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Architect's Don't need LCA

They just need to be hugged occasionally
Brian Murphy Architect by training
Environmental Specification Consultant by choice

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Sustainable Eco Green



Violet
Violent
Violate

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Shrinking Violet

- I used to be very good at being violet
- I have seen the light
- Now I am a shrinking violet
- A little green round the edges
- A little less violet everyday

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Much of the current legislation is simply a stop-gap solution

BRE
Add BRE tools to the above
GreenSpec
"Being less bad is no good"
William McDonough
Cradle 2 Cradle

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My Profession: I don't do that

- I used to be a Master builder
 - but I got bored with being on site
 - so left that to the Builders
- Then I got bored with working drawings
 - Technicians were invented
- I don't like writing specification
 - Specification consultant do that for me.
- Now I am expected to do environmental stuff,
 - thank goodness for the BRE/AM assessment
- I choose products because they look beautiful
 - my peers will love my work
- But I noticed recently that I am being forced to engage with material choices,
 - how tiresome.
- I just want to be an artiste, philosophe,
 - today I will design a shape of a.....
 - curve

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My clients

- Architects
 - I write their specifications
 - And try to educate them on environmental issues and stuff
- I will put myself in their shoes
 - For a moment
 - But wearing my hat

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British Library

- When I designed the British Library
- I chose hardwood for the exhibition hall,
 - 4 coats of acid catalyst lacquer,
 - to seal in the flavour and preserve the timber for an eternity
- Friends of the earth published that year
 - It turned out that Afrosia is an endangered species
 - so it's a good thing I stained it black
 - nobody will know
- and it was designed for 120 years,
 - who knows how long before its replaced.

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Hollywood

- When I designed the Scottish Parliament buildings
- I chose Scottish granite, Scotch pine & Douglas fir from local plantations.
- But I was not allowed to specify local,
 - failed to limit the specification to Europe
- ended up with Borneo hardwood
 - taken to America to be processed
 - to be delivered here.
- I learned their lesson
- I don't know if they did
- now I do what I can to be greener.

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'Architects don't need LCA:

- Designers and Specifiers going about their normal duties do not need LCA
- if they filtered out the bad stuff
- by judging ingredients, product and their application first'

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My new approach

- With so much greenwash in the marketing world
- I am in two minds most of the time
- But I am working out what I mean by
- 'Appropriate Competent Environmental Construction'
- And choosing materials to suit

GreenBookLive v Green

- BRE's Green Products Database
- lists many 100s PVC or Bitumen backed Carpets
- and PVC flooring
- and not much more
- I don't trust 'GreenBookLive-Green'

IAQ Indoor Air Quality v Green

- BRE's Green Guide to Specification
 - based on LCA
 - expressly excludes IAQ
 - indoor air quality
- I don't trust 'BRE-Green'

LCA Life Cycle Assessment v Green

- With BRE's Green Guide to Specification
- based on LCA
- telling me that PVC windows are good
- because PVC is recycled into garden gnomes and other stuff, but not recycled PVC in new windows,
- I don't trust 'BRE LCA-Green'

EPD Environmental Product Declaration v Green

- With BRE's EP Environmental Profiles
- expressly not addressing Toxicity
- I don't trust 'BRE EP-Green'

BREEAM v Green

- When I designed an extension to Aberystwyth University Arts Centre
- I wanted to use Timber construction
- BREEAM would not give me credits for timber construction in an education building
- If we used concrete we could get some credits, not many, but more than timber
- I don't trust 'BREEAM-Green'
- I choose Green Materials:
 - including timber
 - and mostly not concrete

Recycled Content v Green

- WRAP, BRE and ReMaDe
- Encourage us to specify recycled content building products
- because it diverted waste from landfill back into manufacturing.
- I discovered the binders are non-renewable petrochemical synthetic, sometimes formaldehyde and mostly not healthy,
- I don't trust 'WRAP-Green' or 'ReMaDe-Green'.
- I now check the binder is natural, plant based or avoid it.

