

Airbus DS LCA return of experience

Lessons learnt and recommendations from the application of LCA to space products

DEFENCE AND SPACE

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12 October 2022

Agenda

- Base for Return of Experience
- Progress review (*against ESA CSID 2021*)
 - *Methodology*
 - *Harmonization*
 - *Tool / Databases*
 - *Other aspects*
- LCA and other environmental assessments

Base for Return on Experience

ITT/ Bids, Phases 0-A / A-B1, Phases B2-E1, Technologies

- Earth Explorer – SKIM/FORUM ✓
- COPERNICUS – GPLF EO Standard Platform ✓
- COPERNICUS HPCM ▶
- Galileo 2nd Generation ▶

- Own LCA on Space Technologies ▶

Methodology



ESA LCA Guidelines

- Definition of important methodological elements in the Guidelines or latest in the ITT SoW/SRD
Cut off criteria, Data Quality Ranking or other major methodological elements have to be set earlier, as they strongly influence the amount of work and the contractualisation with suppliers
- Change of LCIA methods
We should avoid that the Guidelines are constantly outdated and need constant updating. Potentially the methods could be set in the ITT or have to be agreed in the Tailoring
- Prime and Equipment LCA activities
The level of details and other aspects on the link between Prime and Equipment LCA are not explicit enough (§7.2.2.2.1 and §7.3)
- Priority impacts
*The 6 priority impacts defined by ESA are contributing positively to embedding LCA in projects/programs
Priority impacts could be included into the guidelines and advertised*



▶ Ongoing activity by ESA

tackled by the ESA LCA Handbook update

Harmonization



Data collection

- General Approach - Updating existing documentation vs. Dedicated documentation
Some existing documents (i.e DML, DPL...) are already containing needed data, but not all necessary. Do we change the ECSS standards or create new format
- Harmonisation of documentation (i.e. LCA questionnaire)
All Primes have different LCA questionnaires, this will create confusion and additional work/costs

Requirements

- Harmonisation of requirements, especially for the same Phases
LCA requirements are different → Galileo ≠ Copernicus HPCM



↑ Fast reaction by ESA on harmonisation of LCA questionnaire

! Still relevant to improve in standard complementary approaches for data collection at supplier level – DML, DPL.

↑ FORUM and Harmony have same the same requirement as Copernicus HPCM

Tool / Databases



ESA Database

- Strong and available database

Early Phases / Preliminary LCA are completely dependent on an existing strong database. At System PDR, LCA relies only on existing data (ESA database, existing company database, commercial database) as most suppliers are not yet contractualised

LCA tools

- Different tools, different databases and versions

*How to ensure compatibility between GaBi, SimaPro or other LCA tools?
How to manage (major) Tool/database version change in long projects?*



▶ Ongoing activity by
ESA

*Tackled by the ongoing
ESA LCA DB project
and in particular the data
converter*



Others Aspects ^(1/2)



Global

- Clarification of the purpose of LCA

External Communication, internal awareness, Ecodesign, filling LCA database...

The purpose is defining more precisely the need in term of effort and quality. Is an uncertainty

Analysis necessary for all purposes?

- Clarification of the importance of LCA for ESA

This does influences if the subject is taken seriously or as a nice to have

LCA for one satellite might be less strategic than on another one

LCA level

- Material and manufacturing processes LCA

Increased value (accuracy , reuse) for Space specific technology/material/processes

Deeper cooperation with a specific supplier than with 50, allowing more accurate data and launching dedicated improvements

Others Aspects (2/2)



LCA results

- Usefulness to share (some) results with suppliers and projects members
 - Stakeholders contributing to the LCA should be made aware of the results and recommendations*
 - In particular suppliers without LCA capacity (strong majority) might be more willing to contribute and launch improvements based on results*

LCA deliverables

- Mismatch between document delivery and data availability
 - 1st LCA iteration at System PDR means that most suppliers are not contractualised and therefore so no (new) data are available*
- LCA with changing design / model philosophy
 - Before System/Instrument/Equipment CDR, design are not frozen and changes have to be modelised in the LCA software causing constant modifications*



! Important to define timeline of the deliverables in line with the the purpose of the study

Other new aspects

- ❑ Optimise data collection performed for LCA to feed into Scope 3 assessment at company level.
- ❑ Promote environmental assessment « literacy » at different industry levels - together.

Thank you

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