AUSTRALIAN FOREST PRODUCTS ASSOCIATION (AFPA) COMMENT ON THE GREEN BUILDING COUNCIL OF AUSTRALIA (GBCA) LIFE CYCLE ASSESSMENT IN GREEN STAR DISCUSSION PAPER

AUGUST 2012

Introduction

The Australian Forest Products Association (AFPA) welcomes the opportunity to comment on the Green Building Council of Australia (GBCA) Life Cycle Assessment (LCA) in Green Star Discussion Paper (the Paper).

AFPA was formed by the merging of the Australian Plantation Products and Paper Industry Council and the National Association of Forest Industries. AFPA is the national industry association representing the Australian forestry, wood and paper products industry's interests to governments, the general public and other stakeholders on matters relating to the sustainable development and use of Australia's forest, wood and paper products in Australia.

This submission from AFPA is made on behalf of industry, and builds on previous industry engagement with the GBCA and Green Star (particularly discussions regarding the development and review of the timber credit).

The Forest, Wood and Paper Products Industry and Building Industry

The forest and wood products industry is one of Australia's largest manufacturing industries with an annual turnover of $21.4 billion. It contributes around 0.6 per cent to Australia's gross domestic product and 6.7 per cent of manufacturing output. Approximately 76 800 people are directly employed in the industry, including 13 200 people in the forestry and logging sectors and 63 600 people in the wood manufacturing sectors (DAFF 2010).

The forest and wood products industry is a significant contributor to the building and construction industry. The ongoing role of the building and construction industry to the economic stability and growth of the broader Australian economy should again be recognised. The forest and wood products industry's major market demands a wide range of fit for purpose wood products and increasingly seeks these products because of their flexibility and environmental credentials.

The forest and wood products industry supports the building and construction industry in terms of both product and innovation. It is also highly committed to sustainability principles and advancing its contribution to overall sustainability in Australia.

Forest Industries House • 24 Napier Close Deakin ACT 2600 • PO Box 239 Deakin West ACT 2600
Tel 02 6285 3833 • Fax 02 6285 3855 • enquiries@ausfpa.com.au • www.ausfpa.com.au

General Comment on the Paper

AFPA supports the principle of incorporating LCA into the Green Star system.

Wood products are natural, renewable, and recyclable. Trees sequester carbon and wood products store carbon while in service and beyond. Previous studies using the principles of life-cycle analysis show that the use of wood products is consistently more green-house friendly and the manufacture of these wood products typically requires less energy than alternative products.

In principle, AFPA supports GBCA's stated objectives of the project that include:

- Develop a transparent and consistent methodology for assessing the environmental impact of construction materials using life cycle assessment;
- Continue to assist and facilitate the uptake of best environmental practice product and materials selection in the Australian construction market;
- Facilitate the use of ISO 14025, Environmental Product Declaration (EPD) for materials assessment in Australia;
- Deliver better environmental outcomes; and
- Deliver these outcomes in a cost-effective manner.

It is suggested that these objectives should continually be referenced as a framework to measure the development, structure and direction of this project.

AFPA strongly supports the principle established in the existing timber credit of equal recognition of credible third party forest management (FM) and Chain of Custody (CoC) certification schemes (AFS/PEFC and FSC), and expects that GBCA will maintain and integrate this principle into the new project.

Specific Comment on the Paper

AFPA provides specific responses (as appended in *Attachment 1*) to many of the questions contained in the Paper.

Summary

AFPA appreciates the opportunity of commenting on the Paper and is pleased that the GBCA is looking to incorporate the principles of LCA into the Green Star model. AFPA and industry representatives are happy to continue to work with the GBCA and other stakeholders on the development of this project as it progresses. We hope the GBCA will develop and improve the initiative by considering the comments in this, and other like, submissions and via further consultative processes.

Any queries about this submission or contact for subsequent actions on this project, please contact Gavin Matthew (Manager Processing) on gavin.matthew@ausfpa.com.au or (02) 6285 3833.

Australian Forest Products Association - 15 August 2012

ATTACHMENT 1: GBCA QUESTIONS IN THE PAPER AND AFPA RESPONSES

Q1 - [Page 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?

