

# Life Cycle Inventory (LCI) Development

The Cooperative Research Centre for Construction innovation developed the LCI using Australian and international data as outlined below.

## 1 The parts of LCI databases

The LCI has six parts, wholly developed in Australia, including electronic and hard copy in:

- 1.a Corporate libraries of papers and reports on method, metadata, data sources, results and pilots.
- 1.b Result databases and calculation engines residing in the LCADesign software.
- 1.c Component databases compiled for uploading into LCADesign software.
- 1.d Libraries of site, corporate, project LCI measures and data plus theoretical calculations.
- 1.e Working proforma, maps, assumptions, calculations, drawings, metadata, recipes and results.
- 1.f Data storage capacity and files held in CRCCI and licensed software programs.

The LCI is copied to a top domain of a UK developed Boustead Consultant Ltd (BCL) Model. It arrives with >13,000 industry operations in bottom core databases. CRCCI however never relies on data in this core but uses the Models calculating engine. This UK-made vehicle carries >90% Australian-made data cargo.

## 2 Key Developers of Australian Content

The LCADesign LCI was developed continuously in Australia employing the:

- 2.a NSW Public Works and Services (DPW&S) LCI (4000 recipes) from 1995 to 1999 and
- 2.b The CRCCI LCI including domestic and importer operations from 2001 to 2008 [1,2, 3]

## 3 Australian Content of the NSW Government LCI

The DPW&S LCI was compiled with data direct from local manufacturers and resellers [4, 5] to:

- 3.a Apply performance assessment of all NSW Government Supply recurrent contracts.
- 3.b Audit Sydney Olympic Games Public/Private development projects;
- 3.c Conduct the first LCA of an Australian public building i.e. Stadium Australia;
- 3.d Assess environmental performance of Public buildings including Schools;
- 3.e Develop BASIX for environmental assessment of Development Approvals, and
- 3.f Develop LCAid software for environmental assessment of building design.

## 4 Australian Content of CI Australian LCI databases

The CI LCI development has involved work of:

- 4.a Seven staff in the Environment Design Unit of the NSW DPW&S over 5 years.
- 4.b Teams of researchers from CI partners in four LCADesign projects over 8 years.
- 4.c Expansion with data from Queensland Public Works, CSIRO, RMIT and other CI partners.
- 4.d Updating data from Australian Glass, Steel, Concrete and Timber Manufacturers, IBIS on industry activity, US Central Intelligence Agency Commodity and Mineral Year books 2001-08.
- 4.e Auditing against Australian, Canadian, USA, Swiss, Dutch, German and English LCI datasets.
- 4.f Comparing inputs from LCI Models e.g. Simapro and EcoInvent databases and Athena software.

## 5 Australian Content of CRCCI International LCI databases

After developing the Australian version of LCADesign, overseas pilots were conducted. These required development, in Australia, of new LCI databases customised for use in:

- 5.a California for analysis of Stanford University's Green Dorm considering seismic damage cradle to end of design life compared to the Athena and other US green tools. [6].
- 5.b Holland for analysis of KPMG's new 40,000 m<sup>2</sup> Offices in Rotterdam compared to the Dutch developed GreenCalcs Tool, cradle to end of design life [7].
- 5.c Germany for analysis of a Residential Building in Germany cradle to site.

LCADesign's four International LCI databases were developed by CRCCI researchers in Australia. Each hold building industry supply chain data and calculate environmental results for domestic and imported products. They map supply chains throughout each domestic and key importer territory [8]. Each allows detailed assessment of building elements over the building life as well as energy and water used in operations [8, 9]. Each supports LCADesign applications and can also stand-alone for use by consultants on projects in those nations. Development of LCI for other territories is underway.

## 6 References:

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