybe include a point for formwork and another for other uses or possibly a different credit for formwork (6).*

GBCA Response: A review of this credit is currently underway. Ahead of the outcomes from this review the GBCA has aligned the credit with the changes made to the Green Star - Office v3 rating tool, allowing the possibility of achieving one or two points rather than only being able to achieve the two.

#### **Mat-8 'Design for Disassembly'**

*It was suggested that proving compliance with this credit could prove very difficult (6).*

GBCA Response: Documentation required should be readily available if the credit criteria have been met, if a project team considers that they are achieving the credit, but with alternate documentation, a CIR can be submitted.

*It was suggested that this credit is very costly (10).*

GBCA Response: The GBCA is continually looking for means to decrease the costs associated with the compliance requirements of Green Star credits. Any suggestions from industry are welcomed; however the GBCA develops credits based on environmental impact, not on cost.

*It was suggested that the approach rewards adaptability for steel structure that is demountable. There should be inclusion of credits for concrete structures that are adaptable also, for example the construction of multi-level car parks capable of conversion to retail during future redevelopment (13).*

GBCA Response: Noted. The submitted feedback will be considered in the ongoing review of the credits for future versions of the Green Star suite of tools.

#### **Mat-9 'Dematerialisation'**

The TWG agreed to introduce this credit in version 1 of the Green Star – Retail Centre rating tool.

## Land Use & Ecology

An Ecology Expert Reference Panel is being convened to assist the GBCA in development and on-going review of the Land Use and Ecology category. The initial focus of this panel will be the Ecology Conditional Requirement.

### General

*It was suggested that a credit in Land Use and Ecology which encourages land use efficiency should be introduced. The criteria could involve a GFA to site ratio (6).*

GBCA Response: The intent of this comment is addressed within the Land use and Ecology credit Eco-4.

*It was suggested that the vast majority (80% to 90%) of new centres are developed on greenfield regional land where there is currently no development at all. These centres are the start of building a community. The centres will be built in these areas due to planning requirements for residential and commercial development. Whilst there may be a justifiable environmental basis for favouring existing sites over greenfield sites, in terms of their land use and ecological impact, existing sites are not available as they quite simply do not exist in these developing communities. Further work is therefore required to consider the overall environmental footprint of new vs. existing centres (8). It was suggested that the developer should be encouraged to use the Green Star tool to build a better, more sustainable centre, rather than be penalised for developing on a greenfield site, when a choice is simply not available. Further to this, a greenfield site usually services a region in which customers currently travel long distances to find equivalent services. In this example, land use and ecological impacts must therefore be weighed with community transport and greenhouse impacts (8).*

GBCA Response: Green Star credits are established on the basis of environmental impact. GBCA acknowledges that some Green Star credits can be more challenging in an urban setting, whilst others can be more challenging in a rural setting. It is not necessary for a project to achieve all credits in the Green Star tools to achieve a Green Star rating; not achieving a credit does not prohibit any project from achieving a Green Star rating.

### Eco – Conditional Requirement

*It was suggested that the credit should not be made conditional as, if it is, it will impact upon the building of new regional centres as most land there would have agricultural value (10).*

*It was suggested that it was of great concern that Eco-1 'Ecological Value of Site' no longer contained a mandatory requirement preventing development within 100m of a natural wetland. As an environmental scientist, with 5 years of experience in Environmental Impact Assessment, the respondent was greatly concerned that the Green Star – Shopping Centre Design PILOT had lowered its stance on the protection of such a valuable ecosystem (3).*

*It was suggested that it is of high concern that Eco-1 'Ecological Value of Site' is no longer a mandatory requirement and that the Green Building Council of Australia, an environmental organisation, has lowered its benchmarks and lowered the protection of such important ecosystems. There is a wealth of evidence to suggest that wetlands can provide urbanised areas with an array of valuable ecosystem goods and services including (but not limited to) habitat provision for local species and internationally significant migratory birds, filtration of water flowing from upstream and from the catchments (which also benefits downstream areas), flood buffering and bank stabilisation, as well as potentially providing amenity and recreational opportunities (4).*

GBCA Response: In response to stakeholder feedback regarding the wetland aspect of this requirement for the Green Star – Retail Centre rating tool, and with the aim of ensuring the most robust environmental outcome for the Eco-Conditional Requirement, in June 2008 the GBCA invited expressions of interest from ecologists, with expertise in wetlands and ecological restoration, to participate in an Expert Reference Panel (ERP). In July two Panels met, in Brisbane and Melbourne, to discuss features and definitions of wetlands requiring protection, as well as Compliance Criteria and methodologies for wetlands restoration.