AFPA acknowledges that GBCA and the voluntary Green Star system has been effective in influencing the 'Australian property industry towards sustainability by promoting green building programs, technologies, design practices and operations as well as the integration of green building initiatives into mainstream design, construction and operation of buildings.' *(GBCA objectives on website)*

It is considered appropriate for GBCA to coordinate the development of the project. However given LCA is a relatively new, complex and developing system it is recommended that much of the development work would be undertaken by independent experts that have knowledge of LCA processes (such as members of the Australian Life Cycle Assessment Organisation (ALCAS)). GBCA will also need to continually engage with stakeholders and experts in the specific building product sectors in order to effectively develop and integrate LCA principles into the Green Star system and then implement it.

For consumers to have confidence in LCA based assessment generally it is important that various credible systems are developed and in use in order to produce comparable outcomes.

Q2 - [Page 6] 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?

As Australia moves towards a low carbon future LCA is increasingly important. Frameworks such as the GBCA Green Star should recognise both embodied and operational energy. Australia is lagging behind other countries such as Canada and European countries in recognising and implementing LCA principles.

AFPA broadly sees that the Australian building and construction market is ready to adopt LCA as a tool for assessing the environmental impact of materials used.

It is understood the market view is that it wants good environmental outcomes without significant cost. The Australian building and construction industry is relatively diverse, with some sectors and products mature, receptive and making significant progress in introducing environmentally based initiatives, and others that will need time/resources to aid adoption of this approach. These different sectors and products will have varying levels of LCA information, knowledge and tools that will require a planned period of development prior to implementation of the system. It should also be coupled with an effective education and information transfer strategy.

AFPA supports the use of LCA in environmental assessment of materials and comparisons in buildings. LCA can provide a detailed structured process of quantifying all the potential environmental impacts of a product, element or building throughout its entire life (cradle to grave).

LCA, when done in accordance with appropriately developed standards and protocols, provides the only true scientifically based, level playing field approach to environmental assessment compared to the limitations of other approaches.

AFPA considers that incorporating LCA would add value to the Green Star system. LCA makes that next step in sophistication of the Green Star system adding to its acceptance and credibility in the market, in part by recognising the embodied energy in building materials.

The forest and wood products industry has been a supporter of and innovator in LCA for over a decade and was an early moving sector in undertaking a detailed 'cradle to gate' Life Cycle Inventory (LCI) data collection R&D program. In 2009, the sector through our R&D funding body Forest and Wood Products Australia (FWPA) published a report prepared by the CSIRO detailing LCI data for forest processes, and the manufacturing of timber and wood products such as sawn timber, veneered product, panel products and engineered wood products (Report number PNA008-0708)

In addition the industry has been an active participant in, and data supplier to, the Building Products Innovation Council's (BPIC) Building Product Life Cycle Inventory Data project.

Q3 - [Page 6] What do you see as the main barriers to implementing LCA as an assessment methodology for materials in Green Star?

Some of the challenges to implementing LCA include;

- Given LCA is still in its relative infancy, an appropriate, effective and fair approach to incorporating LCA principles needs to be developed then coupled with relevant data and LCA design tools for building professionals;
- Education and information transfer of the basic and application benefits of LCA to a broad and complex building and construction industry. It is suggested that an effective education and training program is certainly needed. GBCA through its existing channels and in association with relevant industry bodies is well placed to undertake the education and information transfer program;
- Application of LCA is data intensive, so the availability, quality and consistency of the necessary data to underpin the wide range of building products is essential to ensure comparison between alternative building products is fair and equitable;
- As a function of the LCA approach being in its early adoption phase, there is a current lack of incentives/motivation for the building materials industry to maintain industry average data or supply individual product LCI data (i.e. through Environmental Product Declarations (EPD) or similar). This project would be one driver to change that incentive; and
- Lack of available LCA experts (both external and in-house) to apply LCA based design tools.

AFPA does not see these challenges as insurmountable and the benefits for incorporating LCA principles into Green Star could be significant.

Q4 - [Page 6] If the GBCA decided to introduce the methodology described in this paper, how much notice would you recommend the GBCA give to the market?

As discussed in Q2, different sectors and products in the market are at different stages in LCA sophistication and receptiveness. As a result, it is suggested that the market would need at least 1 to 2 years for education and implementation post development of an appropriate model. This is not a short-term project but one that can yield significant benefit in the longer term.

Q5 - [Page 8] The GBCA invites feedback from stakeholders on the objectives of the project.

