greenstar

GREEN STAR –
MATERIAL CALCULATORS 2.0 BACKGROUND AND OUTCOMES

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CHANGE LOG

Tool Version	Revision	Date Issued	Description
Green Star - Material Calculators 2.0 Backgrounds and Outcomes	A	October 2010	Issued for public comment

1.0 EXECUTIVE SUMMARY

This document provides background information on how and why the Material Calculators 2.0 were created. Material calculators are used to evaluate a project's use of materials for interior fitouts. They are designed to encourage product choices that are better for the environment. A material calculator is completed as part of the documentation for some Green Star rating tools.

Over the past five years, material calculators have formed part of several Green Star rating tools. They have been effective in stimulating demand for environmentally preferable fitout products and materials. The calculators have also influenced positive change in industries that manufacture and supply fitout products and materials.

Changes to the current material calculators have been recommended via feedback from users of the material calculators, experts and industry organisations. The following outcomes have been requested:

- **Churn reduction** – provide greater effectiveness in reducing environmental impacts caused by the typical short life span of interior fitouts.
- **Interpretation of compliance requirements** – provide clear and definitive interpretation of compliance requirements for users.
- **Documentation requirements** – provide clear explanations of documentation requirements for users of the material calculators.
- **Commercial decisions by manufacturers and suppliers** – reduce compliance costs for product suppliers and manufacturers.
- **Durability measurement** – provide a more meaningful measure of durability than the current use of warranties.
- **Product certification** – recognise different levels of performance in certified products.
- **Environmental management systems** – require only ISO 14001 certified EMS which address the environmental impacts relevant to materials used for interior fitouts.

The Material Calculators 2.0 are adapted from the current material calculators. They aim to improve and simplify the assessment of fitout products and materials as part of Green Star assessments.

Replacing the current material calculators with the Material Calculators 2.0 will address the concerns of stakeholders, product suppliers and users. Introducing the new calculators will have very little impact on compliance benchmarks affecting Green Star project teams, product manufacturers and suppliers.

The new Material Calculators 2.0 are not based on life cycle assessment comparisons of products and materials. However, the Green Building Council of Australia is investigating the possibility of using a life cycle material assessment. The current status of this investigation is described in Section 7.

2.0 INTRODUCTION

This document explains the purpose of the proposed new material calculators, their development and characteristics. This revised set of material calculators is called the 'Material Calculators 2.0'. The first material calculator was introduced in 2005 as part of Green Star – Office Interiors v1. Since then, several material calculators have been used as part of other Green Star rating tools. Over the years, the Green Building Council of Australia has used feedback about the material calculators to inform continuous improvement of the Green Star rating tools. The Material Calculators 2.0 have been created in response to users' comments and recommendations.

The general purpose of all material calculators is explained in Section 3. Issues raised by stakeholder feedback are summarised in Section 4. The Green Building Council of Australia has considered this feedback and created a short list of proposed aims for the new Material Calculators 2.0. These aims are described in Section 5 , while Section 6 describes the way the Material Calculators 2.0 address these aims.

In the future, the aims of the material calculators may be met by life cycle assessment. Currently, this type of assessment cannot be applied in Green Star. Information about the Green Building Council of Australia's investigation of life cycle assessment is presented in Section 7.

3.0 PURPOSE

REDUCE CONSUMPTION OF MATERIALS

The 'Materials' category in Green Star rating tools aims to reduce consumption of resources. Solutions focus on the following measures:

- product selection
- product use
- re-use of products
- efficient management practices.

FOCUS ON INTERIOR FITOUTS

Research by the Royal Melbourne Institute of Technology Centre for Design shows that materials used for interior fitouts have a significant environmental impact:
Materials used in building projects generate 30 to 40 per cent of Australia's demand for minerals and production of solid waste. This is caused in part by building construction and refurbishments. It is also caused by the operation and demolition of buildings (CfD et al., 2006).

FOCUS ON CONSUMPTION CAUSED BY CHURN

Research shows that a typical interior fitout will be replaced more quickly than any other part of a building. This fast 'churn' rate increases the waste and consumption caused by interior fitouts in general:
A large proportion of the use and waste of resources results from the cycle of refurbishments. This includes items such as furniture, assemblies and flooring (Terry et al., 2007). For example, in a typical office fitout, a wool and nylon mix carpet with foam underlay will be replaced every five years over a typical 60-year life of a building. This accounts for around 40 per cent of the building's total environmental impact. This is similar to the typical environmental impact of all floors, substructure, roof, walls and glazing combined, for the life of the building (BRE, 2008). Selecting an environmentally preferable floor covering can therefore have a significant environmental benefit.

