LCA for a robust ecodesign approach?

Véronique Andriès, Ecodesign Director

05 Novembre 2015
A leading position in rail transport

**Trains**
- Tram, metro, suburban/regional, high speed, very high speed, locomotive
- Components: traction, bogie, motor
  - 45%

**Services**
- Maintenance
- Modernisation
- Spare parts, repairs & overhaul
- Support services
  - 23%

**Signalling**
- Signalling solutions portfolio for:
  - Main lines
  - Urban
  - Control and security
- Sold as products or solutions
  - 20%

**Systems**
- Integrated solutions
- Infrastructure
  - 12%

A group with annual sales of over €6 billion

Note: all figures including the signalling activity recently acquired from General Electric
Life Cycle Assessment?

Sample of questions that raised: limiting the use?
- How much is it? (Mgt T&P)
- Needs & Benefits for business? (Mgt)
- Accuracy? Where are the limit when modelling the life cycle? Where are the limit of interpretation?
- An expert method?
- …

For doing what? Objectives?
- Environmental Footprint (A)
- Comparison of 2 products, solutions, services (A and C)
- Environmental Hot spots (CI)

“Verbatim”

«How many hours do you need?» Tender leader

«On nous dit que l’éco-conception coûte cher»
Ingénieur Eco-conception

«A quoi ça sert?» Sales Manager

«Je voudrai une EPD dans 2 semaine»
Marketing manager

«it’s too complex!!! nobody cares» Engineering Management

«energy efficiency is enough to promote our performance» Technical Management

“On a besoin démontrer qu'on a amélioré les performances d’une génération à l'autre. Pas évident de le mettre en évidence” Expert Eco-conception
LCA Alstom experience & practices

- Ecodesign Expert & Engineers: ~ 25% – 25% with good LCA skills
- Software –DBB: EIME
- Number of LCA (with report)

<table>
<thead>
<tr>
<th>Year</th>
<th>LCA Reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>14</td>
</tr>
<tr>
<td>2013</td>
<td>20</td>
</tr>
<tr>
<td>2014</td>
<td>80</td>
</tr>
</tbody>
</table>

- Various scopes and objectives: examples
  - Components for Trains or Signalling:
    - Traction components
    - Auxiliary converter
    - Floor covering
    - ...
  
  ![Life Cycle Assessment Graph]

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td>Air Acidification</td>
</tr>
<tr>
<td>AT</td>
<td>Air toxicity</td>
</tr>
<tr>
<td>ED</td>
<td>Energy depletion</td>
</tr>
<tr>
<td>EP</td>
<td>Eutrophication</td>
</tr>
<tr>
<td>GWP</td>
<td>Global Warming Potential</td>
</tr>
<tr>
<td>HWP</td>
<td>Hazardous waste production</td>
</tr>
<tr>
<td>ODP</td>
<td>Ozone layer depletion</td>
</tr>
<tr>
<td>POCP</td>
<td>Photochemical Ozone Creation</td>
</tr>
<tr>
<td>RMD</td>
<td>Raw Material Depletion</td>
</tr>
<tr>
<td>WD</td>
<td>Water depletion</td>
</tr>
<tr>
<td>WT</td>
<td>Water toxicity</td>
</tr>
</tbody>
</table>

© ALSTOM SA, 2015. All rights reserved. Information contained in this document is indicative only. No representation or warranty is given or should be relied on that it is complete or correct or will apply to any particular project. This will depend on the technical and commercial circumstances. It is provided without liability and is subject to change without notice. Reproduction, use or disclosure to third parties, without express written authorisation, is strictly prohibited.
LCA Alstom experience & practices

- Various scopes and objectives: examples
  - Bogies
  - Signalling components

![Diagram showing life cycle assessment of various components]

-30%
LCA Alstom experience & practices

- Various scopes and objectives: examples
  - Rolling Stocks
LCA Alstom experience & practices

- Various scopes and objectives: examples
  - Infrastructure components
    - Catenary, APS
LCA Alstom experience & practices

- ISO 14021 - ISO 14025 environmental product declaration
  - Rolling Stocks: EPD® Programme
  - Electrical & Electronics components: PEP Ecopassport
LCA Alstom experience & practices

- LCA as pillar of our environmental assessment methodology

IMPACTS : LCA & Others

ROOT CAUSES

GENERIC ASPECTS

- Energy Losses PCB xxx
- Use of Zamak alloys
- ...

- Energy consumption/Losses
- Material use/hazard. Subst.
- Noise
- ...

RECONCILIATION

- Customer requirements
- Marketing
- Regulations
- Efficiency

PRIORITIES

ACTION PLAN DESIGN PROVISIONS

• Customer requirements
• Marketing
• Regulations
• Efficiency
LCA Alstom experience & practices

- Our learning curve

- Pilot studies. Footprint calculation
- Start usage on projects
- Start usage for environmental improvement
- Assessment methodology for continuous improvement

Maturity

Our take away…. 

- LCA
  - is very useful if clear objectives are fixed
  - Is sometimes hazardous. It always depends on assumptions, their relevance, and interpretation…“use” needs a minimum maturity level
  - Is not enough to cover environmental topics of concern
  - Is time consuming !
  - Is a good tool to not miss something : a way to handle Life Cycle Thinking !
  - Is powerful to identify improvement leverage
Our take away….

- LCA is a good path for robust ecodesign approach:
  - a way to handle Life Cycle Thinking identifying improvement leverage
  - As a basis determining priorities
  - Continuous Improvement LCA

- Communication towards internal stakeholders is necessary: *speak with data*
Conclusion

“Good application of the environmental analysis of the product covering the complete life cycle of the product” external auditor – ISO14001

Good set of tools for ecodesign (check-list aligned with DQF gate reviews, technical choice matrix, EIME…), external auditor IRIS

«Merci beaucoup pour ce travail essentiel. » Direction développement commercial

«C’est trop top, au moins c’est concret…. » Marketing Manager