The stated objectives have merit. In regard to the use of Environmental Product Declarations (EPD) as a basis for materials assessment, we see that as a worthy objective. However it will take time to implement and get right. It is suggested that EPD's should be used as an optional basis for materials assessment in the first phase and an education program implemented to generate wider acceptance and understanding of them into the future.

Q6 - [Page 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?

Starting with a limited list of inclusions in the first phase of the project has merit. The initial testing of the concept on a limited selection of known, understood and agreed inclusions would aid implementation and acceptance.

A couple of additional points should be considered and addressed:

1. The inclusions contained in the initial limited list should still be fair and equitable across the different material types and sectors. It should not provide an opportunity to cherry-pick different inclusions to potentially advantage any one industry sector; and
2. There may be issues with comparison of other LCA based systems or compatibility of outcomes if a limited list of inclusions continues into the longer-term.

Q7 - [Page 10] Please provide feedback on the list of inclusions and exclusions.

The list of inclusions seems appropriate in the first phase of the project. However we consider that there would be significant benefit if some elements that are currently proposed are included. These include:

- reinforcing steel in reinforced and precast concrete;
- internal partitions and wall and ceiling finishes (as planned and built);
- flooring / floor coverings (as planned and built);
- mortar in brickwork;
- stairs, handrails & balustrades (as planned and built); and
- shading structures on the exterior skin of the building.

Q8 - [Page 10] Are there additional materials that should be addressed by the inclusions and exclusions?

We expect that over time there will be other elements that will be identified and should be included and suggests that GBCA establish an appropriate process to review the list as new products, elements, knowledge and expertise emerge.

Q9 - [Page 11] Is the use of a 'cradle to constructed, sealed and serviced' building approach appropriate?

In the first phase of the project, and in light of the complexities of the LCA approach, the use 'cradle to constructed, sealed and serviced' building approach is appropriate. AFPA sees this as an initial step. Ultimately the various life cycle stages of a building should be included: 'cradle to gate', 'operational' and to the 'end-of-life.

It is proposed that the first stage addressed should be the assessment and inclusion of the embodied impact of building materials (generically described as 'cradle to gate'). There are many tools and previous studies on the as '*cradle to gate*' stage that could be leveraged into, and compared with, this project. The additional stage of '*cradle to constructed*' is seen to require an assessment of specific construction activities. This additional stage may require GBCA seeking new work and knowledge if not already and easily available.

While operational impacts are relatively easy to measure, they provide only part of the picture and can be misleading. The importance of environmental impacts embodied in building materials (embodied impacts) are significant and is often misunderstood or understated, especially when compared to the operational impacts (such as energy consumption for heating, ventilation and cooling). Studies (such as RMIT/FWPA (Mar 2011) – Comparative LCA of alternative constructions of a typical Australian House Design) have shown it is important especially in an Australian context. As a result choices in materials resulting in improvements in embodied impacts can yield significant benefits.

Q10 - [Page 11] 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?

Making qualified assumptions appears logical and appropriate at the 'tender stage'.

An issue that will need to be considered and addressed is if the assumptions made at tender stage are industry averages and subsequently the actual materials used have been imported with an associated different origin and transport profile. This would result in inaccurate or misleading outcomes from the LCA assessment impacting on alternative building products use.

Q11 - [Page 12] Is 1m² of GFA an appropriate unit?

In the initial project phase per m² of gross floor area (GFA) as the "functional unit" seems appropriate and logical. As more information/tools emerge this should be reviewed. Impacts on perceptions of, and penalties on, the relative floor areas of buildings should be considered and assessed as part of the development of the project so no perverse outcomes occur.

Q12 - [Page 12] Are there constraints to using this unit?

Refer to Q11 above.

Q13 - [Page 13] Is it appropriate to limit the number of environmental impact categories to six?

For the initial phase of the project commencing with a limited number of environmental impact categories has merit. Environmental impact categories included should be well known, well understood, well defined, based on science, and wood products should not be disadvantaged.

Q14 - [Page 13] 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?

If an additional LCA impact assessment category is proposed to be added then that category should be well known, well understood, well defined and based on science. Even better if it is already commonly reported and featured in other standards and initiatives.

Q15 - [Page 13] If fewer categories are to be included which categories do you recommend be removed?

The proposed environmental impact categories 'Land Transformation & Use' and 'Water Depletion' should be removed in the initial phase of the project. They are not currently well understood or well defined.