CHIP, COSHH, CDM v Green

- I was lead to believe that legislation was driving out violet materials
- But I see no evidence of improvement
- They create HSDS and pass their responsibility to others to address
- I check the HSDS and avoid unhealthy materials in their application and in use
- But they say that some manufacturer did not think they had to list everything in HSDS

REACH & Green

- REACH looks like we have finally got some teeth?
- I can check the declared ingredients against the following lists and avoid them:
 - (160,000) ingredients in REACH list
 - (138) SVHC Substances of Very High Concern Candidate lists
 - (626) SIN List Substitute It Now lists
 - by Chemsec NGO <http://www.chemsec.org/>
 - <http://w3.chemsec.org>
 - ECHA CLP Annex VI
 - <http://echa.europa.eu/>
 - SubstPort SubstitutionPortal list
 - <http://www.subsport.eu>
 - RoHS (aimed at EEE but can apply to materials too)

ENVIRONMENT
European Commission | Environment | Chemicals | REACH

Home | Who's who | Policies | Integration | Funding | Law | Resources | News & Publications

Some Initiatives for Chemicals Management and Safety

Chemicals Health Monitor Project
<http://www.chemicalshealthmonitor.eu/>

The Chemicals Health Monitor Project is a project of the **Health and Environment Alliance** in collaboration with other partner organisations across Europe. The project will contribute to the tools and structures necessary so that important health stakeholders can understand the REACH "approach" and have their views about key decisions voiced. The project will also provide authoritative information (in a form accessible to the non-specialist public) to support measures to reduce harmful effects of hazardous chemicals on human health and the environment, and to choose safer alternatives.

Chemical Leasing Award
<http://www.chemicalleasing.com/uk/award/index.html>

Chemical Leasing is a service-oriented business model that shifts the focus from increasing sales volume of chemicals towards a value added approach. The product mainly sells the function performed by the chemical.

The Call for Submissions for the Chemical Leasing Award is open from September until December 2009. The award is jointly organised by the United Nations Industrial Development Organisation (UNIDO) and the Austrian Federal Ministry for Agriculture, Forestry, Environment and Water Management (BML/BW). The award has been announced at an ICCM 2 (2nd International Conference on Chemicals Management) side event in Geneva in May 2009. The first award ceremony will take place in 2010. The first prize winner in each category will receive prize money of USD 3,000. In addition, an honourable award will be given to the winners in each category.

ChemSec - SIN (Substitute It Now!) L1ST
<http://www.chemsec.org/>

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<http://www.ams6.eu/>

ChemSec
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Endocrine disrupting chemicals
L1ST moves from addition to subtraction: it is time to regulate the use of endocrine disrupting chemicals

Flame retardant HBCDD to be banned globally
HBCDD, a highly problematic persistent, bioaccumulative and toxic flame retardant, will be banned under the Stockholm convention, a global regime banning newly regulated the use of persistent organic pollutants (POPs). This was agreed by parties of the convention at a meeting in Geneva and of last week, and will be formally endorsed later this week.

Business dialogue
The art of balancing low-cost products

Endocrine disruptors
High concern chemicals in the property registered in the EU

Tools for investors
Avoid the financial risk related to hazardous chemicals

About the SIN L1ST
SIN Substances of Very High Concern to be substituted now

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SIN L1ST Database
CAS # SIN L1ST number

Search phrase:

Search filters:
Health & Environmental classification: EU EHC tags: Producer volume:

Search by CAS #
 Only search items: CAS# or EHC
Possible uses: Appearance data on SIN L1ST: Registration information:

Free search result | Search search results to PDF | Search search results to Excel | Search for display options

626 substances and substance groups were found.

CAS #	Name	Group	More info
1715-98-1	Nickel monoxide	Nickel monoxide	More info
11888-22-8	Nickel sulfide	Nickel sulfide	More info
34682-82-2	Nickel selenide	Nickel monoselenide	More info
12595-72-2	Tetraacetylfuran	Nickel dithiocarbamate	More info
12335-71-1	Hexachlorocyclopentadiene	Nickel dithiocarbamate	More info
18812-34-7	Nickel(II) selenide	Nickel sulfide	More info
11123-72-2	Nickel sulfide	Nickel sulfide	More info
1214-04-1	Nickel	Nickel sulfide	More info
17438-81-1	Lead	Lead compounds	More info
6677-64-1	Lead acetate	Lead compounds	More info
68811-58-8	Phthalic anhydride	Lead compounds	More info

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ECHA
European Chemicals Agency

About Us | Regulations | Addressing Chemicals of Concern | Information on Chemicals | Chemicals in our Life | Support

ECMA | Homepage

14 May 2013 - News alert
Final weeks before the 2013 registration deadline
ECHA invites the parties concerned to comment on two new proposals for harmonised classification and labelling (CLH) in relation to the registration deadline of 31 May 2013.

