

Stakeholder Feedback Report for Green Star – Industrial

Outcomes of PILOT Process Feedback

30 April, 2010

The Green Star – Industrial rating tool was developed by the Green Building Council of Australia (GBCA) in conjunction with its Technical Working Group (TWG) to support sustainable planning, design and construction of high-performance industrial facilities.

The tool development process includes a PILOT period which allows for public review of the tool, as well as testing of credits by a number of project teams through the application of the PILOT tool to specific industrial projects.

The GBCA ensures that the public review period is transparent through a formal stakeholder feedback process; details of which can be viewed in the 'Stakeholder Engagement & Feedback' section of the GBCA website. 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 the public, and as part of the overall process for selected project teams testing the tool. For each item of feedback, the GBCA's response is detailed. As part of the process, any comments received after the public review period has closed will be considered for further improvement of future versions of the Green Star – Industrial rating tool.

The feedback has been organised in a general section and according to the Green Star categories and credits order. The feedback and the responses are provided on the following format:

It was suggested that... (1)

GBCA Response:...

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.

Eligibility

It was suggested that the current approach to deem a project eligible to be rated under the tool if the building has a minimum of 80% of the nominated area as BCA class 7b and/or Class 8 is inappropriate. It is common to find industrial facilities with up to 40 or 50% of office space. The rule should be relaxed to allow for a greater range of industrial buildings to be able to use the tool. (1 & 9).

GBCA Response: Agreed, the GBCA has revised the eligibility criteria as follows:

Buildings primarily used for industrial purposes (e.g. manufacturing and warehousing facilities, distribution centres, etc.) are eligible for assessment under the Green Star – Industrial v1 rating tool provided that they meet the following criteria:

- At least 50% of the building's GLA (measured to exclude internal car parks) is classified as BCA Class 7b and/or 8;
- Up to 50% of the building's GLA (measured to exclude internal car parks) is classified as BCA Class 5; and
- Up to 10% of the building's GLA (measured to exclude internal car parks) is classified as any other BCA class.

It was suggested that BCA Class 6 should be eligible for rating under the tool (5).

GBCA Response: BCA Class 6 buildings are not eligible for the Green Star – Industrial rating tool.

Some BCA Class 6 buildings are covered by the Green Star – Retail Centre v1 rating tool.

Where a large retail component that cannot be assessed by the Green Star – Retail Centre v1 rating tool is included in a building, there may be opportunities to customise the Green Star – Industrial v1 tool, please contact the GBCA for a case by case assessment. An initial review of the necessary amendments for customisation includes changes as follows:

- Occupancy profile and schedule in the methodology for assessing greenhouse gas emissions;
- Amendments to the water calculator for assessment when the building is occupied by a large number of people;
- Changing the Credit Criteria for the Tra-3 'Cyclist facilities' credit to fairly assess the space when occupied by a large number of people;
- Define how the occupied warehouse spaces will be addressed in the IEQ category, which credits to be applicable etc; and
- Consider including the provisions from the Mat-1 'Recycling Waste Storage' credit as per the Green Star - Retail Centre v1 rating tool.

It was suggested that the current criteria prevents developments with separate office/administrative buildings from being eligible for rating. It is proposed that 80% of the buildings Gross Lettable Area (GLA) as BCA Class 7b and/or Class 8 be applied across the combined floor area of all buildings. (9&19).

GBCA Response: A framework for a single rating for multiple buildings has been developed. Some eligibility criteria applies, please contact the GBCA for an eligibility ruling. Guidance on how such assessment can be conducted is provided in the Additional Guidance section of each credit.

Precinct

It was suggested that the definition of 'Precinct' is confusing and does not provide adequate guidance. (9).

GBCA Response: Agreed, the GBCA has reassessed the inclusion of 'precinct' aspects in the rating tool. The rating tool assesses the environmental attributes of buildings. Precinct wide solutions are strategies used to reduce the environmental impact of a number of issues, however not a specific

goal within this tool. The environmental benefits of shared systems and precinct wide solutions are still rewarded in the rating tool. There were four credits that rewarded specific precinct solutions and below is an explanation of the changes for each of them:

- Man-15 Precinct Environmental Management – The credit has been removed from the rating tool as it related to operational processes found within a building, not the attributes of the building itself. (See Man-15 in the Management section below).
- Ene-10 Precinct Energy Systems – The credit has been removed from the rating tool as the reduction of greenhouse gas emissions from shared/precinct energy systems are rewarded in the Ene-1 Greenhouse Gas Emissions credit. (See Ene-10 in the Energy section below).
- Wat-1 Occupant Amenity Water – Non potable water supplied to the building either from an on-site or off-site location is still rewarded in the water calculator as re-used water.
- Mat-1 Recycling Waste Storage – The credit still rewards the use of a centralised/precinct waste storage facility, however no extra points are awarded.

Procurement

It was suggested that the tool does not adequately reflect the way that industrial buildings in Australia are procured. Whilst it is somewhat common for office buildings to be procured through a design, document, tender, construct process; industrial developments very rarely use this procurement model. The 'Design and Construct' method is far more common in industrial developments. The documentation asked for in the compliance requirements does not necessarily exist. Projects will be required to produce specifications and detailed reports for Green Star and the entire cost of these would need to be attributed to Green Star. This makes preparation of the Green Star submission much more costly for Industrial buildings.

In some cases specifications do not exist and key documents in a Design & Construct contract are the sub-contractor briefing documents. (6).

GBCA Response: There are two types of Green Star ratings: Green Star – Design, and Green Star – As Built. For a Green Star – Design, a full set of documentation is required to assess the attributes of a yet to be completed building. At this stage, it is difficult, if not impossible, for Certified Assessors to determine whether the building will achieve a particular credit if no design has yet been done. It is common for Design & Construct projects to significantly change from the contracted brief, to the final design, even more so than on a fully designed building.

