ESA LCA DB Evolution

ESA LCA DB Team

CSID, 09th October 2024

Agenda

1. Overview
2. Updates
3. Generic Datasets – 2024 Targets
4. Questions

ESA LCA DB Evolution
Project Scope, Team and Presenters

deimos

Suzana Vladescu

RINA

Elena Rocco

GreenDeLTa

University of Strathclyde Glasgow

EVERSIS

Project Scope

build, consolidate and maintain an operational and up-to-date environmental LCA database and **provide support services** to the ESA LCA Database end-users.

ESA LCA DB Evolution

Add Datasets (existing projects)

Ground Segment with improvements

Ground Station with improvements

ESA LCA DB External v1.3.0

(loading)

Create new datasets

Office Work at ESA

Generic datasets

Scalable datasets

Fix

AI Billet

cut-off modelling corrections

Documentation

User Manual update

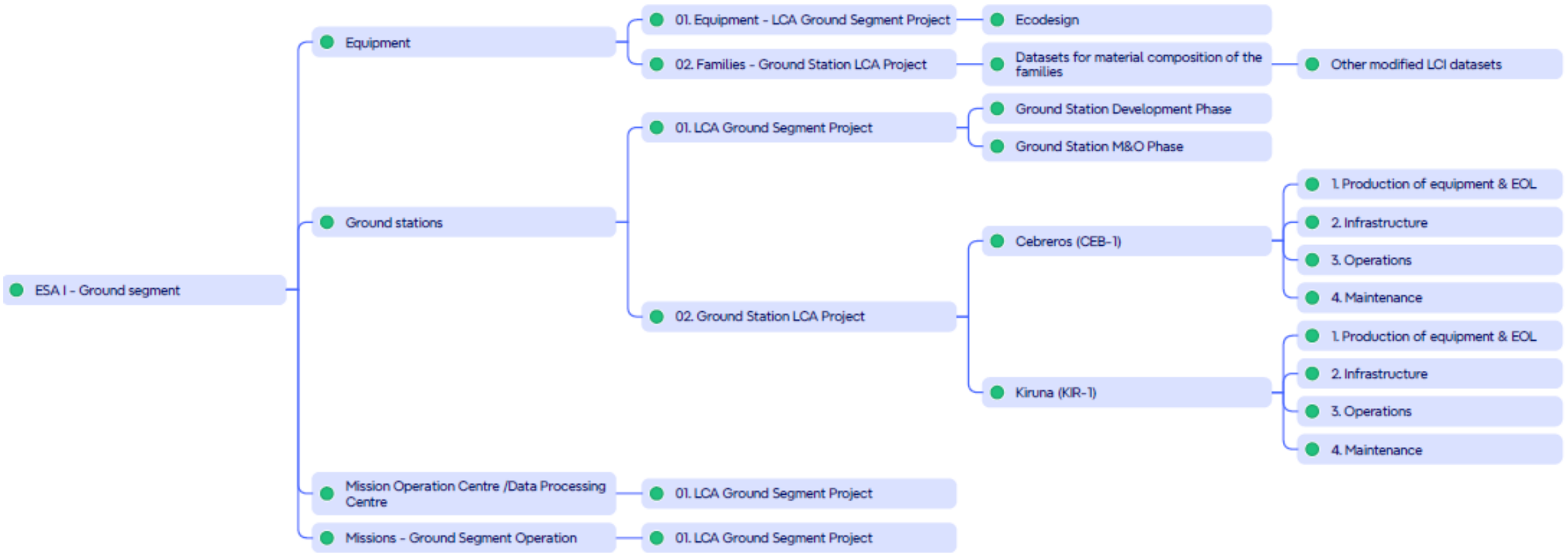
Generic dataset – procedure evolution

Scalable dataset procedure

- A total of **273 datasets** related to the **Ground segment** and **Ground stations** have been incorporated into the External version of the database, specifically within the designated ESA I – Ground segment section.
- These datasets originate from the following projects:

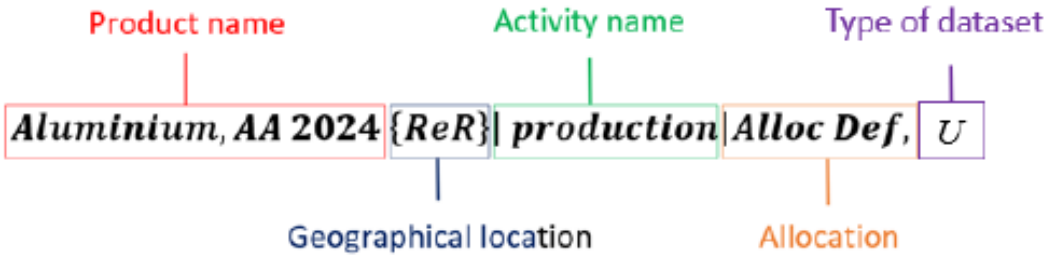
  - Ground station project (ESA Contract No. 4000129230/19/D/SR), conducted by Deloitte (2019-2021)
  - Ground segment project (ESA Contract No. 4000123991/18/NL/GLC/as), undertaken by RINA (2018-2020)

ESA LCA DB Evolution
Inclusion of Ground Station and Ground Segment data



Respect to their original version, the datasets have been slightly modified:

- **Name update**, adapting them to the ESA nomenclature conventions.