TWO KEY AIMS

All material calculators have two main aims:

1. Encourage use of environmentally preferable materials and products for interior fitouts.
2. Reduce consumption and waste of materials caused by frequent replacement of interior fitouts.

TARGET ITEMS

The current material calculators and the Material Calculators 2.0 target particular item types for interior fitouts. Research shows that these item types represent the bulk of material flows associated with interior fitouts:

- furniture
- ceilings, internal walls and partitions
- joinery items
- flooring (CfD et al., 2006).

4.0 FEEDBACK

The Green Building Council of Australia collected feedback on Green Star rating tools in order to improve them. Since 2005, the following groups have provided feedback about the material calculators:

- Green Star project teams
- manufacturers and suppliers of fitout products
- product certification schemes
- the 'Product Certification Project Expert Reference Panel'
- technical working groups for the development of Green Star rating tools.

This section summarises feedback from all these groups.

STRENGTHS

The current material calculators have stimulated demand for environmentally preferable fitout items. Further, their introduction has changed unfavourable manufacturer and supplier behaviour. The new Material Calculators 2.0 should continue to drive these positive environmental outcomes.

WEAKNESSES

Addressing the churn rate of fitouts
Material calculators aim to reduce consumption and waste of interior fitout materials. This consumption and waste is mainly caused by the high churn rate of interior fitouts. The material calculators could be more effective in addressing churn rate.

Durability measurement
Using a 'Durability' criterion, the current material calculators reward products that come with a warranty. Stakeholders have indicated that, in the case of interior fitouts, a warranty is unlikely to prevent a product from being replaced. Therefore, rewarding product durability alone is not an effective way to achieve the aims of the material calculators.

Product certification
Stakeholders have questioned the fairness of a product certification criterion which only rewards one product certification scheme. In response, several more product certification standards have been recognised under the Green Building Council of Australia's Assessment Framework for Product Certification Schemes.

The current material calculators reward all Green Building Council of Australia-recognised certification standards equally. Some stakeholders would prefer that relatively stringent standards are rewarded more highly by the Green Building Council of Australia.

Environmental management systems
An environmental management system (EMS) signifies a product supplier's commitment to practices that reduce their organisation's environmental impact. Some feedback indicates that stakeholders feel an EMS does not meet the aims of the material calculators. They believe that, for an EMS to be rewarded in the calculators, it should a) be certified, and b) address relevant environmental loads.

Interpretation of compliance requirements
Many of the documentation requirements for the current material calculators are unclear and open to interpretation. For example, 'modularity', 'design for disassembly' and 'durability attributes of a product' (which are rewarded in the current material calculators) may be argued or documented in a variety of ways and applied to a wide range of products. This lack of clarity makes it difficult to determine whether or not a product is compliant. As a result of this uncertainty, Green Star project teams are reluctant to attempt compliance with these criteria.

Commercial decisions by manufacturers and suppliers
Manufacturers and suppliers who promote a fitout product that complies with the material calculator criteria may face high costs when generating evidence for compliance. Another concern is the complexity of the evidence they are required to submit.

5.0 AIMS OF REVISION

The material calculators must be revised as part of the ongoing development and improvement process of Green Star rating tools. Considering this requirement – and the feedback described above – the following aims have been established for the Material Calculators 2.0:

- **Common framework for assessment** – provide a more uniform assessment method for all fitout items addressed by material calculators.
- **Environmentally preferable products and materials** – continue to encourage the use of environmentally preferable products and materials.
- **Consumption and waste caused by churn** – improve effectiveness in addressing this type of consumption and waste.
- **Documentation required** –
  - Provide clear compliance and documentation requirements.
  - Simplify documentation requirements for a variety of criteria.
- **Benchmarks and points** – re-evaluate the benchmarks and points awarded, in response to a changing industry.

This section explains the furniture, assemblies and flooring calculators. Definitions and examples are provided. The steps required to complete the calculators are also described:

- Step 1: entering the total items in the project.
- Step 2: entering a description of the item's type and the name of the supplier.
- Step 3: entering the total number of items of that type.

Section 4 explains the fourth step, which involves entering a response to one or more of the five criteria.

6.0 OUTCOMES

The Material Calculators 2.0 address stakeholder feedback. This section explains how the aims of this revision have been met.

COMMON FRAMEWORK FOR ASSESSMENT

Material calculators will be easier to use if they share a common framework to assess various fitout items. The current material calculators use a selection of up to 12 different criteria. The criteria used vary between credits.

The Material Calculators 2.0 cover the most relevant types of fitout items. These are:

- furniture
- ceilings
- internal walls and partitions
- joinery items
- flooring.

