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The Chairperson – Tool Development
Green Building Council of Australia

By Email: tool.development@gbca.org.au

RE: Life Cycle Assessment in Green Star – Discussion Paper

On behalf of the Gypsum Board Manufacturers of Australasia (GBMA), I would like to take this opportunity to commend the Green Building Council of Australia for its consideration of Life Cycle Assessment and its initiative in preparing a discussion paper dated 16 May 2012. I apologise for the lateness of the following commentary and hope there is still time for its consideration.

The GBMA is an association of all gypsum plasterboard manufacturers in Australia and New Zealand. The organisations comprising the GBMA are:

- BGC Plasterboard
- Boral Plasterboard
- CSR Gyprock
- Knauf Plasterboard
- Winstone Wallboards (a division of Fletcher Building Ltd)

As a participant in the Building Products Innovation Council (BPIC) Building Product Life Cycle Inventory (BP-LCI) project, the GBMA have made very significant progress toward the development of a national LCI database (AusLCI). The GBMA LCA data, as available on the BPIC website, has recently been submitted to AusLCI.

While the GBMA supports the use of eco-labels for material differentiation, eco-labelling is viewed as a practice of “branding” a product for marketing purposes, without revealing information. In the specific gypsum plasterboard case, material specifications focus on a single attribute (recycled content), and differ significantly between Australia and New Zealand, and have no alignment to actual environmental impacts as measured and demonstrated through life cycle assessment. However eco-labels do create significant market awareness and change, are simple to understand and easily communicated.

The GBMA view life cycle assessment as a more robust and scientific means of informing the material decision making process, and not an alternative to eco-labels ie, there is a place for both within Green Star.

The complexities of building systems and whole building assessment demands the integrity and transparency of a LCA approach to provide meaningful decision making. The GBMA fully support the inclusion of LCA within Green Star, and are pleased to provide the following comments on the discussion paper.

We trust these comments are of value and we would be pleased to answer any specific questions you may have.

Yours faithfully



David Thomas
Chairman

Provide your Feedback (Pg. 6)

Is it appropriate for the GBCA to undertake this project or would any other organisation be better placed to do it. If yes, which organisation?

Yes it is appropriate for the GBCA to undertake the project.

Is the Australian market ready for LCA as a tool for assessing the environmental impact of materials? If no, in how many year's time do you think the market would be ready?

Yes the market is ready for LCA. Several leading architects and builders have raised the question of LCA with GBMA members along with those of carbon neutral and nett zero energy. As such the market place is moving towards an LCA approach and a consistent & recognised assessment method across industry is welcomed. The BPIC-AusLCI project has significantly advanced industry and sector capability.

What do you see as the main barriers to implementing LCA as an assessment methodology for materials in Green Star?

Lack of broad knowledge, understanding, and training within the building and construction industry will hamper uptake and acceptance. Competitive sector commercial interest is the main barrier to implementing LCA. Some sectors will view it as a threat and seek to close the initiative down.

If the GBCA decided to introduce the methodology described in this paper, how much notice would you recommend the GBCA give to the market?

At least 12 months.

Objectives (Pg. 8)

The Green Building Council of Australia invites feedback from stakeholders on the objectives of the project.

The GBMA see the proposed discussion paper as aligning with the objectives of the GBMA and fully support the objectives of the project. In regard to EPD's, an LCA forms the core of these and therefore a materials manufacturer's LCA is seen to be sufficient for the purposes of a GBCA materials LCA without the need to go to an EPD.

Methodology – Scope of Assessment (Pg. 10)

The list of inclusions may be expanded in the future, is it appropriate to start with a limited scope of assessment in order to simplify the LCA?

It is not at all appropriate for the GBCA to exclude materials or systems from a building rating tool. To include some materials and exclude others would undermine the integrity of the approach and value of the tool and we recognise the importance of getting off to a good start with this tool.

Please provide feedback on the list of inclusions and exclusions.