For a Green Star – As Built rating, the documentation requirements allow for a full verification that the building at the time of practical completion complies with the relevant credit.

For both types of ratings, alternative documentation options are acceptable via the use of a Credit Interpretation Request. There are a number of Design & Construct projects that are undertaking Green Star ratings that have successfully requested changes to the documentation in a number of credits via this method.

Management

Man-1 'Green Star Accredited Professional'

It was suggested that the requirement for a % of attendance to meetings by the GSAP is a quantitative criterion that may be meaningless in terms of achieving the intent of the credit; and was suggested that a qualitative approach would be more appropriate. (18).

GBCA Response: Agreed, the credit has been revised and amended. The percent of attendance as an indicator of compliance with the Aim of Credit has been removed. The Credit Criteria and Compliance Requirements now include a clearer role and list of expected tasks of the GSAP based on the intent and principles of the Green Star rating tool and the certification process. Compliance with the Credit Criteria will now be demonstrated with a 'Scope of Works' document.

Man-2 'Commissioning Clauses'

It was suggested that the criteria should ask for compliance with the intent of CIBSE and ASHRAE since the codes cannot be applied exactly in the Australian Industry. (17).

GBCA Response: Agreed, the Credit Criteria has been reworded removing the reference to 'exact accordance' with CIBSE and ASHRAE.

It was suggested that the credit should award two points instead of one to better recognise the importance of commissioning in industrial buildings. (17).

GBCA Response: Agreed, the credit has been aligned with all the other Green-Star rating tools and it now rewards two points instead of one. It should be noted that the credit rewards the commissioning commitment, process and transfer of information and not the amount or difficulty of the commissioning in itself.

It was suggested that it should be specified that it is the Independent Commissioning Agent (ICA) should be responsible to provide the Commissioning Report to the building owner at handover. (17).

GBCA Response: The *Man-4 Independent Commissioning Agent* Credit addresses this suggestion. The Compliance Requirements of that credit assign the ICA the responsibility of 'Review (or prepare if agreed with the project team) *the final commissioning report, and prepare and deliver to the building owner an overview report summarising the results of the commissioning process*'. It is not intended to mandate the engagement of an ICA, but rather the encouragement to do so by awarding one point in *Man-4* Credit. Although the involvement of an ICA from design through to handover will increase the likeliness of a sound commissioning process, Green Star recognises that sound commissioning can be carried out without the engagement of one.

It was suggested it should be specified who has to prepare the short report. (17).

GBCA Response: The Credit Criteria states that the design team and contractor are responsible for transferring the information when the additional point is claimed. Since the *short report* is a document to demonstrate compliance with the criteria for the additional point, it is the responsibility of the design team and contractor to prepare this document. The *Documentation* section of the credit has been amended for more clarity.

Man-3 'Building Tuning'

It was suggested that the Aim of Credit should be reworded to: "To encourage and recognise commissioning initiatives that ensure optimum occupant comfort and energy efficient services performance throughout the 12 month period after practical completion" (instead of the current: throughout the year). (17)

GBCA Response: The Aim of Credit has been reworded as follows: "To encourage and recognise tuning initiatives that ensure the building services can operate to optimal design potential after handover". The reference to the timing of the building tuning is included in the Credit Criteria.

It was suggested that compliance requirements should include a point for 'seasonal and climate adjustments to enhance system performance'. (17)

GBCA Response: Agree, although the Compliance Requirements section already includes provisions for verification of performance during all variations in climate, the suggested requirement has been included for more specific guidance.

It was suggested that the building tuning contract must recommend that the ICA is engaged to manage and oversee the tuning process. (17)

GBCA Response: Green Star does not intend to mandate the engagement of an ICA to manage and oversee the tuning process. Although the involvement of an ICA in the tuning process after handover could increase the likeliness of a sound tuning and re-commissioning process, it is recognised that the *Man-3 'Building Tuning'* credit's criteria and compliance requirements to encourage sound tuning can be carried out without the engagement of one. Green Star acknowledges the importance of the engagement of an ICA from the tender phase, through construction, and to the commissioning phase; and rewards this appropriately in the *Man-4 'Independent Commissioning Agent'* credit.

Man-4 'Independent Commissioning Agent'

It was suggested that the amount of points awarded in this credit does not reflect the importance of the involvement of an ICA. (17)

GBCA Response: This credit rewards one point for the appointment of an ICA in all Green Star Rating Tools. The GBCA believes that one point is fair to reward this appointment and the intention

is to encourage this credit as well as Man-2 Commissioning Clauses, and Man-3 Building Tuning for a more integrated approach to sound commissioning and tuning with the aid of the ICA. The GBCA believes that the overall amount of points offered for the commissioning credits is fair.

It was suggested that since there is currently no official certification for ICA's in Australia, referencing ASHRAE & NEBB is good trade practice as long as it does not become mandatory. (17)

GBCA Response: Agreed, the Compliance Requirements and Additional Guidance sections of the credit make reference to NEBB or ASHRAE certified technicians as "examples of professionals with relevant documented working knowledge", and the Compliance Requirements section is also clear in not mandating ASHRAE, CIBSE and/or NEBB accreditation.

Man-5 'Building Users' Guide'

No feedback was received on this credit.

Man-6 'Environmental Management'

It was suggested that an EMP Post Implementation Inspection Final Report can be used to demonstrate compliance with the first point of the Credit Criteria (14).

GBCA Response: Agreed, an EMP Post implementation inspection final report is equivalent to the documentation requirements 'confirmation from the contractor' provided that:

- A comprehensive project-specific EMP is provided as per the provisions of the Credit Criteria and Compliance Requirements; and
- The project can demonstrate that the EMP was implemented from the beginning of the construction of the building.

Man-7 'Waste Management'

No feedback was received on this credit.

Man-8-13 Not applicable to this tool.