20 April 2013 - Press release
Public consultation launched on CLH proposals for two boranes and a peroxide
ECHA is seeking comments on harmonised classification and labelling (CLH) proposals for two boranes and a peroxide for registration. The public consultation will be open for 45 days and will end on 14 June 2013.

22 April 2013 - News alert
Classification on which to submit applications for the authorisation process
To further guide applicants through the authorisation process, ECHA has recently defined the term "Responsible" in Article 34(1)(2)(c) of the REACH Regulation regarding

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Deleterious Materials & Green

- I can check declared ingredients lists against the following and avoid them:
 - EWC European Waste Catalogue:**
*DS = Deleterious substances
http://www.nwcpo.ie/forms/EWC_code_book.pdf
 - Toxlist:**
<http://www.Toxlist.com>
 - Solicitor's 'Deleterious materials' lists in Contracts**
• *Yes they still keep doing it*

epa

EUROPEAN WASTE CATALOGUE AND HAZARDOUS WASTE LIST

30 - WASTE IDENTIFICATION CODES*

08 - WASTES FROM THE USE OF PAINTS, VARNISHES, VITREOUS ENAMELS, ADHESIVES AND SEALANTS*

08 01 - WASTES FROM REMOVAL AND USE OF PAINT AND VARNISH*

08 01 11 - waste paint and varnish containing organic solvents or other DS*

08 01 12 - waste paint and varnish other than those mentioned in 08 01 11*

08 01 13 - sludges from paint for varnish containing organic solvents or other DS*

08 01 14 - sludges from paint or varnish other than those mentioned in 08 01 13*

08 01 15 - aqueous sludges containing paint or varnish containing organic solvents or other DS*

08 01 16 - aqueous sludges containing paint or varnish other than those mentioned in 08 01 15*

08 01 17 - wastes from paint or varnish removal containing organic solvents or other DS*

08 01 18 - wastes from paint or varnish removal other than those mentioned in 08 01 17*

08 01 19 - aqueous suspensions containing paint or varnish containing organic solvents or other DS*

08 01 20 - aqueous suspensions containing paint or varnish other than those mentioned in 08 01 19*

08 01 21* - waste paint or varnish remover*

08 01 09 - wastes not otherwise specified*

08 04 - WASTES FROM USE OF ADHESIVES AND SEALANTS (INCLUDING WATERPROOFING PRODUCTS)

08 04 09* - waste adhesives and sealants containing organic solvents or other DS*

08 04 10 - waste adhesives and sealants other than those mentioned in 08 04 09*

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ToxList

Search other databases:

Useful links
Disclaimer
Privacy Policy

The EU Toxlist data base

Introduction
Any product, such as a building material or a toy, can be considered as a mixture of its chemical components. It is of course not entirely fair to make a product identical to its chemical components, since these will usually be bound together in a matrix (the product), but on the other hand these chemical substances do lead to direct workers exposure during production, can leak from the product over its lifetime and may pose an end-of-life (waste) issue. All discussions regarding the presence of certain chemicals in products, and the need for substitution of the harmful ones, are based on considering products as a mixture of chemical substances without worrying too much whether they are bound in a matrix or not.

The data base
The data base behind the search engine contains all peer reviewed chemical substances with their names, synonyms, EC number, CAS number, hazard statements and a flag. Both human and environmental toxicity are covered.

The flags are:
Black: must not be used and should be substituted
Red: use should be limited as much as possible and prevented if possible
Orange: use with care
Green: okay to use until further notice

For the time being **GreenSpec 2013 BrianMurphy** orange and green flag chemicals, since for those no peer reviewed classifications exist yet. Their review process is currently ongoing. The data base will be updated as soon as their harmonised classifications become available.

