

ecodesign

→ REDUCING IMPACTS

Clean Space Industrial Days

24/10/2017

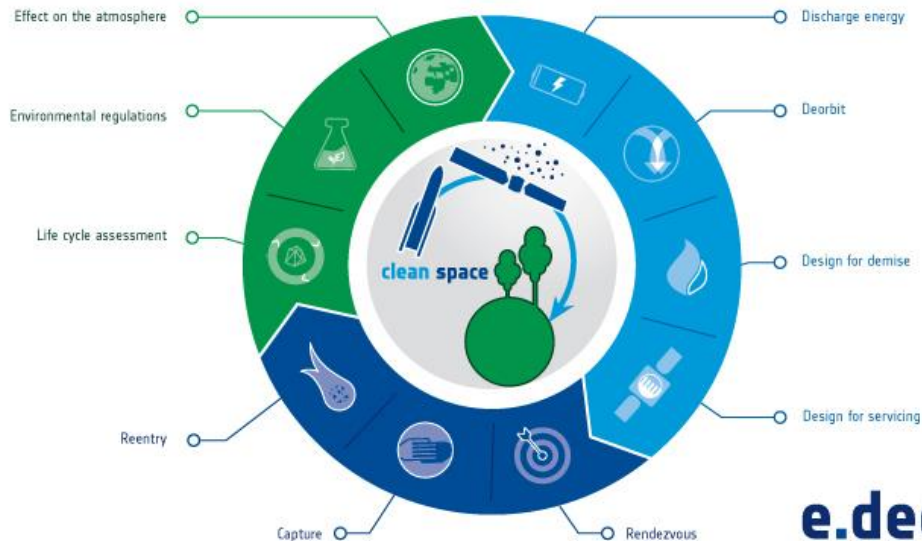


ecodesign

+ REDUCING IMPACTS

cleansat

+ SPACE DEBRIS REDUCTION



e.deorbit

+ ACTIVE DEBRIS REMOVAL

United Nations



General Assembly

**Committee on the Peaceful
Uses of Outer Space**
Scientific and Technical Subcommittee
Fifty-fourth session
Vienna, 30 January-10 February 2017

27.3 States and international intergovernmental organizations should **promote the development of technologies that minimize the environmental impact** of manufacturing and launching space assets and that maximize the use of renewable resources and the reusability or repurposing of space assets to enhance the long-term sustainability of those activities.

Why EcoDesign



United Nations



General Assembly

1. *Proactive approach towards one of main EC goals*
2. *Avoid costly disruptions to projects*
3. *Competitive advantage from being world leader*
4. *...(and of course, it's a good thing to do!)*



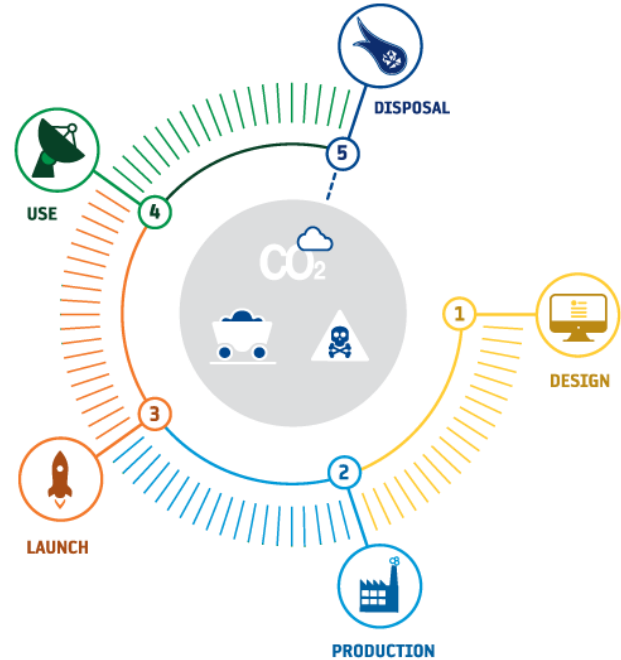
Structure

Clean Space is centralised and cross cutting, making use of experts from different departments and all different funding schemes

2 areas

Environmental Regulation

Life Cycle Assessment

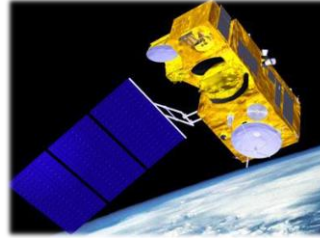


EcoDesign – where are we now?