Man-14 'Operations Environmental Management' and Man-15 'Precinct Environmental Management'

It was suggested that these credits should be removed from the tool since an Operations Environmental Management System (EMS) deals with operational issues. (18)

GBCA Response: The GBCA has decided to remove these credits since it is not the scope and intention of the rating tool to address operational issues.

Man-16 'Metering'

This credit is introduced to Green Star – Industrial v1 and includes Ene-2 'Energy Sub-metering' and Wat-2 'Water Meters'. No feedback was received on either of those credits.

Indoor Environment Quality

General

Feedback received indicated that a number of credits should not apply to the industrial area, and only apply spaces where people work for extended periods of time. (4)

Furthermore, a number of credits receive large benefits where small non-industrial spaces exist compared to the industrial facility. For example, a 10,000 square meter warehouse might have a 200m² office. In this case, the amount of points received would not be representative of the environmental IEQ impacts found in such a facility (11).

GBCA Response: The GBCA has reviewed each of the individual credits in the IEQ category to assess the impact on both an industrial and a non-industrial space. As such, a number of credits have been modified to only apply to the non-industrial component. Furthermore, as mentioned in the feedback, small non-industrial spaces can quickly take advantage of the available points, increasing the overall IEQ score of the building, without reducing their environmental, or health, impact. To address this, a number of credits become 'Not Applicable' when the non-industrial

space is less than 2.5% of the GFA, up to 500m². To still reward environmental initiatives for these smaller spaces, a new credit 'Small Occupied Spaces' has been created.

A request was made for a credit that addresses the pollutants from indoor vehicle emissions - in the same spirit as the tenant exhaust riser credit. (14)

GBCA Response: Impacts from indoor vehicles emissions are picked up in the credit 'Indoor Pollutants Monitoring and Control'. This credit requires that an air quality assessment of the site and the building's use is made, and that control measures are put in place to reduce the impacts emissions from vehicles and other activities by maintaining good indoor air quality.

IEQ-1 'Ventilation Rates'

It was suggested that this credit provided little benefit in the industrial space. (11)(14)

GBCA Response: Agreed. This credit is now applicable to the non-industrial spaces. It is 'Not Applicable' where the non-industrial space is smaller than 2.5% of the GFA up to 500m², or where the only existing spaces are all industrial areas.

IEQ-2 'Air Change Effectiveness'

It was suggested that this credit provided little benefit in the industrial space. (11)(14)

GBCA Response: Agreed. This credit is now applicable to the non-industrial spaces. It is 'Not Applicable' where the non-industrial space is smaller than 2.5% of the GFA up to 500m², or where the only existing spaces are all industrial areas.

IEQ-3 'CO₂ Monitoring and Control and Other Pollutants Monitoring and Control'

No feedback was received on this credit. This credit has been renamed to 'Indoor Pollutant Monitoring and Control'.

IEQ-4 'Daylight'

Is a Daylight Factor of 2.0% equivalent to 250 Lux? Why use 250 Lux? The Australian Standard stipulates a minimum lux of 160 for warehouse spaces. (11)

250 lux is too high a requirement compared to the 2% daylight factor. (13)

GBCA Response: Green Star requires performance that is better than standard practice. Based on research from CIBSE, the proper daylight factor for most tasks is 2%. As such, this credit has been aligned to that research. The figure of 160lux is roughly equivalent to a 2% Daylight Factor depending on the outside light conditions. To address complaints that the guidance on how to achieve this benchmark is unclear, requirement that the 160lux benchmark only be achieved for 80% of the time has been introduced, as well as software and modelling requirements.

IEQ-5 'Thermal Comfort'

It was suggested that this credit provided little benefit in the industrial space. (11 & 14)

GBCA Response: Agreed. This credit required that a minimum level of compliance be met within the industrial spaces. Two additional points are available for the non-industrial spaces. It is 'Not Applicable' where the non-industrial space is smaller than 2.5% of the GFA up to 500m².

IEQ-6 'Hazardous Materials'

No feedback was received on this credit.

IEQ-7 'Internal Noise Levels'

No feedback was received on this credit.

IEQ-8 'Volatile Organic Compounds'

No feedback was received on this credit.

IEQ-9 'Formaldehyde Minimisation'

No feedback was received on this credit.

IEQ-10 'Mould Prevention'

No feedback was received on this credit.

IEQ-11 'Daylight Glare Control'

It was suggested that the credit criteria are unclear for translucent sheeting. Furthermore, the need for such criteria is questioned. (11)

GBCA Response: The criteria have been clarified to address what the credit is trying to achieve. All viewing facades that can be subject to glare, including skylights and roof lights, must meet the relevant credit criteria.

IEQ-12 'High Frequency Ballasts'

It was suggested that there are other methods available that can be used to comply with this credit instead of high frequency ballasts. Electronic ballasts, LED lighting, constant wattage ballasts, all of these can be used instead. (6)

GBCA Response: This credit has been removed from the tool and merged with Electric Lighting Levels. The guidance for high frequency ballasts is changed to a requirement for flicker free lighting. Flicker free lighting is now defined by performance criteria, rather than a specific technology.

IEQ-13 'Electric Lighting Levels'

It was suggested that it was unclear how this credit applied to the warehouse space. (11)

GBCA Response: Guidance has been expanded within the credit. Industrial spaces must show that the relevant lighting levels do not exceed those quoted by the relevant standard by 25%.

It was suggested that all spaces other than the office spaces have a 25% allowance over the standard. Why was this not included within the office areas. (16)

GBCA Response: The Credit Criteria has been modified. The lighting levels for all spaces must not exceed more than 25% of the relevant standard.

IEQ-14 'External Views'

No feedback was received on this credit.