- **New comments** added in the comment section, following the structure:

  - Functional unit
  - Process description
  - Project description
  - NOTE (a disclaimer on the project)
  - LCA practitioner
  - Copyright statement
  - Update statement

- NOTE (a disclaimer on the project)
  - The **LCA Ground Segment** project is intended to be used to estimate the overall impacts of several ground segment systems used in a space mission, or to evaluate the impacts of single equipment parts. When used in new studies, this information should be carefully selected on a case-by-case basis. More in depth information on the environmental impacts of ground stations is provided by the datasets of the Ground Station LCA project.
  - The **Ground Station LCA project** analyses in depth the environmental impacts of ground stations and their equipment. This study complements the LCA Ground Segment project, in which the impacts of all ground segment systems is estimated.

- New datasets have been developed to represent office work at ESA, covering the following offices:
  - ESTEC - Netherlands (NL)
  - ESOC - Germany (DE)
  - ESRIN - Italy (IT)
  - ESAC - Spain (ES)
  - HQ - France (FR)
  - ESEC - Belgique (BE)
  - ECSAT - UK
  - EAC - Germany (DE)

- The datasets represents the office work consumptions for the ESA offices, for 1 man hour.

- The reference year for data collection is 2022.

- The consumption mix for the office work in ESA sites includes:
  - **Electricity** (from grid and on-site produced);
  - **Heat** (from renewable and non-renewable sources);
  - **Fuels** (for diesels generators and hot water furnaces);
  - **Water use** (potable, non-potable and bottled).

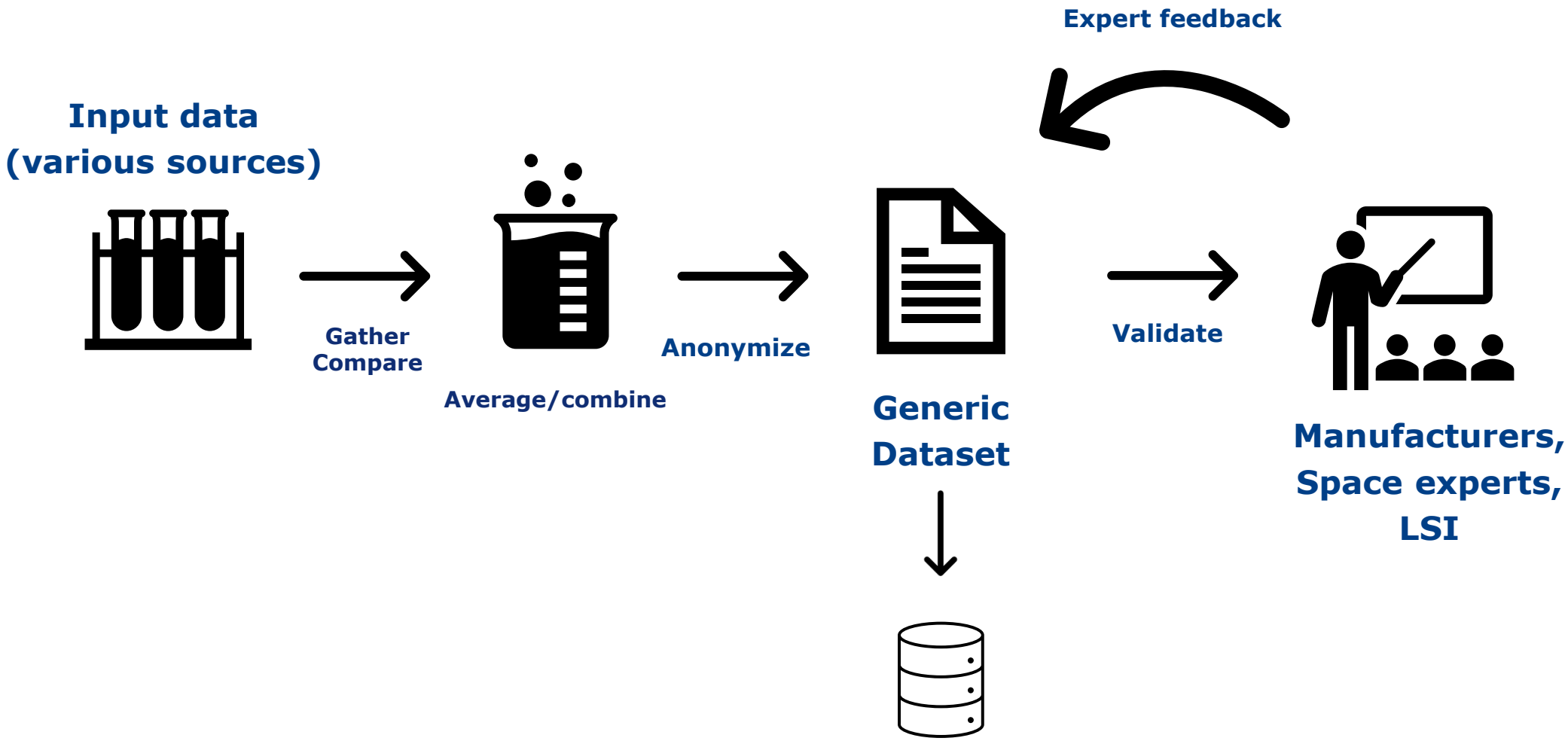
- The datasets have been included under the folder ESA II – Manpower & travels – ESA_office work_2022.

