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In collaboration with REACHLAW

# How to assess the material obsolescence risk related to REACH?

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Clean Space Industrial Days – EcoDesign, ESTEC, 23-25 October 2018

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How to assess material obsolescence related to REACH at (pre-)design stage?

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# 1. How ESA eco-design framework and REACH are related?

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# How are ESA eco-design framework and REACH related?

## REACH : what are we talking about?

**Non-REACh Lists**

SIN List

Restricted and Priority Substances database

**Registration** → Non-registered substances

**Evaluation**

PACT-RMOA list
Registry of Intentions (RoI)
Annex XV

- SIN List
- Substances under screening and RMOA, RoI
- SVHCs, substances in the candidate list
- Prioritised substances from Candidate List to inclusion in Authorisation List
- Annexes XVII and XIV

**REACh/CLP Regulatory risk management**

**CLP Regulation**

Annex VI of CLP regulation

**Restriction**

Restriction List = Annex XVII

**Authorisation**

SVHC, Candidate List
Authorisation List = Annex XIV

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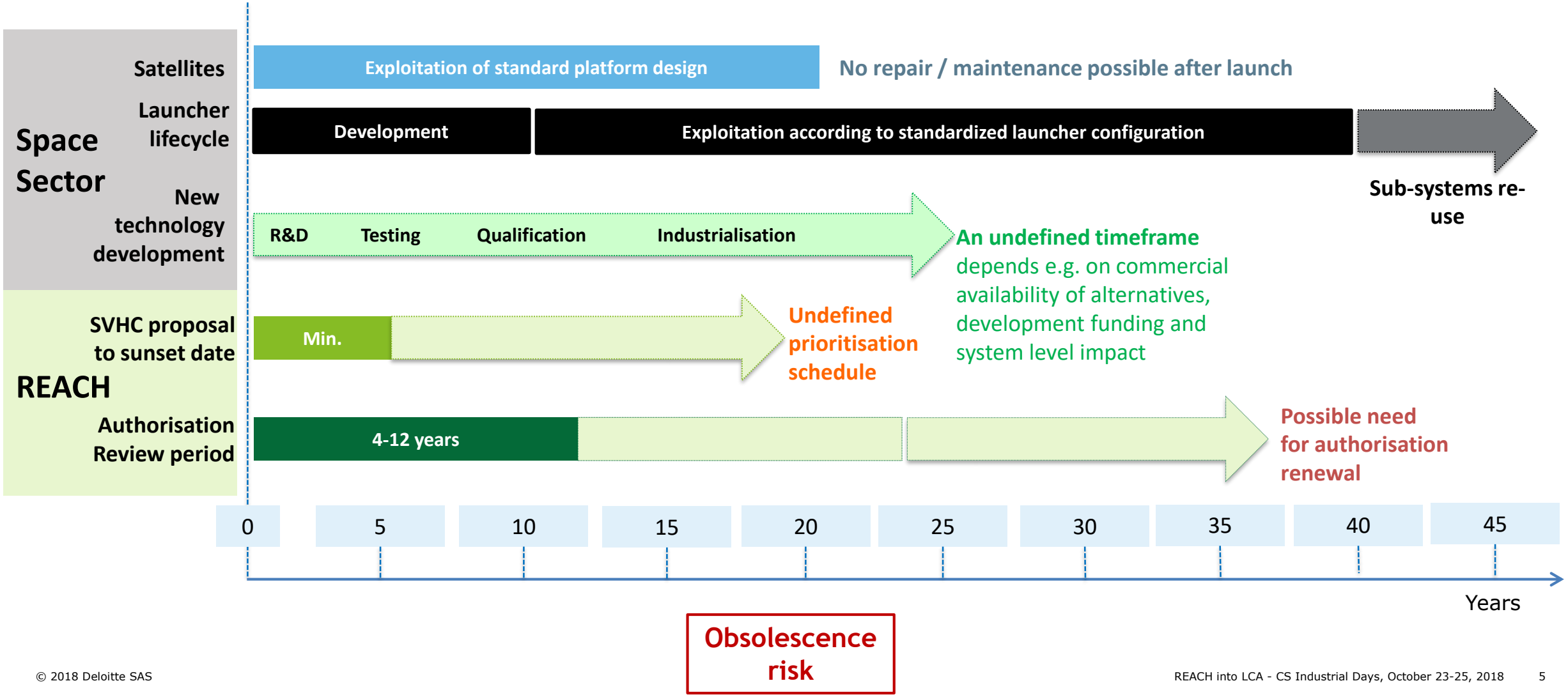
# How ESA eco-design framework and REACH are related?