IEQ-15 'Individual Thermal Comfort Control'

It was unclear how this credit applied to the warehouse space. (11) It was suggested that this credit provided little benefit in the industrial space. (11)(14)

GBCA Response: Agreed. This credit has been removed from the tool, with the requirements included as an additional point in IEQ-5 'Thermal Comfort'. Such additional point is only applicable to the non-industrial spaces. It becomes 'Not Applicable' where the non-industrial space is smaller than 2.5% of the GFA up to 500m², or where the only existing spaces are all industrial areas.

IEQ-16 'Exhaust Riser'

No feedback was received on this credit.

IEQ-17 'Air Distribution System'

No feedback was received on this credit.

IEQ-18 'Outdoor Pollutant Source Control'

No feedback was received on this credit.

IEQ-19 'Breakout Spaces'

It was suggested that breakout spaces do not need to be naturally ventilated (11)(6)(14)

GBCA Response: Agreed, the requirement has been removed

It was suggested that the requirements for a distance from noise and air pollution cannot be achieved, and are unrealistic. (11)

GBCA Response: Agreed, performance criteria have replaced distance requirements.

It was suggested that breakout spaces should be rewarded better within the tool (11)

GBCA Response: The available points reflect the consensus from the Technical Working Group. Should a project believe that more points should be awarded based on the size, and benefits, produced by a particular design, such a space can be rewarded an innovation point. Two points are now awarded in this credit.

It was suggested that Industrial spaces are not always occupied in proportion to the area of the facility. It is recommended that the size of the breakout space be in accordance with occupancy as well. (14)

GBCA Response: Agreed. The area required for a breakout space can be calculated based on area or occupancy.

Energy

General Energy feedback

It was suggested that a separate, additional credit for renewable energy is appropriate; that this would be in keeping with the national focus on renewable energy and would be a good driver for change. (11)

GBCA Response: The greenhouse gas emissions savings that result from the installation of renewable energy systems are rewarded in Ene-1. The overarching aim of the Energy Category is to reward projects which increase their energy efficiency and reduce their greenhouse gas emissions. Where it is possible to model the energy and greenhouse gas emissions savings from a particular technology/energy efficiency design initiative, guidance on doing so is included in the Ene-1: Greenhouse Gas Emissions modelling guide; and no separate credit is included in the tool. In this way, the relative benefits of different technologies/energy efficiency design initiatives are rewarded appropriately. The GBCA does not reward renewable energy systems over energy efficient design solutions which deliver the same reduction in greenhouse gas emissions.

Ene-con Conditional Requirement

It was suggested that the greenhouse gas coefficients used in the Green Star – Industrial PILOT Energy Calculator were not consistent with Australian Greenhouse Office (AGO) figures. (11)

GBCA Response: The greenhouse gas coefficients (or emissions factors) used in the Green Star – Industrial PILOT tool were consistent with the AGO figures at the time of release of the PILOT tool. The emissions factors used in all Green Star tools come from the “National Greenhouse Accounts (NGA) Factors” document, published by the Department of Climate Change. This document is revised and updated regularly (roughly every six months), to take into account any new research and also changes in the fuel mix for electricity production in each of the States and Territories. At present, the emissions factors in the Green Star tools are not modified after the release of a tool so that design teams are not faced with changing benchmarks.

The emissions factors used in the Green Star – Industrial v1 Greenhouse Gas Emissions calculator (the new name for the Energy Calculator) will be those from the NGA Factors document current at the time of release of the tool.

Ene-1 ‘Greenhouse Gas Emissions’

It was suggested that the common area lighting profiles should track occupancy levels. The current lighting benchmarks result in points being difficult to achieve for many projects, more so with industrial buildings, due to activities that occur within the building. (3)

GBCA Response: The same lighting profiles must be used for the Proposed Building and the Standard Practice Benchmark Building. The same lighting profiles are required to be used, as Green Star rewards building attributes and not operational energy saving measures. This does not disadvantage industrial buildings over any other building type.

It was suggested that climate types were too varied across the states which have a larger area (e.g. Qld vs Victoria) and that such states should not have state allocated benchmarks. It was suggested that the energy benchmarks should not be state based, but be climatically based such as in the BCA and NABERS. (6)

GBCA Response: The Green Star – Industrial PILOT did not have ‘state allocated’ greenhouse gas emissions benchmarks - the same benchmark was applicable regardless of state or climate.

The new greenhouse gas emissions calculation methodology, however, does consider variations in climate. The climate zones used are those in the Building Code of Australia (BCA). The Standard Practice Benchmark for greenhouse gas emissions is established by modelling the energy consumption of the Standard Practice Building, which is predominantly based on the *deemed-to-satisfy* provisions in the BCA Section J. Where the *deemed-to-satisfy* provisions vary by climate zone, so do the attributes of the Standard Practice Building. This means that the Standard Practice Benchmark building will be appropriate for the project’s location.

In addition to this, the greenhouse gas emissions from the Standard Practice Building are calculated using the same state based emissions factors as the Proposed Building, instead of an Australian average emissions factor, as was the case in the PILOT tool. This change means that projects are not penalised for the carbon intensity of their electricity supply. However, the benefits of installing renewable/low carbon electricity generation on site and for switching to gas/biofuel or other will still be appropriately rewarded.

Ene-2 ‘Energy Sub-metering’

No feedback was received on this credit.

Ene-3 ‘Peak Energy Demand Reduction’

It was suggested that planned and calculated BMS controlled load lopping through staggered starting up of AC equipment (major load time) should be allowed as a route to comply with this credit. (6)

GBCA Response: The use of load lopping by the BMS (or equivalent) is an operational measure to reduce peak energy demand, not a building attribute. While there may be an operational benefit in such strategy with regards to reducing peak energy demand, load lopping/shedding strategies can lead to reduced indoor environment quality, and usually relate to aspects of energy use that could be better managed.