The consultation process with the Ecology ERP is ongoing, with outcomes-to-date currently being collated and reviewed. It is anticipated that significant changes may be made to the wetland aspect of the Eco-Conditional Requirement in the near future. Whilst ongoing items are finalised any

changes to this conditional requirement are in abeyance, therefore the existing Eco-Conditional Requirement should be adhered to, to ensure eligibility.

ANY AMENDMENTS, WHEN MADE, WILL BE POSTED ON THE GBCA WEBSITE AND WITHIN THE GBCA NEWSLETTER.

*It was suggested that a term other than "local development plan" should be used since the local council did not know what this referred to (13).*

GBCA Response: GBCA has worked to ensure that all documentation requested is as per industry terms.

*It was suggested that the terms 'Wetland' and 'Prime Agricultural Land' should be defined (17).*

GBCA Response: Agreed, the terms are defined in the Technical Manual.

#### **Eco-1 'Topsoil'**

*No feedback received*

#### **Eco-2 'Re-use of Land'**

*It was suggested that the credit is okay for existing centres, however it may impact upon the development of new centres (10).*

GBCA Response: Green Star credits are established on the basis of environmental impact. GBCA acknowledges that some Green Star credits can be more challenging for existing projects, whilst others can be more challenging for new projects. It is not necessary for a project to achieve all credits in the Green Star tools to achieve a Green Star rating; not achieving a credit does not prohibit any project from achieving a Green Star rating.

#### **Eco-3 'Reclaimed Contaminated Land'**

*It was suggested that this credit may negatively impact new centres (10).*

*It was suggested that the credit should be NA for refurbished buildings and not extensions (13).*

GBCA Response: This has been addressed; the credit is now 'Not Applicable' for projects which are refurbishments or building extensions, and is excluded from the points available used to calculate the Land Use & Ecology Category Score.

#### **Eco-4 'Change of Ecological Value'**

*It was suggested that for fully developed sites in built up areas that are undergoing redevelopment there seems little value in going through the ecological calculator; an 'N/A' option should be allowed (13).*

GBCA Response: All credits are optional, design teams can choose not to go for this credit.

## Emissions

### General

*It was suggested that Green Star should ensure grease arrestors are provided where appropriate (6).*

GBCA Response: The GBCA acknowledges that grease arrestors are a useful feature for reducing watercourse pollution. However, grease arrestors are required by legislation as part of a license to discharge. Green Star aims to drive industry to the adoption of best practice, rather than to reward compliance with legislation.

*It was suggested that food tenants may use a significant amount of oil for cooking and as such there should be a credit for centres which provide storage and recycling areas for cooking oil (12).*

GBCA Response: Green Star assesses inherent building attributes; this was considered to be an operational issue and as such falls outside the scope of this rating tool. Tenancies are not addressed within the scope of the Green Star – Retail Centre v1 rating tool.

*It was suggested that food tenants within shopping centres typically install refrigeration systems with air cooled condensers and long refrigerant pipe runs. The long pipe runs result in a large amount of refrigerant in the building. One way to minimise the amount of refrigerant used and it's potential to leak is to provide a central heat rejection loop. Whilst this may not be common and refrigeration contractors may have to adjust their equipment this would reduce the amount of refrigerant within the shopping centre (12).*

GBCA Response: Tenancies are not addressed within the scope of the Green Star – Retail Centre v1 rating tool, therefore their fit-out elements are excluded from the requirements of this credit.

