

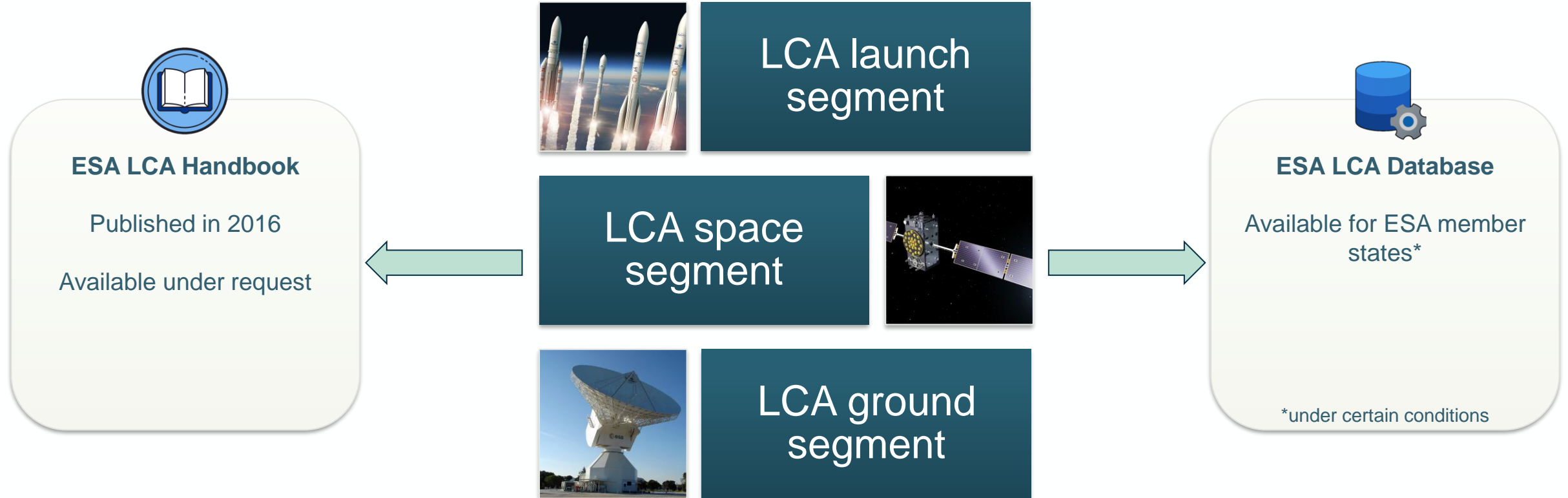
ESA LCA Database

ESA Clean Space – Ecodesign Team

17/10/2023

ESA UNCLASSIFIED – For ESA Official Use Only





ESA LCA database (2016):

- To compile space specific materials, processes, propellants and equipment
- **Note:** Based on literature review and public information

ESA LCA database (2019):

- Alignment and integration of datasets coming from ESA contracts and missions, done between 2016 and 2019
- Update structure of database (datasets re-organized in different categories)
- Development of an external and internal Databases to protect proprietary information
- Development of user manuals for database and new datasets

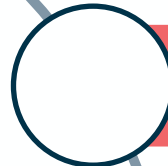
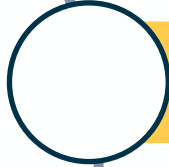
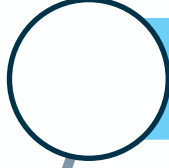

ESA LCA database (on-going):

ESA wants to provide an up-to-date tool to facilitate and support the LCA activities by European Space stakeholders.

ESA LCA Database update activity - Objectives

This activity aims to improve the effective use and maintainability of the ESA LCA Database.

The objectives of this activity are:

-  Define a methodology for **improvement, update** and **maintenance**
-  **Improve** and **validate** the database
-  **Maintain the database updated** taking into consideration new datasets coming from ESA contracts and other sources
-  **Develop tools to facilitate its usage and distribution** among ESA and European stakeholders

ESA LCA Database – New version release

Updated version of the ESA LCA Database ready to be shared through the Space Debris User Portal:

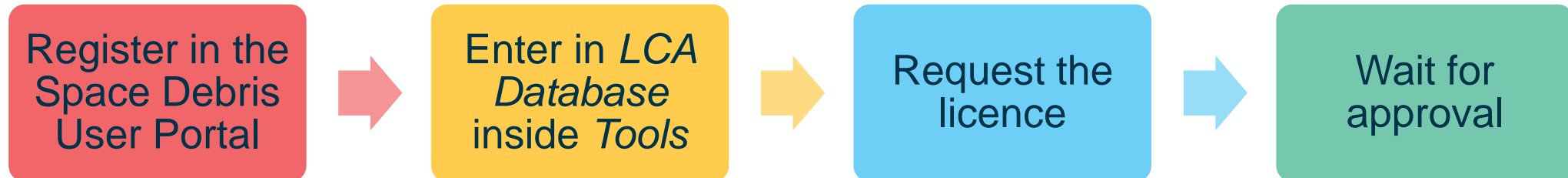
<https://sdup.esoc.esa.int/>

- ❑ Available in both SimaPro and openLCA (open-source) software.
- ❑ Public User Manual is also shared through this portal.
- ❑ New datasets included (System level testing datasets, germanium wafer, electronics)