ESA LCA DB Evolution
Generic datasets

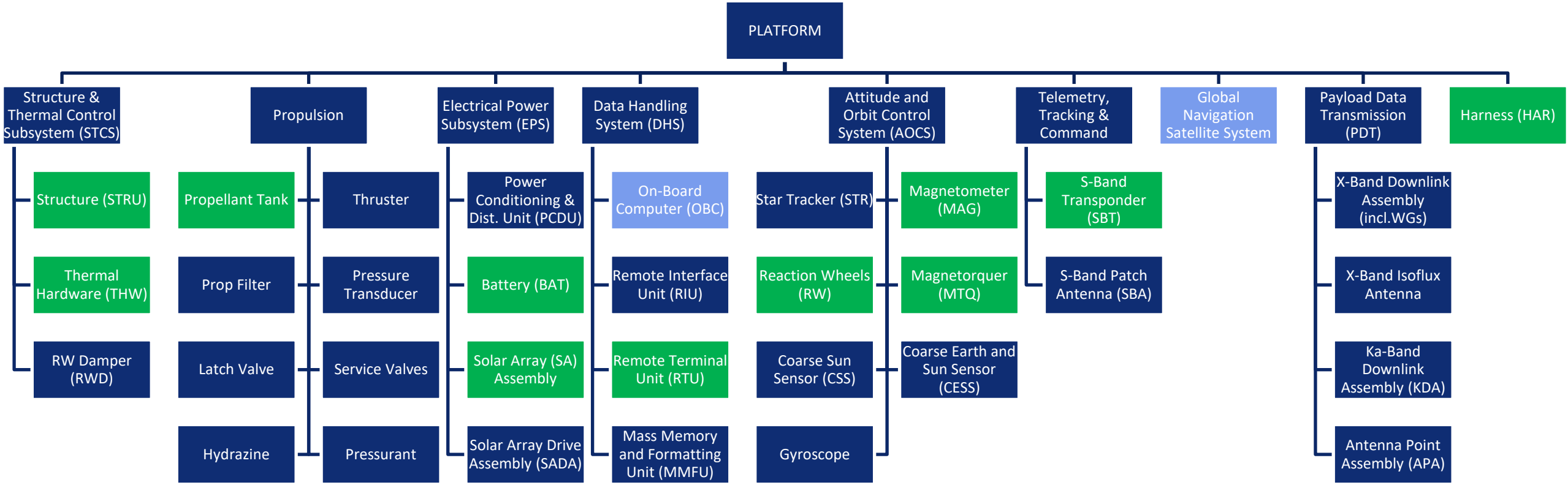
- One of the exiting updates of the ESA LCA DB is moving towards the generation of generic dataset equipment (and supporting datasets), targeting the possibility to model a generic mission and asses the impacts in early phases.

  - A **generic dataset** is a dataset which represents the average model for a certain equipment
  - The generic dataset is used when no primary/specific data is available for that specific object. In fact, it is created **based on average data**.
  - This type of dataset is intended to be used to **estimate** the impacts of a mission in its early development phase (**as a proxy**). For more specific assessment, the use of primary data is recommended.

ESA LCA DB Evolution
Generic datasets



ESA LCA DB Evolution
Generic datasets



ESA LCA DB Evolution
Generic datasets

- A **scalable dataset** is developed when specific correlations or trends within the data can be identified (e.g., some flows change based on mass, others on surface area).

- On the other hand, a **generic dataset** assumes a linear variation of inputs depending on the mass of the equipment.

During the Ecodesign Taskforce, the procedure for the creation of generic datasets will be presented.

Why contribute to the generic datasets for ESA LCA DB?

- Datasets to be used in early phases
- Simplified LCA
- Cover gaps through proxies for standard equipment

Thank you!

www.elecnor-deimos.com