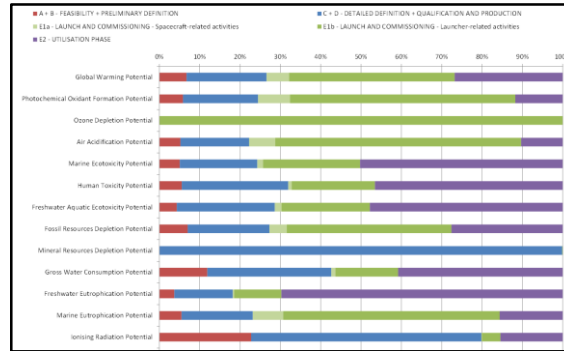
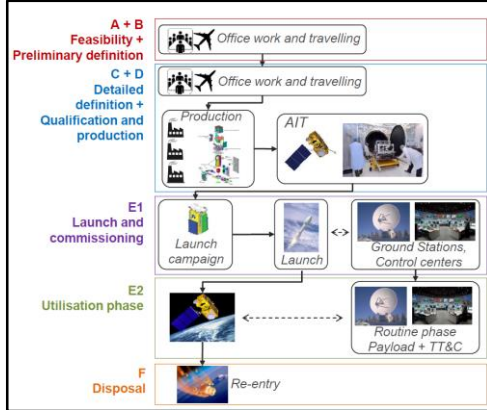
LCA Launch Segment



LCA Space Segment



LCA Ground Segment



Many specificities of space

Specificities of Space

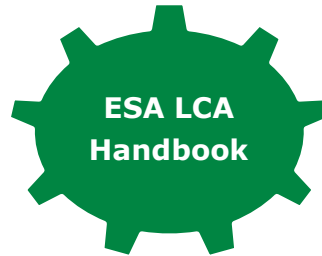
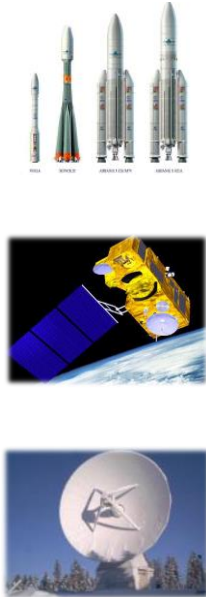
Additional Studies Performed:

- Space Specific Materials, Processes and Propellants LCA
- Space OPERA CDF Tool
- Ozone atmospheric impact
- Space debris indicator for LCA
- Atmospheric impact of demise
- Deep sea impact of falling launcher stages

Ongoing

- GreenSat
- REACH into LCA

EcoDesign – building a framework



An internal working group was created to produce an ESA handbook containing guidelines for **2 main types of LCA** in the space sector:

1

Space Mission

Launcher

Satellite

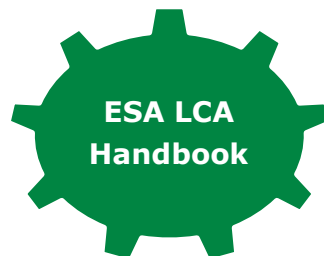
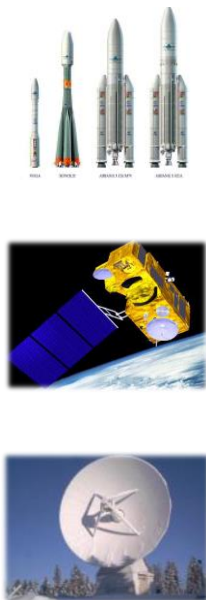
Ground