## REACH obsolescence risks for space programmes - Challenges for the space sector: strong mismatch of timelines

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# How ESA eco-design framework and REACH are related?

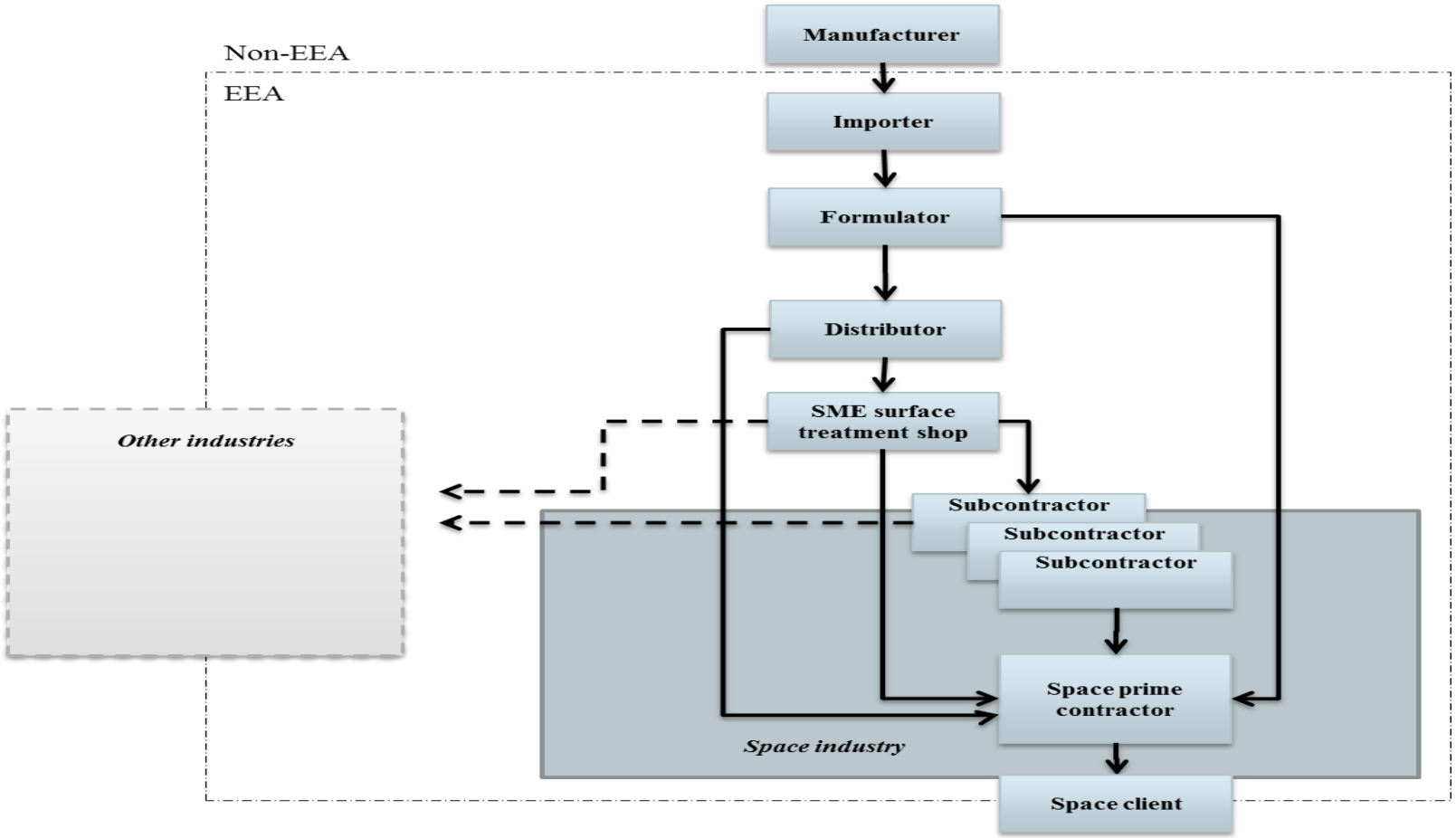
## REACH - Challenges for the space sector: complex supply chains

Complex supply chains leading to the manufacture of space hardware, e.g. A5 consists of > 150 000 parts, ~ 1 500 subcos in tier 1, typically 3-5 tiers with 70% suppliers within and 30% outside EU

Main implications:

- a lack of visibility as regards upstream materials and processes used and at risk of REACH-related obsolescence
- Space industry dependence on upstream supplier actions to avoid supply chain disruptions (continued supply, REACH registration and authorisation applications)
- Chemical suppliers alternatives typically driven by requirements from non-space sector
- SMEs involved in supply chains find it difficult to comply and may not be able to pay the REACH costs.