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Appropriate Competent Environmental Construction

- Physics of building >
 - Science of materials >
 - Competent Construction
- Understanding the performance requirement of the element of the building
 - The right property(ies) for the application
 - The correct sequence of components in the element
- Understanding the properties of the materials
 - The right material(s) for the application
 - Compatibility of materials
- The right product(s) for the application

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Environmental

- Its not just about
 - Energy
 - carbon
- Its also about
 - healthy
 - reducing other emissions/impacts
 - resource efficiency: all aspects
 - Positive attributes more than negatives
- And Sustainable
 - +Social +Corporate +Economic
- Its also about 400 issues that bother me
- 400 so far....
- everyday I add to the list

We need step-changes

- We need rapid changes in behaviour
- We need good easy to use guidance
- We need to have confidence in it
 - to be able to trust it
- It needs to facilitate change
 - And not to discourage
- It needs to look at materials first
 - and then look at them in the context of construction
 - 'Appropriate competent environmental construction' assemblies
 - that we may still be unfamiliar with
 - To give us confidence to go there

Architect's Basic needs:

- **Basic Product Information**
 - Advantages/Disadvantages
 - Right or wrong for project to enable short listing
- **Avoidance of Liability**
 - Appropriate Competent Environmental Construction Assemblies
 - All the parts, like each other
 - In the right order, to do their job
- **Complying with:**
 - Building & Environmental Regulations
 - Cited (Euro) Code of Practice & Standards
 - Manufacturer's recommendations and requirements
 - BBA National Agreement Certificate requirements
 - Industry Best Practice

Architect's basic wants:

- **Application Specification**
 - For contract documents
- **CAD files of assemblies or products**
- **Eco-System/Label with quick overview**
 - Positive attributes taken into account
 - Not just least negative impacts
 - Results compare well with gut instinct
 - Confidence in the system/label
- **Eco scores for materials/products**
 - Enable unique assembly/building scores
 - Do own MS Excel calculations instantly

If interested in more:

- Access to the data source
- Ability to interpolate between results
- Comprehensive declaration of content of substances
- Comprehensive list of issues addressed
- LCA Life Cycle Assessment
- EPD Environmental Product Declaration

Buildings > Elements > Materials


Deconstruction & Reconstruction

- I consider each individual part
- Just like a specifier
- I do not ignore any part of the whole, accessories, etc.
- I look at all issues and try to find greener products for every part
- If you can make an environmental choice in all parts, why wouldn't you?
- I then look at them in elemental assemblies & then in buildings
- I aim to promote 'appropriate, competent environmental assemblies' and avoid compromising materials within their assembly

Traffic Light Systems

- When you put all the issues on a traffic light system it's actually very useful in order to make a decision
 - BDP have done something similar for interior design products
 - Ska uses a screening system for office fit-outs which includes: does it have an EPD?
 - OneEcoHome website had one but the site and shop is closed, until better times perhaps.
 - Betternest are developing a sustainability easy screening system for refurbishment, finding ways to make it lightweight to use.

Top Trumps



- A card game where the players choose between characteristics hoping to find one that is higher scoring than their opponent
- **The same game that manufacturers play in advertising**
 - Promoting only one characteristic over all others
- LCA & low price is also used by D&B Contractors to choose products,
 - with little consideration for other performance characteristics or environmental criteria

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fibre fibre cement profile sheeting from Steadmans is recognised as a superior alternative to asbestos cement roofing and is:

- Highly cost effective weatherproofing
- An environmentally friendly asbestos-free, reinforced fibre cement sheet
- Virtually maintenance free
- Resistant to chemical attack, rust, rot and corrosion
- Non-toxic
- Available in a range of painted colours
- Manufactured to meet British and European building standards
- BBA approved

In addition, the fibre cement profile sheeting:


- Requires no special precautions
- Has excellent noise and thermal insulation properties
- Is available with a 30 year guarantee (on request)

ENVIRONMENTAL ASBESTOS-FREE
MARLEY Eternit



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Asbestos-free



- **Asbestos** fibres have been banned from manufacture of fibre cement materials for some considerable time, at least in this part of the world.
- And if the manufacturer has any morals, they should not be part of manufacture in any other part of the world, where it may be permitted.
- E.g. Asbestos was recently reported to be the latest great thermal insulation promoted in Eastern Europe.
- There is no asbestos fibre based cement products in our market so asbestos-free is not a differentiator.
- its not an environmental improvement over normal practice.
- Its a health improvement over historic normal practice that was later determined to be bad practice.


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Level Playing Field?