The current ALCAS *Best Practice Guide to Life Cycle Impact in Australia* notes that Land Transformation and Water Use are '*provisional methods that need development*; both use a simple summation approach (total volume of water, total area of land). This simple summation approach gives distorted results for broad scale agricultural production including forests/plantations, as such should not be included until a more detailed and effective approach is agreed in Australia.

The current LCA methodology of aggregation:

- in the case of Water Depletion, does not reflect that forests/plantations that produce timber products consume water over long time periods and that the vast proportion of the water attributed to forests/plantation consumption is due to a natural process 'evapo-transpiration' (i.e. around 95%) which the water is then cycled back into the environment as rain. In addition it doesn't factor in the other environmental benefits from forests/plantations in the hydrological cycle including improving water quality; mitigating dry-land salinity; soil erosion protection; increased carbon storage; increased habitat and biodiversity; and control of certain plant pests by vegetative competition; and
- in the case of Land Transformation and Use, looks to favour land use with a small footprint but relatively high impact, a seemingly perverse environmental outcome when compared to a land use such as forest management where the aim is to maintain and enhance the multiple values within the managed forest area (i.e. over a large footprint).

Q16 - [Page 13] If six impact categories are appropriate, are the six categories above the most appropriate?

Refer to Q15. The proposed environmental impact categories 'Land Transformation & Use' and 'Water Depletion' should be removed in the initial phase of the project. They are not currently well understood or well defined.

Q17 - [Page 13] Is it appropriate to refer to the AusLCI impact categories? Is there an alternative which should be used? Why?

For reasons of consistency, availability and standardisation it would be appropriate to refer to the AusLCI impact categories.

Q18 - [Page 14] Is it appropriate to reference the BPIC LCI weightings? If not, what should be used instead?

For weightings to be effective and equitable they need to be well developed, accurate and representative of the actual relative impact of the category. There is still significant uncertainty about weighting values including the BPIC LCI weightings. If specific weightings are proposed to be added they should be developed, revised, updated in future phases of the project.

Q19 - [Page 14] 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?

Applying separate credits for each of the environmental categories is a logical approach, to gain maximum benefit of LCA, clarity of data, and realise the ability to compare within and across environmental categories,

Q20 - [Page 17] Is it practical to establish a standard practice reference case for low-rise, mid-rise and high-rise buildings of different classes? If not, what other methods could be used to establish a reference case?

In the initial phase of the project it seems logical to establish a standard practice reference case. In the longer term it is proposed that GBCA would replace the more simplistic standard reference case method with a more comprehensive full life cycle assessment of the actual building including all stages up to end-of-life.

Q21 - [Page 17] 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?

Over-time to achieve the maximum benefit of an LCA approach reference cases that distinguish between new buildings on a green field sites, refurbishment of existing buildings and fit-outs is a logical approach. This approach would better underpin a like with like comparison. These different sectors will become increasingly important due to an aging building stock and the ongoing desire to update. There should be incentives for the reuse of existing structure and materials as well.

Q22 - [Page 17] 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 feedback.

Q23 - [Page 17] Can LCA methodology in the Green Star Materials category operate without a reference case? If so, how do you see this working?

As the LCA approach matures, it is suggested that LCA design tools will be/have been developed that allow designers to effectively and quickly undertake multiple LCAs of the same proposed building with different inputs, building systems and solutions. This approach would seek to demonstrate that the final planned building design has been optimised for its relative environmental impact (i.e. from the designer's original base design rather than a standard reference case).

Q24 - [Page 17] Is it practical to conduct two iterations of the LCA with different inputs for the project?

For designers to compare and contrast the relative environmental impacts of alternative building materials and designs using a LCA approach it would be optimal to undertake multiple iterations. So it is seen as not only practical but ultimately necessary. This is where effective LCA design tools (i.e. computer based) will aid the designers' ability to rapidly and cost-effectively compare the environmental impact of alternative building materials and designs.

Q25 - [Page 17] 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?

Not certain. However it is seen that with an effective computer based LCA design tool the additional time to run alternative iterations would be estimated to be minimal.

Q26 - [Page 17] 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 feedback.

Q27 - [Page 17] What would be the best way to determine the rules for the input parameters in Table 1?

No feedback.

Q28 - [Page 17] Is it appropriate to nominate ISO 14025 as the reporting mechanism?

Yes. Appropriate international standards should be used in the absence of alternative Australian Standards.