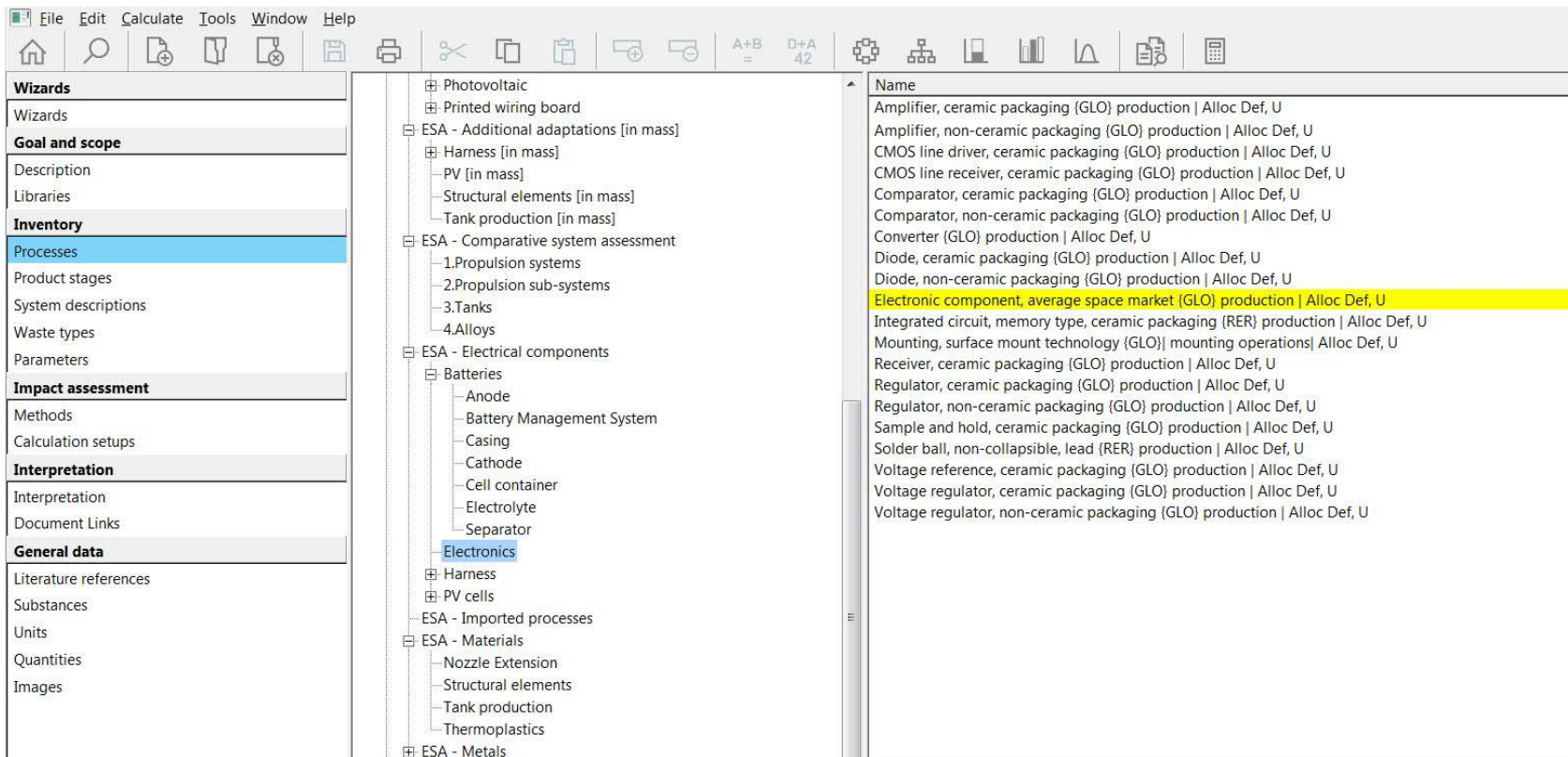
2

Equipment/Component/Material/Process

Available to
Industry

EcoDesign – building a framework

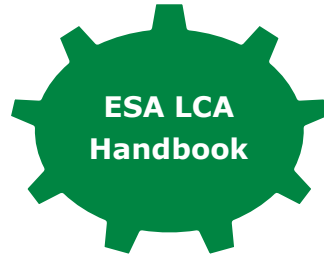
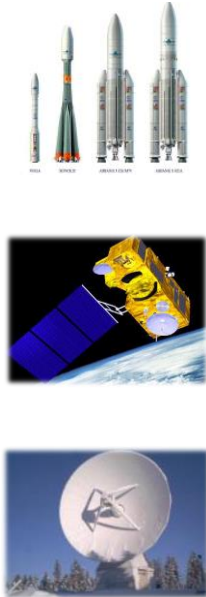