### Emi-1 'Refrigerant ODP'

*The incorporation of an ODP level of up to 0.02 was suggested, so that HCFC-123 is assessed in the same light as other HFC synthetic refrigerants which have zero ODP should be allowed. There are some conflicts between the ODP and GWP credit. Synthetic refrigerants that achieve this credit tend to have a relatively high GWP. For example a zero ODP requirement here exempts the use of energy efficient, low leakage, low GWP HCFC-123 refrigerant. Synthetic refrigerants that qualify for this credit such as HFC-134a, HFC-407C, HFC-410A have relatively high GWP. HCFC-123 does not score any of the ODP or GWP credits (Emi-1 and Emi-2) (11).*

GBCA Response: Green Star aims to encourage the uptake of natural refrigerants not lower the benchmark (by raising the allowable value).

*It was suggested that refrigerants that have the "Environmental Choice Label" by Good Environmental Choice Australia will be considered to have an ODP of zero, since all refrigerants certified under the refrigerant standard are tested to ensure an ODP level below 0.01. Thus certified refrigerants have a low ODP level as well as other good environmental characteristics (9).*

GBCA Response: This is pending the establishment of new criteria for independent certification bodies and their standards. The GBCA may consider extending recognition of third party certified products into other rating tools in the future.

*It was suggested that absolute zero emissions does not allow for smaller technological advances (17).*

GBCA Response: The GBCA is not seeking to promote the use of the less damaging ozone depleting substances, but rather to eliminate their use altogether, in favour of those with no ozone depleting potential, or in the direction of no refrigerants altogether.

### Emi-2 'Refrigerant GWP'

*It was suggested that the benchmark value needs to be increased considering the maturity of the market, and the challenge potentially being too steep at this stage (10).*

*It was suggested that the only refrigerants that could comply with this are ammonia and CO<sub>2</sub>. CO<sub>2</sub> cannot practically be used at air conditioning temperatures. I don't know of any ammonia systems used in air conditioning in Australia. This point will rarely be used (5).*



GBCA Response: Green Star aims to encourage the uptake of natural refrigerants not lower the benchmark (by raising the allowable value). The Credit Criteria has been revised to reward the switch to natural refrigerants in some of the refrigeration loops, as follows:

One point = 50% of the fluorocarbon refrigerant charge has been replaced with refrigerant(s) that have GWP of 10 or less; and

Two points = all refrigerants that have GWP of 10 or less OR no refrigerants are used.

*It was suggested that refrigerants that have the “Environmental Choice Label” by Good Environmental Choice Australia will be considered to have a GWP below 10, since current refrigerants certified under the refrigerant standard have a GWP of below 10. The next version of this standard will specify a GWP in this range as well as the other environmental requirements. Thus certified refrigerants have low GWP levels as well as other good environmental characteristics (9).*

GBCA Response: This is pending the establishment of new criteria for independent certification bodies and their standards. The GBCA may consider extending recognition of third party certified products into other rating tools in the future.

*It was suggested that absolute zero emissions does not allow for smaller technological advances (17).*

GBCA Response: The GBCA is not seeking to promote the use of the less damaging ozone depleting substances, but rather to eliminate their use altogether, in favour of those with no global warming potential, or in the direction of no refrigerants altogether.

### **Emi-3 ‘Refrigerant Leaks’**

*It was suggested that the requirement of “Moderately Air Tight” has to be viewed in conjunction with the cooling requirement of the chiller (17).*

GBCA Response: The Emission category assesses emissions from the building. Cooling requirements are a different issue that is not assessed within this category.

*It was suggested that the proposed changes to this credit for the Green Star – Office v3 rating tool, should also be applied to the Green Star – Retail Centre v1 rating tool (6).*

GBCA Response: Agreed, this change has been adopted.

*It was suggested that auto-pumpdown for built up direct expansion systems should be specified. For chillers to earn this credit, they must be of a hermetic type and use a low pressure refrigerant which has an offline pressure less than atmospheric pressure. Commercial chillers commonly used in buildings today do not have an automatic pumpdown feature. The intent of this credit is to minimise the direct emission of refrigerant into the atmosphere from leaky systems (11).*

GBCA Response: Noted, however the feedback does not provide any suggestions about how the credit should be changed and improved. Credit Interpretation Requests (CIRs) are available when a project believes that the aim of a credit is met in a different yet equivalent way.