Supply chain communication is therefore of prime importance to avoid supply chain disruptions and mitigate REACH obsolescence risks.

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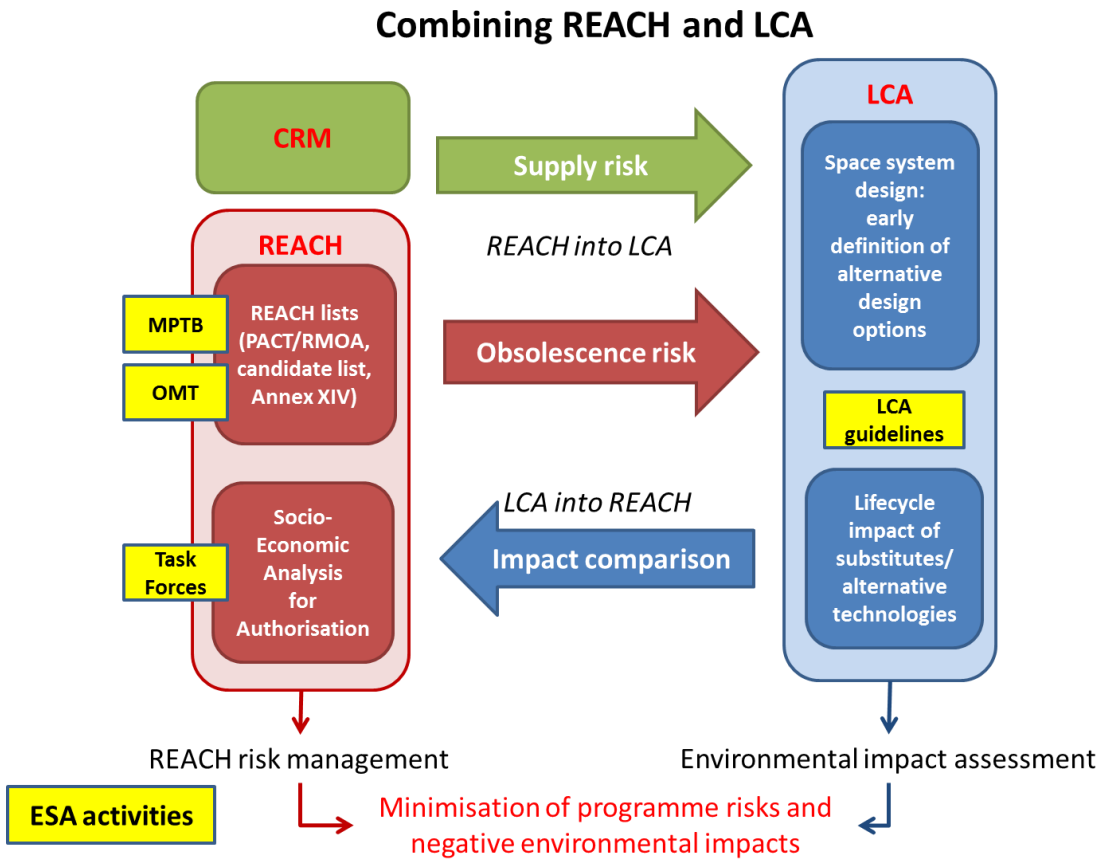
# Presentation of the project and its objectives

1. To develop and validate an adaptation of the LCA methodology to identify, flag and classify the obsolescence risks due to REACH through the complete life-cycle of space products: "**REACH into LCA**"

2. To establish how LCA can support REACH risk management efforts (e.g. REACH authorization) and demonstrate through one specific case study: "LCA into REACH"

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# 2. The risk evaluation methodology