These item types have been divided into three categories of material calculator:

1. Furniture Calculators
2. Assemblies Calculators – including joinery, internal walls and partitions
3. Flooring Calculators.

All three Material Calculators 2.0 assess product selection using a common framework of five criteria:

1. Re-use of products and materials
2. Use of product stewardship agreements
3. Use of products approved by relevant certification schemes
4. Use of items with re-used, recycled or certified content
5. Use of items produced by organisations with an ISO 14001 certified environmental management system.

ENVIRONMENTALLY PREFERABLE ITEMS

Material Calculators 2.0 encourage use of environmentally preferable materials and products for interior fitouts.

Criterion 3: Certified products
Selecting certified products contributes to improved environmental outcomes relating to a variety of impacts, such as greenhouse gas emissions, toxicity, water use and material consumption.

The material calculators reward project teams for selecting certified products. The Green Building Council of Australia recognises product certification standards that comply with an assessment framework. All of these standards report on relevant elements of a product's environmental impact. Since 2009, several standards have been added to the list of Green Building Council of Australia-recognised certification schemes.

More information about Green Building Council of Australia-recognised product certification schemes is on the Green Building Council of Australia's website www.gbca.org.au.

Criterion 4: Re-used, recycled or certified content
The material calculators reward selection of components and material content with the following environmentally preferable characteristics, this is similar to the previous calculator 'Eco Preferred Content' criteria:

- re-used components
- recycled content
- components certified by a Green Building Council of Australia-recognised product certification standard
- timber content or components with 'chain of custody' certification from a PEFC or FSC 'forest certification scheme'

Each of these characteristics bring important benefits:

- Re-using components and using recycled content prevents wastage and reduces demand for new materials.
- Selecting certified products improves environmental outcomes relating to a variety of environmental impacts.
- Using 'chain of custody' certified timber guarantees that procuring the timber has caused minimal environmental impact.

Criterion 4 continues to reward materials and content displaying these characteristics. The new calculator format highlights the importance of these benefits by naming each one.

Criterion 5: Environmental management systems
The material calculators recognise products supplied by organisations with various types of environmental management systems. This does not ensure that environmental impact related to production of fitout items will be addressed.

Criterion 5 of the Material Calculators 2.0 only rewards organisations for:

- using an EMS that is certified to the ISO 14001:2004 international standard
- implementing an EMS that deals with impacts relevant to fitout items. These are defined by the Material Calculators 2.0 as the four 'aspects': Energy, Waste, Water and Material Consumption.

The implementation of an EMS in accordance with Criterion 5 of the Material Calculators 2.0 guarantees that environmental performance related to the four aspects is well monitored, operates within relevant laws and regulations, and continuously improving.

EFFECTS OF CHURN

Material Calculators 2.0 reward reduced consumption and waste of materials. They specifically address inefficient use of materials caused by frequent replacement of interior fitouts.

Criterion 1: Re-used items
Re-using products is one of the best ways to reduce consumption and waste (Terry et al., 2007). The 'product classification' section of current material calculators rewards projects for re-using items.

Criterion 1 of the Material Calculators 2.0 continues to reward project teams for material re-use. The new calculator format highlights the importance of material re-use by elevating it to the first criterion.

Criterion 2: Product stewardship
A product stewardship contract addresses the fast churn rate of fitout items by assuring that items will not be disposed of in landfill.

The material calculators reward project teams for selecting products that have a stewardship contract. Criterion 2 of the Material Calculators 2.0 continues to reward the use of product stewardship agreements.

Criterion 3: Certified products
Selecting certified products results in improved environmental outcomes. In particular, certified products can be assumed to have addressed durability, design for disassembly, and modularity product stewardship.

Durability is no longer verified by a warranty. A product is considered to be durable if it complies with relevant 'fitness for purpose' standards. Green Building Council of Australia-approved product certification standards require compliance with these standards.

The material calculators reward project teams for selecting items certified by a Green Building Council of Australia-approved product certification scheme. Criterion 3 of the Material Calculators 2.0 continues to reward the use of certified products. Since 2009, more standards have been added to the list of Green Building Council of Australia-recognised certification schemes.

More information about Green Building Council of Australia-recognised product certification schemes is on the Green Building Council of Australia website www.gbca.org.au.

Criterion 4: Re-used, recycled or certified content
Re-using components and using recycled content prevents material wastage and reduces the demand for new materials. This reduces the impact of the high churn rate of fitouts.

The material calculators reward selection of components and content with environmentally preferable characteristics. Criterion 4 of the Material Calculators 2.0 continues to reward project teams for using recycled content and re-used components. This criterion also rewards the use of certified content.