- LCA provides an opportunity for comparison of all materials on an equal basis
- LCA and EPD are done for any product
- Creating a level playing field
- But only if all materials are considered
- And only if all are compared on an equal basis
- Its unfair comparison to only have one team on the pitch
- If one team is missing the other team look very good on their own

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Screening Traffic Light System



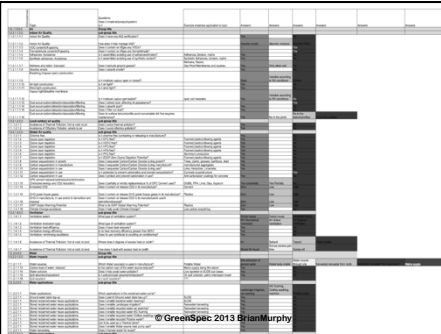
- 400 issues currently addressed
- Does the material engage with the issue?
- Yes = Green, Neutral = Amber, No = Red
- Is the issue applicable to the material?
- Applicable = Green, Not = Red
- This helps to find and highlight the best

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Screening advantages:


- Easy: Yes = Green, No = Red
- Progressive Assessment Hierarchy
 - Default scores established
 - Product and Project scores to add
- No experts needed
 - architects can do this
- Low expense (no LCA fees)
- Bespoke assemblies possible:
 - By the architect
- Whole buildings possible:
 - By the architect

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
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LCA Life Cycle Assessment



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LCA Life Cycle Assessment

- Having gone through a screening process you end up with a shortlist
- Then you can compare the results of LCA of your choice(s) to pick the one from a shortlist
- For this reason GreenSpec and 10 organisations in EU (NWE) are developing a low cost LCA to support our offering.
-  CAP'EM

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LCA Strength/Weaknesses

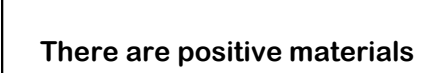
- LCAs are good in concept
 - Good solid number crunching
- but done wrong (with bias or inconsistency) OR
- buried under weighting systems OR
- missing the best (Greenest) products
- = no improvements
- = business as usual,
- and a barrier to trade
 - for those not in the club
 - More on this later



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LCA limitations


- LCA studies and scores negative impacts of manufacture, use and disposal of materials and products
- LCA does not look at positives impacts of manufacture use and reuse of materials since there are very few in normal build



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LCA & Carbon Sequestration

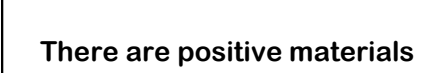
- LCA does not normally look at carbon sequestration during the growing stage
- LCA of Bio-based products should have the benefit of Carbon Sequestration in the assessments
- PAS 2050 has guidance on its inclusion
- LCA with carbon sequestration will give well rounded results



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LCA Green or Violet?


- LCA can find the greenest of the green materials
- LCA can help to find the least violet
- If Green materials are missing
 - LCA finds the least violet of the violets
 - Users might assume they are greenest
 - Especially if the Cover says so
- If the Greens are present?
 - LCA will sort the greens from the violets



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Beyond LCA


- Impacts also include the Building process itself:
 - construction, maintenance, refurbishment, etc
 - This is beginning to be considered by LCA practitioners
- Monetisation of LCA outputs being considered in Belgium
 - So worsening of impacts can be considered when material substitutions occur
 - And costs of impacts taken into account
 - On Polluter pays principle



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Less bad is not good enough

- Design is a constructive process
- Designers need info on good materials
- Designers are looking for positive outcomes
- They can and do engage in positive environmental design
- They want credits for positive design
- not just credits for less bad materials
- LCA alone can not deliver this



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- Using LCA alone
- will result in decisions akin to laying a crazy paving play field because it was the cheapest one in a catalogue
- It's obviously the wrong catalogue
- our children want on play on a lawn.



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There are positive materials


- But under LCA as they are today
- these positive materials often look bad
 - or less bad than other materials
- E.g. Taking Carbon sequestration into account
- Materials can be:
 - Low Carbon
 - Carbon neutral
 - Carbon negative
- But LCA will not normally show this



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EPD

Environmental Product Declaration



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LCA Good : EPD bad


- LCA is good solid
 - Science & number crunching
- I can live with that
- Does Allocation undermine LCA's credibility?
 - select the system that works best for your product on the day of the assessment
- Not sure I can live with that
- EPD is
 - future gazing, guesswork, assumptions
- I am expected to live with that
- I have no choice

EPD Environmental Product Declaration

- An EPD is a statement of facts about the product or material, about its manufacturing processes in the period of the assessment,
- the company pays for the assessment to be carried out by an LCA/EPD specialist.
- All EPD methodology should ideally be consistent and comparable but often are not,
 - there are many variables including Product Category Rules, Declared Unit, System Boundaries, Allocations, etc.