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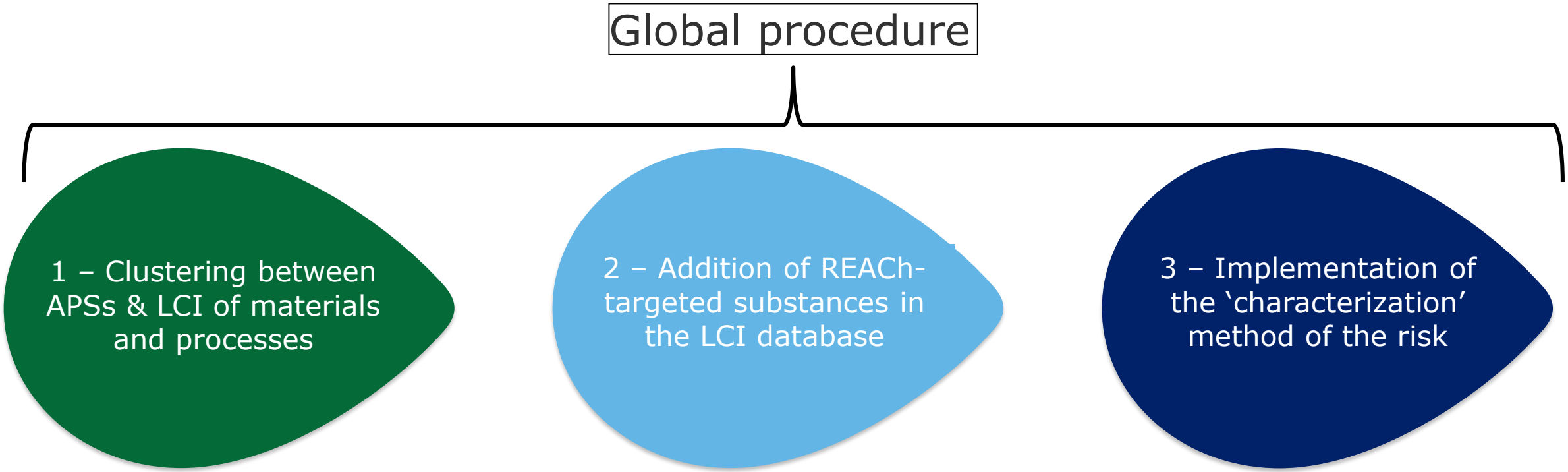
# The risk evaluation methodology

## General workflow




The objective is to develop a risk evaluation for **raising awareness at pre design stage** related to the REACH obsolescence risk. It does not aim to modify radically the design but rather to **initiate the dialogue** between the diverse actors.
The first results should be **challenged by the REACH office**.