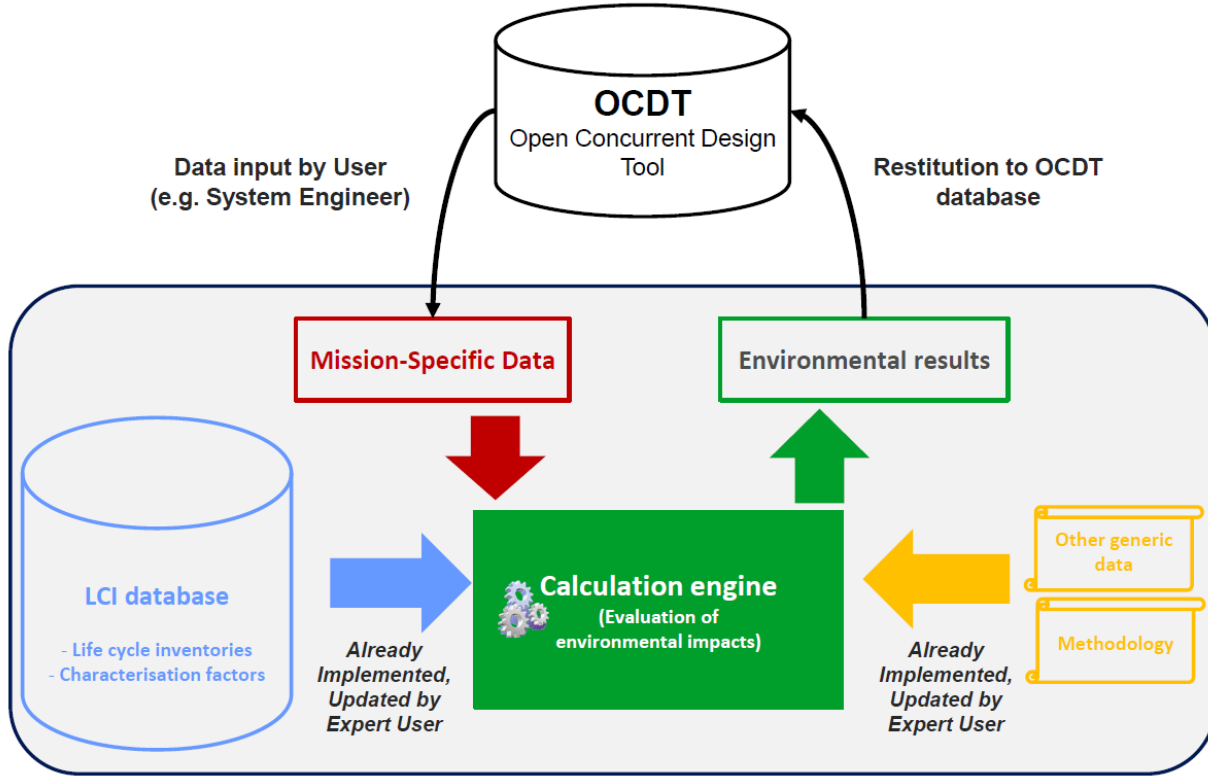


The screenshot shows the ESA LCA Database software interface. The left sidebar contains a navigation menu with sections: Wizards, Goal and scope, Inventory (highlighted), Impact assessment, Interpretation, and General data. The main area displays a tree view of categories, with 'Electronics' selected. The right pane shows a list of electronic components, with 'Electronic component, average space market (GLO) production | Alloc Def, U' highlighted in yellow.