Feedback was received that it was unrealistic to require that ‘the demand on infrastructure will never exceed the established threshold.’ It was suggested that on a rare occasion, there might be critical maintenance, or a fault on the demand reducing equipment (such as cogen or PV) which could occur during the peak period. If this were to occur, then it would affect the building’s demand as it would increase for a short period. (15)

GBCA Response: The sentence within the Compliance Requirements section of this credit has been revised following this feedback. The requirement now reads as follows:

‘The Certified Assessor(s) will not award points unless...It has been clearly demonstrated that the demand on the infrastructure will not exceed the established threshold under normal operating conditions (i.e. excluding occasions where there may be critical maintenance or a fault on the demand reducing equipment)’

It was suggested that excluding process load from the peak energy demand calculations might not be the right thing to do for industrial buildings. The following question was asked: ‘How will this credit work for industrial sites where there is an owner occupier, where the on site processes are much more energy intensive than the base building loads? The client would no doubt want to make a reduction on the entire building loads, including light and power. Quite often, industrial sites will not be split base and tenant.’ (15)

GBCA Response: Green Star - Industrial v1 is a base building tool, hence process loads are not required to be taken into account. The full capacity of an active system/passive design initiative can be used to show the reduction on peak electricity demand from the building’s electricity uses which are included in this credit (all but process loads and small power).

Ene-4 ‘Lighting Zoning’

It was suggested that a maximum zone size of 500m² was unrealistic for large warehouse spaces. For a 30,000m² warehouse this would equate to 60 zones. It was suggested that this was unreasonable for the operation of a warehouse space. (11)

GBCA Response: This credit has been removed, with all guidance and potential benefits have been allocated to the Greenhouse Gas Emissions Calculator.

Ene-5 'Lighting Power Density'

Not applicable to this tool.

Ene-6 'Car Park Ventilation'

Feedback was received that this credit was not relevant for the majority of industrial developments. (11)

GBCA Response: **This credit has been removed.** The benefits from naturally ventilating car park spaces, providing passive supply/exhaust and/or for installing CO monitoring with variable speed drive fans, is now rewarded in Ene-1: Greenhouse Gas Emissions. The energy and greenhouse gas emissions savings resulting from these initiatives are now appropriately and proportionally rewarded in the tool.

Ene-7 'Unoccupied Spaces'

Not applicable to this tool.

Ene-8 'Stairs'

Not applicable to this tool.

Ene-9 'Efficient External Lighting'

Not applicable to this tool.

Ene-10 'Precinct Energy Systems'

Several pieces of feedback were received regarding Ene-10: Precinct Energy Systems:

1. *Why is it required for the system to supply 50% of the total energy to the base building? This would be very difficult considering plant such as cogen would only run during day (as it is only feasible to run during peak/shoulder part of day), and not off-peak. Being an industrial tool, it is quite likely many of the industrial projects will not be split base and tenant. Also, a company such as a news paper printing facility will have much greater energy usage off-peak than in peak. It is proposed that it specifies 50% of total energy during peak/shoulder part of the day. (15)*
2. *Regarding the requirement for buildings to be less than 200m apart: 200m seems to be a lot since it will be infeasible where multiple buildings are 200m apart due to the cost of reticulation. Electrically speaking, if buildings are apart 200m it is quite likely the precinct is supplied from multiple stations (quite likely on large industrial dispersed precincts. Where this is the case, it is highly likely that the decentralised plant cannot be connected in parallel with both substations due to regulations set by the networks. The figure should be more like 100m. (15)*
3. *The credit requires that the project is served by a central energy system that provides reticulated services from a plant room shared by at least three buildings. How would an on-site renewable energy generation system that feeds into the precinct mains power be treated under the credit? (6)*

GBCA Response: **This credit has been removed.** Where the installation of a shared/precinct wide energy system results greenhouse gas emissions savings for the building, these savings will be rewarded Ene-1: Greenhouse Gas Emissions. In response to the feedback above:

1. In Ene-1: Greenhouse Gas Emissions, there is no requirement for a particular system to provide a particular percentage of base building power in order for that system to be included in the model;
2. In Ene-1: Greenhouse Gas Emissions, there is no requirement for buildings to be a certain distance apart for a particular system to be included; and
3. The design team is required to follow the modelling guidance in Green Star – Industrial v1 Greenhouse Gas Emission calculator guide for shared energy systems.

If the project team believes that a particular shared energy system results in reduced environmental impacts which are not rewarded in Ene-1: Greenhouse Gas Emissions, or anywhere else in the Green Star - Industrial v1 tool, they should apply for Innovation Points. Guidance on the type of information required for an application for innovation points for a shared energy system is included in the Green Star – Industrial v1 Greenhouse Gas Emissions Guide.

Ene-11 'Energy Efficient Appliances'

Not applicable to this tool.

Transport

Tra-1 'Provision of Car Parking'

It was suggested that as it is often difficult for staff to access work via public transport; car parking is usually allowed for all staff. This is especially relevant for shift change-over times where car parking is required for double staff for that 20min period. Therefore, providing minimum car parks does not cater for operational or staff requirements (14).

GBCA Response: The Credit criteria are based on the allowances for car parking given from the local planning authority. Points are awarded for not providing more spaces than the local planning allowance. Local planning allowances generally allow more car parking where the demand is higher. The concern highlighted here should be addressed under the local planning allowance.

Tra-2 'Fuel-Efficient Transport'

It was suggested that hybrid cars or other alternative fuel vehicles should be removed as a mean to meet the credit criteria. There appears to be no scientific backing to this. Hybrid cars include Lexus 4.5L 4-Wheel Drives, Alternative fuels could be anything (not necessary better) as e.g. in the case where bio-fuel is generated at the same embodied energy as petrol and destroys food crops in the process, etc. (7).

GBCA Response: The reference to hybrid and other alternative fuel vehicles has been removed from the credit criteria, as it is not clear that these vehicles always have lower environmental impact than other vehicles.