*The Green Star PILOT assessment tool for Shopping Centres awards one Emissions credit for designs which reduce or prevent the unnecessary loss of refrigerant in the event of a leak. While the intent of this Emission credit promotes the reduction or elimination of refrigerant leaks which contribute directly to global warming, the assessment methodology needs to be improved, particularly for large installations where chilled water is used for air conditioning. The current PILOT version of the Green Star Assessment tool for Shopping Centres is similar to other tools for other building types in this respect. It awards one credit to designs where there is the provision for automatic pumpdown to a heat exchanger or storage tank with isolation valves. In consideration of awarding designs that minimise refrigerant leakage, I have provided the following input to the Green Building Council Australia. If the system is a split system in the form of direct expansion or chilled water (with remote condenser), automatic pumpdown is required so that the system stores the refrigerant in a vessel on shut down. If the system has packaged chiller sets that serve a chilled water plant, the following items will be required to earn the Emi-4 credit:*

- Use of hermetic or semi-hermetic compressors (not open drive compressors)
- Low pressure refrigerant with a purge (must be qualified by high efficiency purge)

*The second point needs to be qualified by the use of a low pressure refrigerant which has an off-line pressure lower than atmospheric pressure (such as HCFC-123) as well as a high efficiency purge having more than 99.5% efficiency. A low pressure refrigerant such as HCFC-123 is essentially "stored" in the evaporator of the chiller in liquid state when the chiller is switched off. This is a function of the properties of the refrigerant type and the evaporator is also the lowest point of the chiller. This is part of a stakeholder feedback I provided to the Green Building Council Australia which also covers consideration for reviewing the ODP and GWP criteria (13).*

GBCA Response: Noted, however the feedback does not provide any suggestions about how the credit should be changed and improved. Credit Interpretation Requests (CIRs) are available when a project believes that the aim of a credit is met in a different yet equivalent way.

#### **Emi-4 'Watercourse Pollution'**

*It was suggested that this credit should be given more weight as greater impact will be achieved when compared to office (6).*

GBCA Response: Whilst we acknowledge that the gains for reducing watercourse pollution may be significant, the relation between the credits in the Emissions category for the Green Star – Retail Centre v1 rating tool is deemed to be consistent with the relation between the credits in the emissions category in the Green Star – Office v3 rating tool. The points allocation was not changed.

*It was suggested that the credit is inflexible in the approaches to achieving stormwater treatment (13).*

GBCA Response: The feedback did not include any information about how the credit was inflexible or suggestions about how the credit could be modified, the GBCA are happy to consider and take on board recommendations throughout the tool review process.

#### **Emi-5 'Discharge to Sewer'**

*It was suggested that the points offered in this credit need to be consistent with the final point allocation for Wat-1 (6).*

GBCA Response: The differences are intentional as this credit has a different use and aim.

#### **Emi-6 'Light Pollution'**

*It was suggested that more flexibility is required in the evidence needed to prove points. The Planning Permit (and SMP) requirement, together with light fitting specification and tender drawings, plus review by the Electrical Engineer once a tender package is awarded should be adequate in instances where the works are D&C (13).*

GBCA Response: If alternate means of compliance which meet the aim of the credit are proposed, a CIR can be submitted.

*It was suggested that it would be better to minimise the light pollution by, for example, specifying the max Lux per light which could be directed into the night sky, since light in shopping centres is being used as a feature.*

GBCA Response: This has been addressed in version 1 of the tool. The criteria now requires that 95% of outdoor spaces do not exceed minimum requirements AS1158 for illuminance levels.

#### **Emi-7 'Legionella'**

*It was suggested that this credit will discourage the use of cooling towers, but in turn may impact negatively on the reduction of peak demand as absorption chillers which would be very good for reduction of peak demand when combined with co-gen, have cooling towers, these then may not be looked at favourably (10).*

GBCA Response: This category is concerned with emissions from the building, the energy category considers energy usage. Project teams are able to choose which credits to go for when considering servicing strategies.