The exclusions from the list are problematic (see above). In principle all permanently fixed items should be included as items such as mortar, paints, sanitary fittings, tiles etc. contribute to emissions and internal walls and partitions, lifts, HVAC, light fitting etc. are a significant component of a "sealed and serviced" building. We think that everything should be included except for loose furnishings and emissions and energy associated with construction and deconstruction.

Are there additional materials that should be addressed by the inclusions and exclusions?

The GBMA recommend the inclusion of gypsum plasterboard due to the significant volumes used in construction, and robust plasterboard LCA information is in the public domain.

Boundary Definition (Pg. 11)

Is the use of a 'cradle to constructed, sealed and serviced' building approach appropriate?

Yes

Is it practical to make qualified assumptions about the origin and the distances that material must be transported in a Green Star design submission, ie, at a tender stage when some the specific materials are unknown?

Yes it is practical but it should be made clear that these are assumptions that may be questioned at a later date. It is practical at the concept stage for materials for the basic structure but probably not for fixtures and fittings.

Functional Unit (Pg. 12)

Is 1m² of GFA an appropriate unit?

Building lifetime is an important consideration that significantly affects design decisions and environmental performance. Accordingly an appropriate functional unit for a building will involve a unit of area **and** time- m².yr⁻¹ is commonly used and we urge its use for this purpose.

On the assumption that all the inputs & emissions are added together, whether they stem from a per m², per m³, per tonne, per unit or whatever, for the total building, and are then divided by the GFA then this seems reasonable.

Are there constraints to using this unit?

Comparisons between constructions that differ significantly in scale and physical dimensions may be spurious

If there are constraints or reservations about the proposed functional unit, what are the alternatives?

See above.

Environmental Impact Categories (Pg. 13)

Is it appropriate to limit the number of environmental impact categories to six?

The GBMA support the simplicity of the proposed 6 impact categories but the impact categories require further examination. The water use metric doesn't take into account the location of that water use or whether it is recycled water and therefore is open to spurious assertions. The cause and effect mechanism behind land use and transformation and an environmental impact is not well defined. Hectares of land used is a simplistic measure. Further there are other important metrics that, such as solid waste production, that are omitted.

If more categories are to be included, which categories do you recommend be included? What method should be applied to determining the impact categories the LCA will take into account?

The GBMA recommends following the scheme used in the BRE assessment in the UK.

If fewer categories are to be included which categories do you recommend be removed?

NA

If six impact categories are appropriate, are the six categories above the most appropriate?

Ozone depletion and eutrophication are significant. There is overlap in the impact categories (e.g. ecotoxicity to land and water) and the measures are simplistic and require more specific definition.

Is it appropriate to refer to the AusLCI impact categories? Is there an alternative which should be used? Why?

The GBMA support alignment between AusLCI and the use of LCA within Green Star.

Weightings of Environmental Impacts (Pg. 14)

Is it appropriate to reference the BC LCI weightings? If not, what should be used instead?

In principle the GBMA supports the use of weightings however weightings are a contentious issue. Transparent, scientific, fact based weightings would be acceptable but the BPIC weightings are based on limited opinion and given the number of impacts tend to average out the weightings such that no one rating is significant. Limited significant impacts should be weighted and adopted.

Is it appropriate to have separate credits for each of the environmental categories or should the total score be weighed together and assessed in one credit?

The total score should be weighted together and assessed as one. If the weightings are agreed then a single credit is acceptable.

The Assessment Model (Pg. 17)

Is it practical to establish a standard practice reference case for low-rise and high-rise buildings of different classes? If not, what other methods could be used to establish a reference case?

The GBMA does not support the use of standard practice reference cases.

Material selection should be through the use of “system calculators” that allow the comparison of various material and system options, but preferably at the design phase. Ultimately the LCA should be used to optimise the material selection to minimise impact. The reference case appears to force fit LCA into a green star tool, covering both embodied and operating impacts. Perhaps this needs to be done in two stages – an LCA for the essential structure at concept stage and green star tool at the more detailed specification stage?

Should the reference case distinguish between new building on a green field site, refurbishment of existing buildings and fit outs? How can an equitable system be developed which acknowledges the advantages of the options from an environmental impact perspective?