Tra-3 'Cyclist Facilities'

It was suggested that the additional point is irrelevant to industrial facilities. "Visitors" to these types of facilities tend to be sales reps and other visitors coming from long distances away where cycling will not be a viable option. (11)

GBCA Response: Agreed, the requirement for visitor bicycle facilities has been modified, so that five bicycle parking facilities are required regardless of size or occupancy. Bicycle parking for visitors provide an added convenience to for example for deliveries or transport within precincts.

It was suggested that it is common that the same staff occupy the "warehouse" area and the "offices". Therefore, they should be accounted for only once in calculating the number of bike spaces/lockers/showers to provide. (21)

GBCA Response: The credit has been amended so that the actual occupancy number, if it is known, can be used to calculate the required number of bicycle facilities. If the occupancy is unknown, standard occupancy should be used.

Tra-4 'Commuting Mass-Transport'

It was suggested that industrial buildings often operate outside of peak commuter times, and due to their nature are not usually located near central city transport hubs. Therefore, achieving this credit is extremely difficult, especially when shift work applies. Many of these types of operations work 7am-4pm, which is a 2hr offset from most public transport peak operating hours. So, while public transport is available it is not at the frequency, and often not at the distances for which the calculator has been designed. (8&14)

GBCA Response: The peak periods in the Commuting Mass Transport Calculator have not been changed. The assessment in the Commuting Mass Transport Calculator is done during peak periods

to determine the overall frequency of the transport services, the service frequency during peak periods is generally representative of the overall frequency. Determining a variation to the peak periods is complicated by the eligibility criteria for Green Star – Industrial v1, which allows for a significant part of the building to include office facilities, and the fact that Industrial facilities may be used in a number of different ways, including 24 hour operation, long 2-shift days and normal working hours, etc. Please refer to the Commuting Mass Transport Calculator Guide Appendix A for details of how the benchmark varies based on the population density of the location of the building.

It was suggested that Transport for operation (e.g. cargo and deliveries) has a much higher environmental impact than transporting of staff to and from the industrial sites. (11)

GBCA Response: The environmental impact from transport of cargo depends on the type of industrial process in the building; hence the suggestion may not be true for all industrial facilities. The Green Star – Industrial v1 assess the environmental attributes of the base building not the industrial process.

It was suggested that all the Central Melbourne loop stations should be added to the list of stations in Victoria (Flagstaff, Melbourne Central, Parliament, Flinders Street & Southern Cross) as there may be projects that fall outside the 500m deemed to satisfy postal code criteria but will still get 5 points due to the transport links. This will substantially help many projects in Docklands. (13)

GBCA Response: The GBCA is continuously developing new deemed to satisfy mechanisms in the tools, additional locations that are deemed to satisfy will be added when a number of projects within the same location have been assessed. The stations in the feedback will be reviewed as part of the continuous review of the Commuting Mass Transport Calculator.

Tra-5 'Trip Reduction – Mixed Use'

It was suggested that the number of amenities and distance to the amenities required is totally unrealistic for industrial facilities. The intent of the credit is worthwhile, the application is unrealistic. (11)

It was suggested that The distance threshold of 400m isn't practical. For this industrial estate precinct, average frontages are 200m. We believe that having 5 amenities within 400m of the lot is going to prove difficult to comply with, and 10 will be impossible.

It is suggested that the distance for amenities is increased from 400m to 1km - which is the distance threshold for public transport. It is also suggested that the number of amenities for 1 point is decreased to 2, and for 2 points is decreased to 5.

The aim of the credit is to reduce the number of car trips taken by employees. The most common activities in breaks are to purchase lunch and perhaps run a small errand. The alternative suggestion will still meet this aim, but be much more practical to achieve.

This would mean that projects in industrial precincts that are near, or feature a small commercial corner would feature lots eligible for 2 points, and those where the precinct developer provides facilities scattered throughout a development would feature lots eligible for the 1 point. (8)

GBCA Response: The credit has been amended to include the suggestion to reduce the benchmarks to 1 point for 2 amenities within 1000m and 2 points for 5 amenities within 1000m. Refer to the Technical Manual for details about the changes to this credit.

Tra-6 'Transport Design and Planning'

Not Applicable to this tool.

Tra-7 'Proximity to Major Cargo Transport Service'

It was suggested that the requirements in this credit prevents practically all industrial developments from achieving any points. For example in Brisbane, while the sea and air freight services are close together, the rail freight service is located 35km (approx) from these, making it impossible to achieve 2 points in South Eastern Queensland. It is also noted that many non-capital cities do not even have the option to be near 2 let alone 3 of these freight services.

Perhaps points should be awarded based on the type of freight required and their proximity to that instead. (14)

GBCA Response: This credit has been removed from the rating tool.

The environmental benefit of the credit was unclear and the proposed credit was very linked to the industrial activity in the building, e.g. if the industrial activity that was to take place in the building required rail cargo transport, a site will be chosen with rail cargo transport facility. This reliance on operational issues was deemed to be beyond the base building scope of this rating tool.

Water

Wat-1 'Occupant Amenity Water'

It was suggested that Industries have different demands on number of occupants per area (m²), specifically on the manufacturing/process area. A winery we've been working on, the calculator assumed 254 occupants when in fact we will have an average of 20 (5 staff). With that I'll never achieved any points on this issue. (2)

GBCA Response: The calculator has been amended so that Maximum Design Occupancy can be entered manually, if it is known. If the occupancy is unknown; default Maximum design occupancy will be used.

It was suggested that a new credit should be created that awards the provision of Grade A (non-mains) water for tenancy requirements such as process water. Industrial facilities provide great opportunities for water recycling but occupant amenity water use is insignificant compared to process water.