Requirements the user must meet:

- ✓ Being from ESA Member States
- ✓ Having a validecoinvent licence

To be able to download the ESA LCA Database, the user will need to follow some steps:



1) Register in the Space Debris User Portal



Registration Form

Full name

Association

Email address

Password

Confirm password

Phone number

Numbers should include a country calling code.

Full address

Country

I understand and accept [ESA's privacy policy](#)

I understand and accept the [General Terms and Conditions](#)



2) Enter in *LCA Database* inside *Tools*

ESA LCA Database

- DRAMA
- MASTER
- ORIUNDO
- PROOF
- SOLMAG
- LCA Database

To access LCA downloads, please **request the licence**. Licences are approved after review.

The aim of the ESA LCA Database is to enable space programs to assess their environmental impacts through the Life Cycle Assessment (LCA) methodology in accordance with international LCA requirements (ISO 14000/14044). This database accompanies ESA LCA Handbook (ESSB-HB-U-005), which provides guidelines for users on how to conduct a LCA in the space sector.

The first version of the ESA LCA Database was created in 2016. This first version of the database contained space specific datasets including specific materials, processes and equipment. This database was updated between 2019 and 2020 to include also datasets coming from previous ESA projects. Nowadays, an ESA contract is ongoing to continuously maintain and update the ESA LCA Database.

The goal of this webpage is to make the ESA LCA Database available to all ESA Member States stakeholders to support them in future LCA studies. The database is available for different LCA software and for different systems.

The ESA LCA Database has been developed by Clean Space under contract of the European Space Agency (ESA) and by ESA directly. The Clean Space initiative started in 2012 and its objective is to guarantee the future of space activities while protecting the environment (both Earth and space).

The following partners have been involved in the development of the ESA LCA Database:

- Asplan Viak
- Norwegian University of Science and Technology, NTNU
- DEIMOS Space SRL - Romania

Clean Space contact details:

- Clean Space blog: <https://blogs.esa.int/cleanspace/>
- Clean Space Email: cleanspace@esa.int



3) Request the licence

ESA LCA Database

Home Downloads

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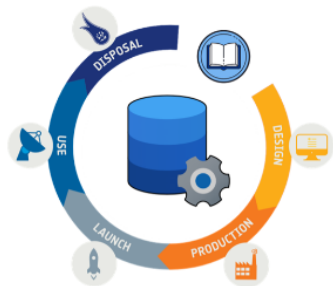
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Data to be provided to request the licence:

Ecoinvent username

Ecoinvent email address

Please enter the email address associated with your ecoinvent account.

Purpose of the ESA LCA Database use

In addition, it is needed to accept:

- ESA LCA Database Licence Agreement
- Data privacy notice document

4) Wait for approval

ESA checks if the user belongs to ESA Member states

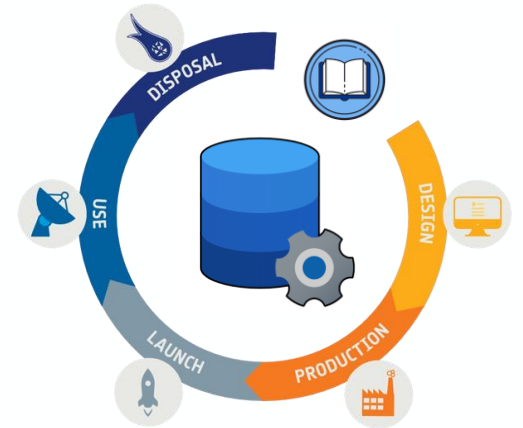
Ecoinvent checks if the user has a valid licence of ecoinvent (currently ecoinvent 3.9.1 is needed)

ESA grants or rejects the user rights to access ESA LCA Database downloads

If the licence is approved, the user has access to the ESA LCA Database, as well as the Public User Manual or other documentation that is released by ESA



- ❑ ESA wants to provide an up-to-date tool to facilitate and support the LCA activities by European Space stakeholders
- ❑ ESA LCA Database is crucial to assess the environmental impacts of space missions and to perform ecodesign
- ❑ Updated version of ESA LCA Database ready to be shared through the Space Debris Portal:
<https://sdup.esoc.esa.int/>
- ❑ Future updates are foreseen
- ❑ **The ESA LCA Database needs your help!**



Thanks for your attention!