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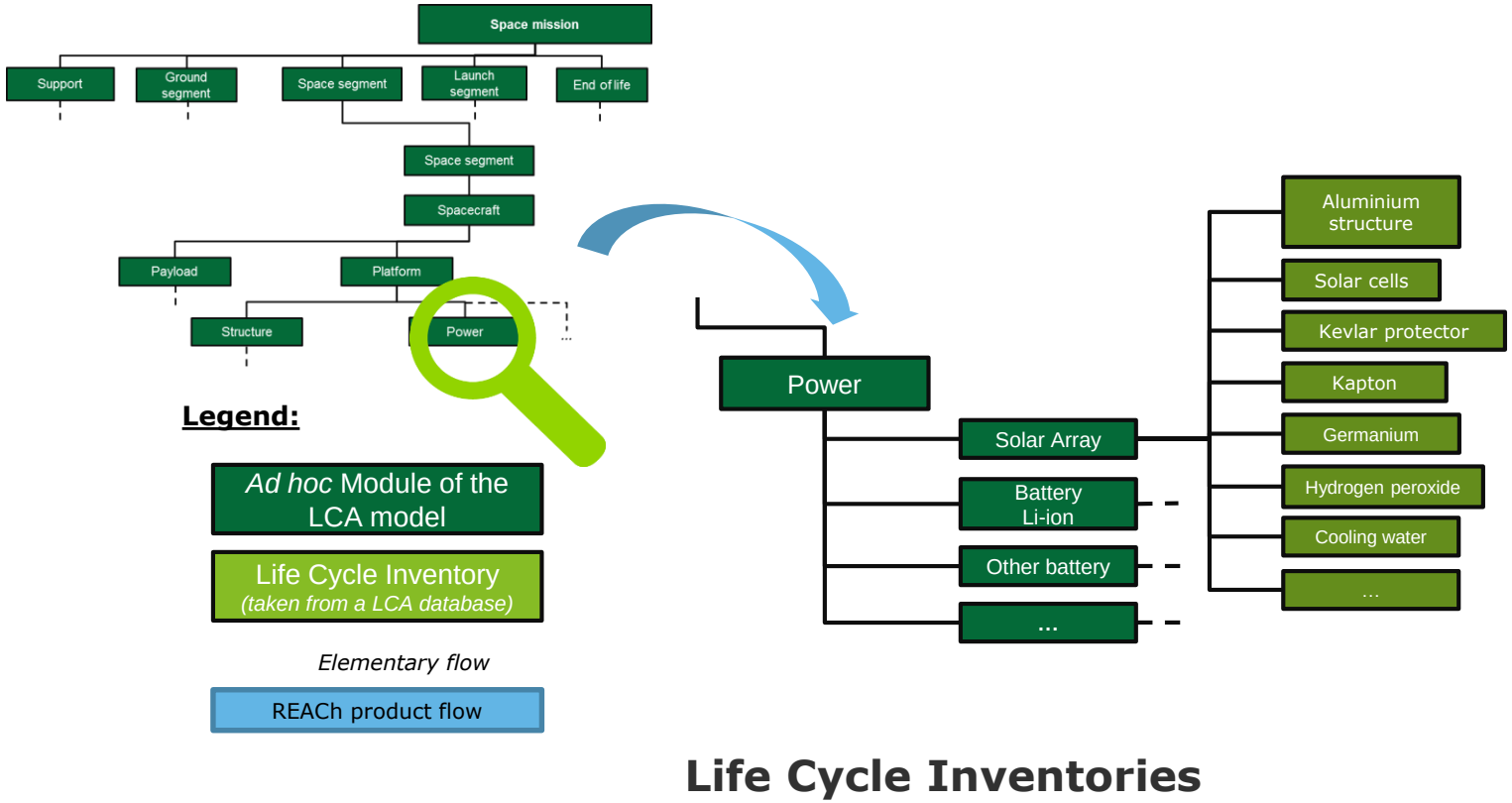
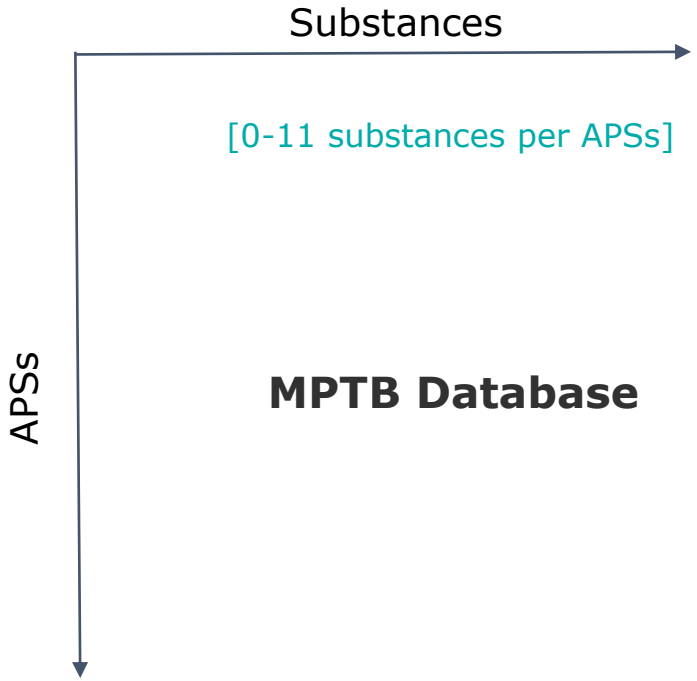
# The risk evaluation methodology