It was suggested that external sourced treated water can be used in place of water collected on site to ensure a continual non-potable water supply for the precinct to be used for all toilet flushing and irrigation. (8)

GBCA Response: The Calculator has been amended so that recycled water treated to appropriate levels can be used as a reused water source; a new data entry option has been added to the calculator. The rating tool excludes consideration of process issues. The consideration of non potable water for tenant process activities is beyond the scope of this rating tool.

Wat-2 'Water Meters'

No feedback received

Wat-3 'Landscape Irrigation'

No feedback received

Wat-4 'Heat Rejection Water'

No feedback received

Wat-5 'Fire System Water Consumption'

It was suggested that there should be a reward for supply of precinct wide recycled water for fire system testing. (14)

GBCA Response: Shared systems can be used to meet the credit criteria, no change to the credit required.

It was suggested that projects without sprinklers should be rewarded somehow because water use is much lower than a building with sprinklers. (8)

GBCA Response: The requirements for installing sprinkler systems are generally stipulated by building regulations rather than a design decision. The points are awarded if the fire system does not expel water for testing .

Wat-6-8 Not applicable to this tool

Materials

Mat-1 'Recycling Waste Storage'

No feedback received

Mat-2 'Building Reuse'

No feedback received

Mat-3 'Recycled Content & Re-used Products & Materials'

Based on discussions with Bluescope Steel all new steel has a recycled content of 15-20%. Structural Steel comprises approximately 20% of the base building cost therefore all projects will qualify for at least one point. (11)

GBCA Response: the credit includes product with recycled content of over 50%, as such the example given does not represent reward under the credit.

Mat-4 'Shell and Core or Integrated Fitout'

Not applicable to this tool

Mat-5 'Concrete'

It was suggested that engineers are refusing to certify structures for the %reused material in concrete asked for in credit - claiming issues with structural integrity. Reasoning - industrial buildings are not reinforced as well as commercial buildings due to large open design requirements (14)

GBCA Response: This credit is under Expert Reference panel review, the comments made here are addressed as part of this process.

Mat-6 'Steel'

The value given to Mat-5 in the Industrial Pilot is disproportionate to that given to Mat 9 - given the current conditions for re-cycling and the opportunities for affecting future behaviours and environmental benefits. We believe that it is questionable whether Mat 5 is useful at all given the current economic value of scrap steel and existing level of recycling. (12)

GBCA Response: The revised Steel credit addresses these comment and is included in the Green Star - Industrial v1 rating tool.

It was suggested that targeting one point for industrial warehouses, to take 60% of the project steel, and then ensure that it has a post consumer recycled content greater than 50% is difficult. This is because to maintain the structural integrity required for large spans without concrete reinforcement, the appropriately graded products are unavailable with a minimum 50% post consumer recycled content. (8)

GBCA Response: The revised Steel credit addresses these comment and is included in the Green Star - Industrial v1 rating tool.

Mat-7 'PVC Minimisation'

No comments received

Mat-8 'Sustainable Timber'

No comments received

Mat-9 'Design for Disassembly'

Not applicable to this tool

Mat-10 'Dematerialisation'

In a situation where the office is 5% of GFA and no floor coverings are used in the office, can the credit then be claimed although the dematerialisation benefit is limited (14)?

GBCA Response: Yes, however one more initiative from the list of initiatives must be claimed to achieve the available point. Note that this section of the credit is not applicable for projects with occupied spaces less than 2.5% of the GFA, or, less than 500m² (whichever is smaller).

Mat-11-15 Not applicable to this tool

Land Use & Ecology

Eco-conditional Requirement

It was suggested that reclaiming wetlands is a popular method that councils use to make land available to create industrial estates, and that the Eco Conditional Requirement in the Industrial tool should make some consideration of this. (14)

GBCA Response: Reclaiming wetlands for the purposes of development is generally considered to be a poor environmental outcome. Conversely, the work of professionals in the field of wetland conservation, restoration and management shows that there are significant benefits to preserving and/or restoring them. On this basis the Eco Conditional Requirement generally makes a project ineligible to achieve a Green Star rating, if the developer has chosen to reclaim a wetland for the purposes of the development. It is acknowledged however, that there are rare circumstances in which reclaiming a wetland may provide an overall environmental benefit. Please note that the Eco Conditional Requirement was revised in 2008 to allow developments within 100m of wetlands to achieve a Green Star rating under certain conditions.

Eco-1 'Topsoil'

No feedback received.

Eco-2 'Reuse of Land'

It was suggested that the credit should be expanded to reward the reuse of other types of land such as: Brickpits, quarries, mines, rubbish dumps, etc. (11)

GBCA Response: Agreed. The definition of 'previously developed land' used in the credit now includes brickpits, quarries, mines and landfills.

It was suggested that due to the size of land required for industrial developments, often it is not possible to obtain the land size required from an existing built site to account for 75%. Most new sites purchased for industrial developments are on previously unbuilt sites. This credit is biased to building refurbishment or extension projects. (14)

GBCA Response: The aim of this credit is to encourage and recognise the reuse of land that has previously been developed. This is due to the fact that reusing an existing site is generally a better environmental outcome than developing a new greenfield site. There are three routes to compliance with this credit. 1. The project is a refurbishment. 2. The project is a building extension. 3. The site is a brownfield site. Additionally, the definition of 'previously developed land' used in the credit has been expanded to include brickpits, quarries, mines and landfills.

It is acknowledged that some credits in the Green Star – Industrial tool will be harder for certain types of projects to achieve than others. However, it is not mandatory to achieve this credit, and it is important for Green Star to formulate credits on the basis of environmental impact, rather than on ease of achievement.

Eco-3 'Reclaimed Contaminated Land'

No feedback received.

Eco-4 'Change of Ecological Value'

It was suggested this is a credit which will be difficult to obtain, as often vast areas of concrete are required to allow for the access and loading requirements of large trucks to provide freight transport. Consequently, much of the area is non-permeable hardstand and very little is available for landscaping.