This is where an LCA would arrive at an optimised solution between alternatives rather than referring to a reference case.

If the reference case is constructed in a similar manner to that described above, would you be able to provide your interpretation of how this may operate in practice?

No comment.

Can LCA methodology in the Green Star Materials category operate without a reference case? If so, how do you see this working?

Yes, by comparing alternatives.

Is it practical to conduct two iterations of the LCA with different inputs for the project?

Yes if you're committed to achieve an optimised solution. Improvement & refinement is part of the overall design process.

How much additional time would it take to do the second iteration of the LCA having completed the first one? Is it 25% more, 50% more, 100% more etc.?

Unable to comment.

Does the intended content of Table 1 include enough data to determine the input parameters for the standard practice case LCA? If not, what is missing?

No, the data in Table 1 is incomplete. The building component list excludes some key materials and table lacks the required detail. It should be utilising the BPIC database.

What would be the best way to determine the rules for the input parameters in Table 1?

No comment.

Reporting Mechanism (Pg. 17)

Is it appropriate to nominate ISO 14025 as the reporting mechanism?

The GBMA supports the use of ISO 14025 and the use of LCI data within Environmental Product Declarations.

Is there an alternative that is preferred or should be considered?

No comment.

Allocation of Green Star points (Pg. 18)

Is percentage reduction in impact an appropriate way to award points for improvement?

This may be a moot point if material selection is made on the basis of optimizing a LCA however a percentage reduction concept would be acceptable if the GBCA sees this as appropriate for the awarding of points.

Is it appropriate to have separate credits for each of the environmental categories or should the total score be weighed together and assessed in one credit?

For simplicity, the GBMA supports a total score weighed together in one credit.

Data Inventory (Pg. 19)

Should the Aus LCI Building Product inventory dataset be used in a LCA methodology within Green Star rating tools?

The GBMA fully support the AusLCI dataset and its use within Green Star.

Should a European LCI be used?

Only as a default if Australian data is not available.

Are penalties needed?

No.

What data sources would be acceptable for a credible LCA to be conducted?

Data sources need to be evaluated on a case by case basis and the appropriateness needs to be declared as part of the supporting material for a LCI/LCA. The LCA practitioner is best placed to assess this and may be restricted by the lack of suitable data. For transparency & checking data sources should be acknowledged

Applicable Green Star rating tools (Pg. 20)

Is it appropriate to exclude fit-outs based on the lack of an agreed functional unit for fit out items?

The GBMA support the inclusion of fit-outs.. Fixed fittings should be included but not loose fittings

Other matters for discussion (Pg. 21)

Will the proposed LCA methodology accommodate existing LCA systems and tools?

No comment.

What constitutes an LCA practitioner, what qualifications should be required, and should the system ALCAS are developing be referenced?

ALCAS should define, monitor, and accredit this.

How much would you estimate it would cost to complete the assessment outlined in this paper? And how does that cost compare to the cost of demonstrating compliance with the current Materials Category in Green Star?

Unable to comment

Is the requirement to adhere to international standards necessary?

Yes, for process integrity, legal liability and to ensure that the environmental reporting mechanisms don't become a non-market barrier.

Which are the relevant standards that Green Star related LCAs should adhere to?

No comment.

Is the requirement to use recognised software necessary?

No.

Should the GBCA recognise particular softwares?

No - but it would be useful to make the life cycle inventory datasets available in the ecospold format.

Leave it to ALCAS.

Which software should be recognised, and why?

See above.

The requirements of the Energy category within Green Star rating tools, stipulate that any energy simulation software used are BESTEST compliant. Does equivalent software exist for LCA?

No comment.

Is the requirement for peer review necessary?

Yes absolutely.

What other requirements are necessary to ensure best practice LCA modelling?

A lot of the ground-work for the methodology and assessment of LCA studies is detailed in the ILCD system and the GBMA recommends consulting this as a guide for systemic developments.

Yours sincerely

David Thomas
Chairman