EPD Environmental Product Declaration

- EPD is the outcome of LCA + a bit more
- EPD is a declaration of negative environmental impacts in the creation of a product or a material;
- EPD is the summing up of the negative impacts of all the processes from extraction to packaging and is often but not always based on Cradle to Grave.
- End of life to Grave or second life is optional



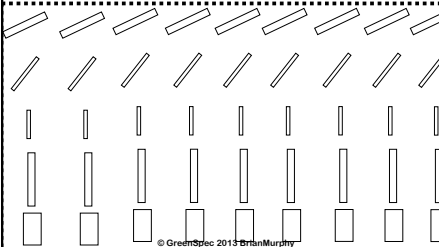
- EPDs could be brilliant
- they could put all the info you want to compare in one place
- without any weightings, etc.
- but due to their infancy there is still currently a lack of prescribed method of assessment and presentation
- But in 3 years there will be

Limitations of an EPD

- EPD is not:
 - a badge of honour,
 - a green label,
 - certificate of compliance
 - an endorsement
- Having an EPD should not be a criteria for acceptance,
 - only a means for comparison,
 - however their content may not be comparable for some time yet.

LCA & EPD

Dark green, light green & violet

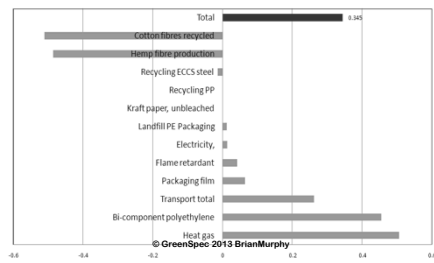



EPD & Marginal Analysis

- An EPC might raise awareness
 - manufacturer may use its results to help them identify problem ingredients,
 - find substitution materials to improve the product,
- Marginal Analysis shows which resource material have the greatest share of the impacts.
- The improved product will need a new EPD.

Marginal Analysis (Dr. A Norton)

Where do the impacts come from?

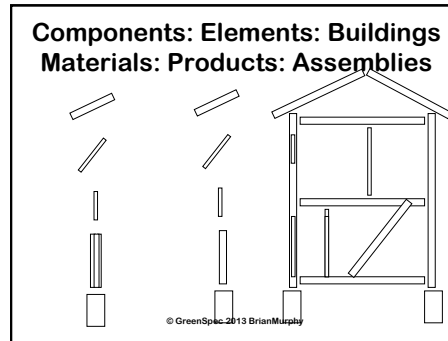



Moving Targets

- LCAs by different organisation, or with differing Product Category Rules, System Boundaries, Cradle to , result in incomparable LCA results.
- Compliance with ISO 14025 does not reduce the variability.
- CEN TC 350 aims to standardise LCA
 - Relate to CE marking & Essential Requirements
- EU Consumer Council challenged TC 350 not to favour manufacturers and to engage with human and societal issues or they would tell consumers to ignore LCA
 - CEN TC 350 was being revised
 - CEN TC 351 is engaging with issues of health but sidestepped manufacturing (the result of industry lobbying?)
 - CEN TC 350 will need to embrace CEN TC 351 in due course
- All LCA will have to monitor CEN TCs and update at each revision
- Manufactures LCAs need updating at great expense
- Consumers than have to check the date of the LCA and if they include all the latest revisions
- EU pronounced its methods to be adopted within 3 years
- CEN TC 350 will be leapfrogged but slowly



Assemblies of components & Elements




Assemblies

- We need to consider how materials are promoted and used in any permutation:
 - Green materials in green assemblies
 - Green materials in violet assemblies
 - Violet materials in green assemblies
 - Violet materials in violet assemblies
- GreenSpecSTUDIO is moving towards screening out the worst combinations to assist with the step changes needed to solve our current problems

Future of LCA & EPD?

- At the moment Architects will continue to make beautiful buildings
- The contractors will substitute the worst materials
- If we go down the route of monetisation of LCA & EPD results
- This could make LCA & EPD useful
- We can make the polluter pay
- But the work involved is immense and slow
- We could become the best documented demise of a civilisation on record
- With nobody left to enjoy the architecture

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- Brian Murphy BSc Dip Arch (Hons+Dist)
- Architect by Training
- Specification Writer by Choice
- Greening up my act since 1999
- Founder of www.greenspec.co.uk
- www.greenspecdownload.co.uk
- E BrianSpecMan@aol.com
- Twitter: <http://twitter.com/brianspecman>
- Scribd: www.scribd.com/brianspecman
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