

Life Cycle Assessment in Green Star

Discussion Paper

Introduction

This document has been produced in response to the Green Building Council of Australia's (GBCA) request for feedback on the issue of Life Cycle Assessment.

Cox Architecture do not have direct expertise in LCA however we offer our opinions as a national architecture practice with a long involvement in the design and construction industry, a strong interest in sustainability and as GBCA members. We have provided comment only where our expertise allows, acknowledging that many of the technical issues need to be resolved with the assistance of LCA specialists.

Executive summary

Cox Architecture believes strongly that the GBCA should move towards an LCA approach. The GBCA has shown leadership on green building issues and should continue to do so; change is always harder than the current path yet this should not discourage true leaders from forging towards a better future.

The strategy outlined in the discussion paper appears to propose an assessment of the materials only; we would suggest consideration of a whole building approach. An assessment that incorporates operational energy, transport energy of building occupants, planned maintenance and periodic equipment replacement in addition to the life cycle impacts of the materials would provide a quantifiable assessment of buildings sustainability. We view this approach as being more holistic and assisting industry in getting closer to the goal of genuine sustainability. We acknowledge the conflicts that would arise from this in relation to other Green Star credits but believe they are surmountable. This approach could reduce complexity across the tool, allowing for the cost-neutral implementation of LCA into Green Star.

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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?

The GBCA should show leadership on LCA. The GBCA's dominance of green building certification in Australia means that they are the most appropriate organisation to do so. To not encompass LCA within Green Star opens the possibility that a simplified tool assessing a building purely on Life Cycle Analysis may be developed creating confusion and complexity in the marketplace.

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

A well designed LCA pathway for Green Star would encourage industry to move towards a more considered and holistic platform. Many products are already assessed using LCA through GreenTag LCA indicating that the cutting edge of industry is already moving in that direction in terms of data collection and assessment. A strong signal from the GBCA would further encourage others to go down that path.

The problematic areas of data availability will need to be managed in the short term; a strong signal from the GBCA and industry would assist the progression of the datasets.

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

There would be a cost implication for LCA, we are unable to comment on the precise value but some may view that as a barrier. We would hope that improved information flow would allow for better environmental outcomes that have a proportionally better impact on economic value; this would be an interesting area of research for the GBCA too.

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?

Yes although the exclusions should be determined by an expert panel. Elements should only be excluded where reliable data is unavailable and/or the impacts of the elements can be considered minor in relation to the building as a whole. A timetable should be established for full inclusion of all elements of consequence to allow for certainty.

Please provide feedback on the list of inclusions and exclusions.

We would suggest that flooring should be included due to the variety of options available and their varying life cycle impacts especially when including maintenance impacts.

Lighting systems should also be included as the operational energy associated with them can have a high impact.

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

No.

It would be preferable to take a Cradle to Grave approach. The exclusion of maintenance impacts lacks a holistic focus potentially allowing a long term detrimental product to ‘win’ over another with reduced maintenance requirements. A true LCA would be accounting for all impacts. The use of a ‘third’ option will add complexity to the system; the GBCA should work within the existing parameters of the LCA sector.

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

It may only be feasible to take industry averages for transportation distances. It highlights the issue with the Design ratings not necessarily reflecting the built outcome; this is unlikely to be easily resolved within this credit.

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

No.

The strength of the system lies in its holistic nature. In order for the rigour to be upheld all it should be based on current best practice; as the Building Products Innovation Council (BPIC) and Australian Life Cycle Assessment Society (ALCAS) have determined in accordance with global standards that 14 categories are necessary then the GBCA should adopt the same procedures, to do otherwise leaves the system open to criticism and creates added complexity.

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?

All the categories identified by BPIC and ALCAS should be included.

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

The impact categories used should be agreed across the LCA sector, as AusLCI is the current standard then the GBCA and others should work to consolidate and strengthen that framework.

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

While we are unqualified to speak on the appropriateness of the proposed weighting system we do advocate for the use of a system developed and supported by AusLCI. The creation of a Green Star-specific weighting system would be undesirable.

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?

One credit only.

The flexibility offered by setting a Green Star benchmark for the whole project would be desirable. A category-by-category approach is contradictory to the holistic nature of LCA; any methodology that encourages industry to move towards design-led solutions over box-ticking exercises must be encouraged and rewarded.

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

A baseline must be established in order to measure improvement.

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

This will depend on the scope of the LCA, see comments in the Executive Summary.

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

It seems unlikely as a benchmark needs to be established to measure improvement.

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

Yes.

Using a consistent, industry accepted, globally developed standard would be desirable to maximise uptake through reduced compliance.

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

Yes.

It may be desirable to increase the points available so that significantly higher performance is rewarded with proportionally higher 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?

One credit only.

The holistic nature of LCA demands a holistic approach to points allocation. Awarding points across the whole LCA will encourage more holistic solutions; consideration also should be given to an increasing minimum in every category to ensure that all categories are improved upon.

Is it appropriate to exclude fitouts based on the lack of an agreed functional unit for fitout items?

No.

We would advocate strongly that this issue should be resolved as soon as possible due the high impact nature of fitouts, primarily their much shorter life span.

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

LCA practitioners must be accredited through a recognised organisation. ALCAS may be appropriate for this task; we would advocate for an approach similar to ABSA (Association of Building Sustainability Assessors) who assess and accredit practitioners to conduct energy performance ratings of buildings.

Is the requirement to adhere to international standards necessary?

Yes.

The use of accepted Standards is key to the credibility of the system.

Is the requirement to use recognised software necessary?

Yes.

Any software must be assessed and accredited to ensure consistent standards and maintain the integrity of the system.

Should the GBCA recognise particular softwares?

The software should be accredited by an appropriate organisation. The GBCA may be that organisation or responsibility could be passed to a third party.