GBCA Response: It is acknowledged that some credits in the Green Star – Industrial tool will be harder for certain types of projects to achieve than others. However, it is not mandatory to achieve

this credit, and it is important for Green Star to formulate credits on the basis of environmental impact, rather than on ease of achievement. In some circumstances the large areas of land being used by industrial developments could be used more efficiently, and thereby create more extra space for ecological improvements than are achievable on higher density types of developments, e.g. Office sites in the CDB.

The change of ecological value calculator has been reviewed, and the ecological weightings changed to make attaining points more achievable than in the PILOT version of the tool. Green roofs been added to the list of ecological land types for which points are awarded, and they have been weighted highly to encourage uptake. Green roofs are an achievable means of gaining points for industrial projects which often have large roof areas.

Emissions

Emi-1 'Refrigerant ODP'

No feedback received.

Emi-2 'Refrigerant GWP'

It was suggested that the National Greenhouse accounting only lists CO₂ and ammonia as meeting this requirement. (14)

GBCA Response: Refrigerants with a GWP100 of 10 or less include: water (with or without salt(s) or anti-freeze); carbon dioxide; ammonia; and hydrocarbon. It is the intention of the credit to encourage the use of natural refrigerants and other refrigerants that have a low GWP. Most synthetic refrigerants have a high GWP that, in the event of a refrigerant leak, lead to an adverse environmental outcome. One of the aims of Green Star is to encourage the development of products that can achieve a good environmental outcome by stimulating market demand. Where it is the case that currently available products cannot meet the credit criteria, it is hoped that this market demand will lead to the development of new products that can.

Emi-3 'Refrigerant Leaks'

It was suggested that in some industrial developments, split system units will be the only type installed, and therefore will contain 100% of the refrigerants on site. These refrigerants might not comply with both Emi-1 and Emi-2 and therefore would not be able to be excluded from the credit criteria. (14)

GBCA Response: In response to stakeholder feedback and input from the TWG, this credit has been significantly revised. Refrigeration machinery addressed by this credit now excludes small packaged units with a cooling capacity of less than 50kW each. It is the intention of this credit to address the potential environmental impact from a refrigerant leak from larger split system units. Excluding them from the credit would potentially reward projects for installing systems that could allow refrigerants with ozone depleting potential, or a high global warming potential, to escape into the atmosphere.

Emi-4 'Insulant ODP'

No feedback received.

Emi-5 'Watercourse Pollution'

It was suggested that the tool should allow developments to use a precinct wide swale system, to address the criteria for this credit. (14)

GBCA Response: In response to stakeholder feedback and comments from the Technical Working Group, this credit has been revised, and new credit criteria have been developed. The new criteria however, also require on-site treatment or reuse of stormwater. The reason for this is that there is a significant environmental benefit to on-site treatment. Amongst other things, it reduces the load on precinct wide treatment systems, and in turn usually reduces the amount of pollutants flowing into water courses and wetlands. It is also very difficult in most cases, to determine the ability of a precinct wide treatment system to achieve the pollution reduction targets required by the credit criteria.

In the event that a precinct wide treatment system is meeting the aim of the credit, a Credit Interpretation Request (CIR) can be submitted to the GBCA. The information provided in the CIR will be assessed to determine whether or not the aim of the credit is being met, and whether or not sufficient evidence of compliance is being provided. Through this method, it is possible that a good precinct wide treatment system could be used to achieve compliance with this credit.

Emi-6 'Discharge to Sewer'

No feedback received.

Emi-7 'Light Pollution'

No feedback received.

Emi-8 'Legionella'

No feedback received.

Emi-9 'Trade Waste Pollution'

Not applicable to this tool.

Emi-10 'Airborne Emissions'

Not applicable to this tool.

Emi-11 'Noise Pollution'

It was suggested that the criteria would be difficult to achieve for industrial developments, as generally they are rather noisy and noise is not always contained within buildings/structures where noise mitigation measures can be taken. (14)

GBCA Response: In response to stakeholder feedback and comments from the Technical Working Group, this credit has been revised, and new credit criteria have been developed. When developing the benchmarks for this credit, consideration was taken of the fact that industrial processes can be loud, and of the fact that industrial noise may occur outside of a building.

It is acknowledged that some credits in the Green Star – Industrial tool will be harder for certain types of projects to achieve than others. However, it is not mandatory to achieve this credit, and it is important for Green Star to formulate credits on the basis of environmental impact, rather than on ease of achievement.

It was suggested that the definition of "standard noise" is not clear - this will be highly dependent on the final building activity which is not always known for a building at the design stage, especially for industrial developments. (14)

It was suggested that the credit criteria do not make sense for the base building, as noise levels can only be calculated when the building use is taken into account. (11)

GBCA Response: In response to stakeholder feedback and comments from the Technical Working Group, this credit has been revised, and new credit criteria have been developed. The reference to noise whilst in "standard operation" has been removed. The credit now requires noise estimates/measurements from all significant noise sources to be balanced against the background noise level.

It is usual for an industrial development to be designed with an end use in mind. As part of an industrial development's DA process, a noise impact assessment is often undertaken using estimated noise levels from significant noise sources. Where estimated noise levels are required for compliance with this credit (Eg. for a design rating) it is acceptable to use the levels relied upon in a noise impact assessment undertaken as part of the project's DA.

With regard to predicting noise levels for sites which are not yet operational, it is very common for acoustics professionals to use previously measured noise levels for equipment as an input to a sound propagation methodology (such as ISO9613 or Concawe) to predict noise levels at noise sensitive receivers. For speculative developments where it is impossible to estimate the noise

contribution from the end use, the credit has default values that can be used in place of estimated/measured noise levels.

Innovation

Inn-1 'Innovative Strategies and Technologies'

No feedback received.

Inn-2 'Exceeding Green Star Benchmarks'

No feedback received.

Inn-3 'Environmental Design Initiatives'

No feedback received.