DOCUMENTATION REQUIRED

Documentation required for assessment is defined clearly. Many complex compliance and documentation requirements have been simplified. These measures will provide certainty and reduce costs for users and product suppliers and manufacturers. They are designed to encourage use of all five criteria in the Material Calculators 2.0.

'Not Applicable'
Previous material calculators did not include a 'Not Applicable' option for when there are few items to be addressed. Documentation is now required in order to prove that a credit is not applicable.

'Modularity', 'Designed for Disassembly' and 'Durability'
The material calculators reward products which demonstrate durability, modularity and design for disassembly. Documentation of these characteristics for the Material Calculators 2.0 is now part of Criterion 3: Certified products.

Criterion 1: Re-used items
Documentary evidence required for re-used items has not changed significantly.

Criterion 2: Product stewardship
Documentary evidence required for product stewardship has not changed significantly.

Criterion 3: Certified products
Products are rewarded if they are certified by a Green Building Council of Australia-recognised product certification standard. Each of these standards verifies several product characteristics. All of these characteristics require complex documentation and are difficult to assess without a certification standard. Some of the characteristics able to be verified are:

- capacity of a supplier to provide product stewardship
- designed for disassembly
- modularity
- durability.

Further information about Green Building Council of Australia-recognised product certification schemes is on the Green Building Council of Australia website www.gbca.org.au.

Criterion 4: Re-used, recycled or certified content
Documentary evidence required for re-used, recycled and certified content has not changed significantly.

Criterion 5: Environmental management systems
The Material Calculators 2.0 require ISO 14001: 2004 certification. This defines the documentation requirements clearly. This documentation will be readily available to any organisation with ISO 14001 certification.

BENCHMARKS AND POINTS AWARDED

There is no change to the maximum point score available for each credit.

The material calculators reward improvements on common practice. However, standard practice has improved since 2005. The Material Calculators 2.0 have raised the threshold slightly for some criteria. This allows leadership and innovation to be rewarded appropriately.

Criterion 1: Re-used items
There is no change to the benchmark or points awarded for re-used items.

Criterion 2: Product stewardship
The current material calculators do not differentiate between leased and purchased products. The Material Calculators 2.0 reward leased products with stewardship agreements more than purchased products with stewardship agreements. Lease agreements are preferred because they are more likely to be effective. Lease contracts require suppliers to retrieve their products at the end of their use. This strong incentive for suppliers to retrieve products does not apply equally to items which have been purchased.

Criterion 3: Certified products
The current material calculators give the same reward to different levels of product certification standards. The Material Calculators 2.0 offer three levels of reward for different standards. The most stringent standards are classed as 'Level A' and receive the highest score.

'Durability', 'Modularity', 'Design for disassembly' and many other criteria are now rewarded as part of Criterion 3: Certified products.

More information about the Green Building Council of Australia's Assessment Framework for Product Certification Schemes, is on the Green Building Council of Australia website www.gbca.org.au.

Criterion 4: Re-used, recycled or certified content
The current material calculators reward recycled content, re-used and certified components that make up as little as five per cent of a product's mass. In future, this threshold will not be appropriate as ecologically preferred content is becoming more widely used. Forty per cent of a product's mass must be made of preferred content to earn a reward in the Material Calculators 2.0.

Criterion 5: Environmental management systems
The material calculators recognise products supplied by organisations with various types of environmental management systems. Standard practice has improved since 2005. As a result, Material Calculators 2.0 only recognise environmental management systems which is ISO 14001 certified and addresses particular relevant aspects.

Further information is found in the 'Material Calculators 2.0 Guide'.

7.0 FUTURE DEVELOPMENT

LIFE CYCLE ASSESSMENT

A 'life cycle assessment' (LCA) is an investigation and evaluation of the environmental impacts caused by the existence of a product or service.
The Green Building Council of Australia recognises the significant merits of assessing the relative environmental impacts of fitout products by conducting a full LCA of products in various categories. Two fundamental challenges must be overcome before LCA benchmarks can be incorporated into Green Star rating tools or other Australian rating frameworks.

The first challenge is to generate sufficient 'life cycle inventory' data that is specific to Australia. In order to sustain an Australian life cycle inventory, reporting and collection must become common practice for all industries involved in the manufacture of building materials.

The second challenge is to collate this data into an Australian life cycle inventory database which can be accessed readily and equitably by the developers of LCA tools.

Green Star rating tools cannot begin to incorporate LCA-based material credits until particular outcomes have been achieved in Australia. This includes:

- tool assessment methodologies
- data collection and manipulation requirements
- life cycle inventory database ownership.



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