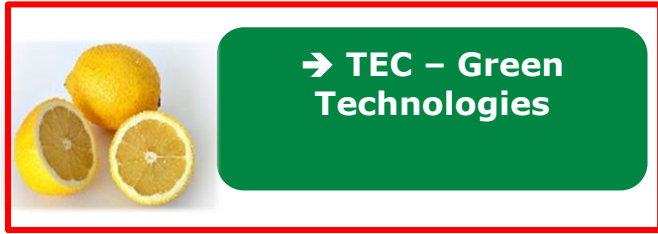
Name
Amplifier, ceramic packaging (GLO) production Alloc Def, U
Amplifier, non-ceramic packaging (GLO) production Alloc Def, U
CMOS line driver, ceramic packaging (GLO) production Alloc Def, U
CMOS line receiver, ceramic packaging (GLO) production Alloc Def, U
Comparator, ceramic packaging (GLO) production Alloc Def, U
Comparator, non-ceramic packaging (GLO) production Alloc Def, U
Converter (GLO) production Alloc Def, U
Diode, ceramic packaging (GLO) production Alloc Def, U
Diode, non-ceramic packaging (GLO) production Alloc Def, U
Electronic component, average space market (GLO) production Alloc Def, U
Integrated circuit, memory type, ceramic packaging (RER) production Alloc Def, U
Mounting, surface mount technology (GLO) mounting operations Alloc Def, U
Receiver, ceramic packaging (GLO) production Alloc Def, U
Regulator, ceramic packaging (GLO) production Alloc Def, U
Regulator, non-ceramic packaging (GLO) production Alloc Def, U
Sample and hold, ceramic packaging (GLO) production Alloc Def, U
Solder ball, non-collapsible, lead (RER) production Alloc Def, U
Voltage reference, ceramic packaging (GLO) production Alloc Def, U
Voltage regulator, ceramic packaging (GLO) production Alloc Def, U
Voltage regulator, non-ceramic packaging (GLO) production Alloc Def, U

EcoDesign – building a framework





Reduce the environmental impact of the space sector by developing green technologies and applying ecodesign during space missions



Already underway in various activities

Technologies designed with the aim of decreasing their Earth environmental impact

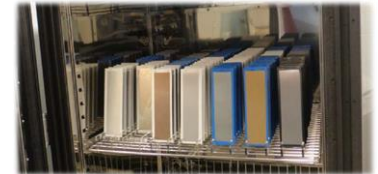
Environmental Footprint

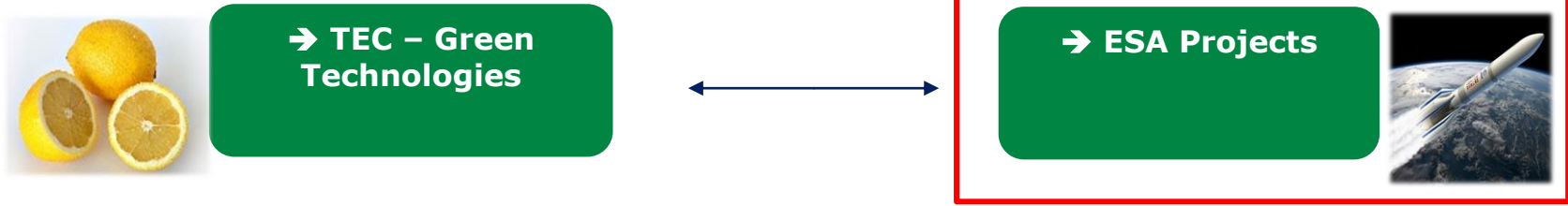
1. Citric as replacement to acid
2. Biocomposite structures



Environmental Regulation

1. Replacement of pyrotechnic powders
2. Chromates replacement testing





**Already underway in
Ariane 6**

A6-SOW-1-RQ-076

Title: Environmental impact

Description:

The environmental impact of the exploitation of the Ariane 6 launcher system (Life Cycle Assessment considering production & assembly, launch campaign, and launch event) shall be analysed and compared to that of A5 ECA on the basis of:

- One launch
- Yearly equivalent P/L mass delivered in orbit.

Notes:

Expected answer

Due Item: [DRL-67]Environmental impact of the exploitation of the Ariane 6 Launcher System

Creating awareness



THANKS FOR YOUR ATTENTION