Q29 - [Page 17] Is there an alternative that is preferred or should be considered?

No feedback.

Q30 - [Page 18] Is percentage reduction in impact an appropriate way to award points for improvement?

A percentage 'reduction in impact' approach seems logical. The GBCA should consider the interaction (both positive and negative) between impact categories of a certain action (as one positive action in one impact category may adversely impact another impact category) and develop a method to address it.

Q31 - [Page 18] 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?

Yes. There is a preference to have separate credits for environmental impact categories to allow individual comparison of the improvements within each category.

Q32 - [Page 19] Should the Aus LCI Building Product inventory dataset be used in a LCA methodology within Green Star rating tools?

It will be logical to utilise standard, agreed and recognised datasets, such as the existing ALCAS AusLCI datasets. It is understood that the ALCAS AusLCI data is being updated, improved and added to on an ongoing basis.

Q33 - [Page 19] Should a European LCI be used?

No. Not if there is existing Australian data. Origin like-data for origin like-product is preferred to make the assessment specific and applicable.

Q34 - [Page 19] Are penalties needed?

Suggest that in a voluntary system, positive incentives would have more merit than penalties.

Q35 - [Page 19] What data sources would be acceptable for a credible LCA to be conducted?

Data sources described by the BPIC LCA Protocol hierarchy of data sources with AusLCI as the first source are preferred. Refer also to Q33 above.

Q36 - [Page 20] Is it appropriate to exclude fit-outs based on the lack of an agreed functional unit for fit-out items?

A range of major fit-out items should be included as the project develops, such as internal partitions, wall & ceiling finishes and flooring / floor coverings (i.e. at the planned stage). Suggest the initial functional unit could still be m^2 of gross floor area (GFA). Using a replicable computer based design tool calculations should be relatively simple.

Q37 - [Page 21] Will the proposed LCA methodology accommodate existing LCA systems and tools?

The proposed LCA methodology seems to be flexible enough to accommodate existing LCA systems and tools. As the project develops the methodology should look to incorporate updated and accepted Australian LCA systems and tools.

Q38 - [Page 21] What constitutes an LCA practitioner, what qualifications should be required, and should the system ALCAS are developing be referenced?

LCA practitioners/assessors should be trained, experienced, credible, accredited (third party), and independent as a guide.

Q39 - [Page 21] 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?

No feedback.

Q40 - [Page 21] Is the requirement to adhere to international standards necessary?

Appropriate international standards should be used in the absence of alternative Australian Standards.

Q41 - [Page 21] Which are the relevant standards that Green Star related LCAs should adhere to?

Appropriate international standards should be used in the absence of alternative Australian Standards. These would include a number of standards in the current ISO 14040 and ISO 14020 series. Effort should be made to develop Australian Standards where they don't exist, and where considered relevant and beneficial.

Q42 - [Page 21] Is the requirement to use recognised software necessary?

We see the use of appropriate and benchmarked software design tools and software will be needed to underpin a flexible, comparable and cost effective LCA framework.

Q43 - [Page 21] Should the GBCA recognise particular software?

An agreed framework to recognise LCA software tools on a fair and equitable basis has merit and will underpin confidence that the tools are doing the appropriate job. It is suggested the GBCA should look to develop and maintain that type of framework it would be in conjunction/association with other independent and expert bodies (such as ALCAS).

Q44 - [Page 21] Which software should be recognised, and why?

No feedback.

Q45 - [Page 21] Does equivalent software exist for LCA?

No feedback.

Q46 - [Page 21] Is the requirement for peer review necessary?

When comparative assessments are undertaken a process of peer review has merit to ensure credibility during development and revision.

Q47 - [Page 21] What other requirements are necessary to ensure best practice LCA modelling?

As the project develops it is proposed that to further underpin LCA modelling:

- Key product/site waste allowances are incorporated. It is understood that product LCIs should include, and account for, wastage to the processors gate, onsite wastage as a result of construction is not usually included. Wastage can potentially be a significant factor and can impact on environmental indicators (such as climate change impact category) if it is a material that has used a lot of fossil fuel/energy to produce; and
- The use of Environmental Product Declarations (EPD) as a basis for materials assessment we see as a worthy objective but one that will take time to implement and get right. It is suggested that an EPD education program is implemented to generate wider acceptance and understanding of them into the future (refer to Q5 above).

[END]