*It was suggested that it is questionable how this credit is environmentally sound when air cooled systems have such poor COPs relative to water cooled systems (5).*

GBCA Response: Credits within the Emissions category are developed in response to the environmental impacts of emissions from buildings, just as the credits within the Energy category

are developed in response to the environmental impacts of energy associated with buildings. The category weightings then consider the relative 'weighting' of the categories in comparison to each other. Project teams are able to choose which credits to go for in which categories when considering servicing strategies.

## Innovation

### General

*It was suggested that transparency of some of the credits needs to be improved, specifically in regard to the credits granted for "Innovation". In the current PILOT tool, credit for project innovation is at the discretion of the GBCA. There is no criterion or objective measure to assess what is considered innovative (8).*

GBCA Response: These credits have been clarified within the Technical Manual.

### Inn-1 'Innovative Strategies and Technologies'

*It was suggested that all innovation points are very subjective and are dependent on the view of the GBCA. There is no clear criteria on what is considered to be innovation, or whether an innovation point achieved can be carried through to another centre being refurbished/developed by the same developer/owner.*

*Clearer criteria for innovation points to make these more measurable and objective are required. Similarly, leveraging of these points to other projects if the original innovation point was achieved by the same owner of the project (10).*

GBCA Response: These credits have been clarified within the Technical Manual.

## General

*It was stated that there are two main types of centres, Bulky Goods Centres and General Retail Centres. They are designed to quite different parameters and are quite different in their nature. Bulky Goods Centres are characterised by low occupancy during the week and most of the time and low internal loads. Shouldn't these types be separated? (5).*

GBCA Response: Please see the eligibility criteria for the Green Star – Retail Centre v1 rating tool. Bulky Goods Centres are not eligible for assessment under the Green Star – Retail Centre v1 rating tool.

*It was stated that general retail shopping centres contain the following types of tenants:*

- Large Supermarkets - Coles Woolworths
- Department Stores - Grace Bros
- Discount Department Stores - Big W Target K Mart
- Large Tenancies 500-1000sqm - Rebel JB HiFi
- Small Shops

*Each of these types are very different in their design requirements, type of equipment specified in their own briefs and the resultant energy usage. Shouldn't there be differentiation in the PILOT for all these disparate uses (just as you are distinguishing between Offices, Retail and Health in your PILOT Tools) particularly between the Supermarkets, the Majors and the rest? (5).*

GBCA Response: The Green Star – Retail Centre v1 rating tool assesses retail centre base buildings; it does not address tenancy fitouts.

*It was stated that the types of air conditioning systems used in shopping centres are different to office buildings and the tenant changes are usually handled as part of the main systems not separate condenser water systems as is often the case on office buildings. It was suggested that these fundamental differences should be reflected in the design of the PILOT tool (5).*

GBCA Response: The Green Star – Retail Centre v1 rating tool assesses retail centre base buildings; it does not address tenancy fitouts. The Energy Calculator for this tool has been specifically developed to address retail centres and acknowledges the different servicing strategies.

*It was suggested that detailed definitions of areas are required (i.e. base building, common areas, tenancies etc) to be included in the design manual. For example a typical shopping centre could include centre management offices, malls, amenities, plant rooms, back of house areas, banks, gyms, specialty, fast food, restaurants, mini majors, majors etc. and which of these are included in each credit criteria needs to be made clear (12).*

GBCA Response: This has been included within the Technical Manual and the Green Star – Retail Centre v1 rating tool Energy Calculator Guide.

*It was stated that the Green Star tools request contractual evidence in many instances. It was suggested that whilst the intent is understood, the nature of some developers and their in-house management and development, construction and operations does not allow contractual evidence to be permitted in certain instances. In these instances it was recommended that alternate evidence such as commitment letters between the various operation/ construction/ development sections of the developers be accepted as evidence (7).*

GBCA Response: If a project team considers that they are achieving the credit, but with alternate documentation, a CIR can be submitted.

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28<sup>th</sup> August 2008