## How can the LCA and space material databases be mapped together?




APS = article, preparation, substance

~a material composed of different chemical substances




# How can LCA models and MPTB database “communicate”?

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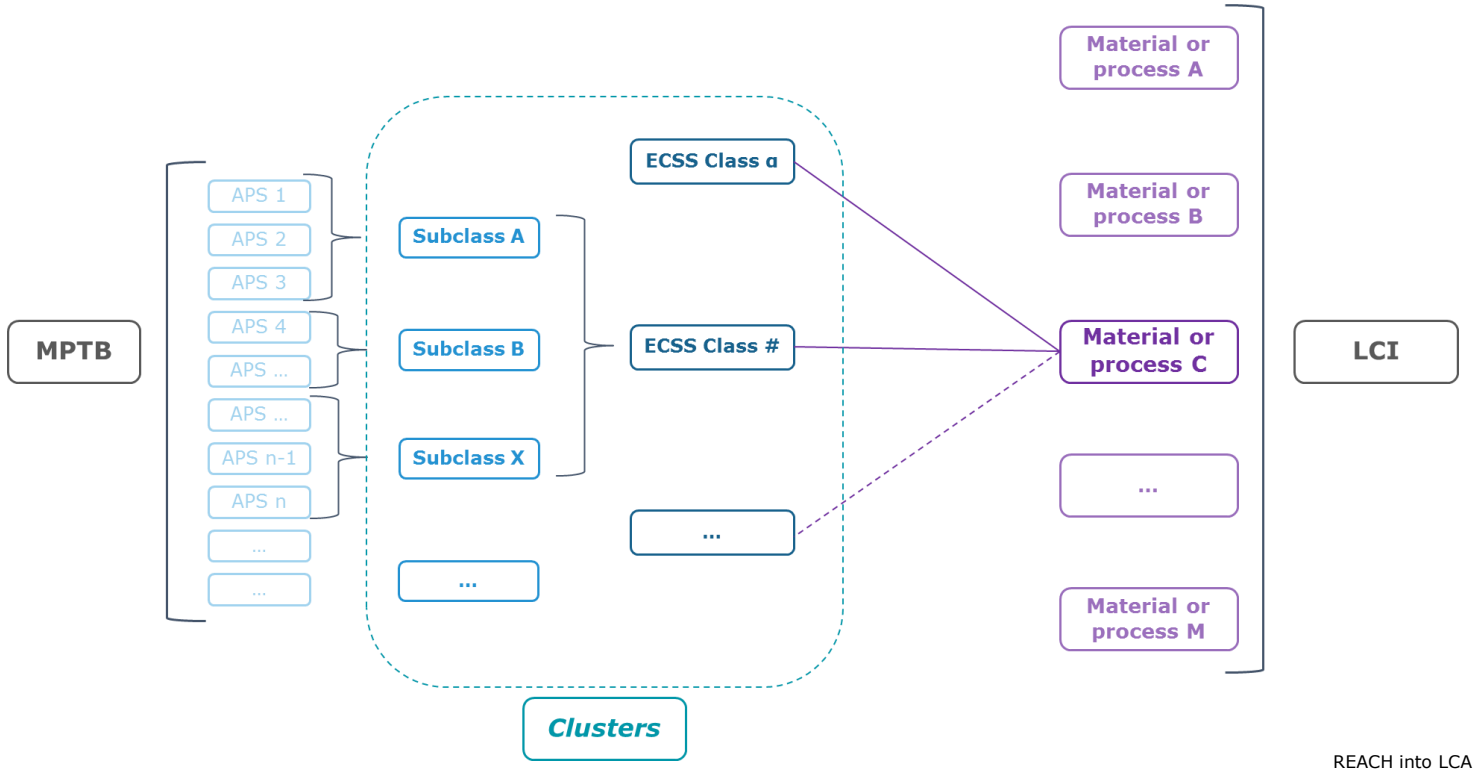
# The risk evaluation methodology

## How can the LCA and space material databases be mapped together?

We adopted a **clustering approach**. To build clusters of APSs, the **requirements** are:

- It should enable to **gather APSs in small groups** in an unambiguous way (i.e. each APS must belong to one and only one cluster);
- It should provide categorising rules as consistent as possible to be **easily mapped with LCI datasets**.

Within the framework of this project, it was decided to define a cluster as a **group of APSs belonging to the same ECSS class or subclass, corresponding to a specific use in a space mission**.

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# The risk evaluation methodology
## Risk assessment

- The focus is set on the creation of a process to make a **risk assessment for any cluster of material.**
- The risk assessment must be able to **give an overview of the most risky clusters** to anticipate corrective actions and initiate an obsolescence management strategy.
- The risk assessment has to be built based on **the same methodology for each cluster** in order to have consistent data to compare.
- It must be noted that the risk assessment is based on a **static snapshot of the MPTB database and** this database is considered as **statistically representative.**
- To improve the risk characterisation, an **iterative approach is** adopted.
- The starting point is the **LCA model** which provides the structure tree of space missions.

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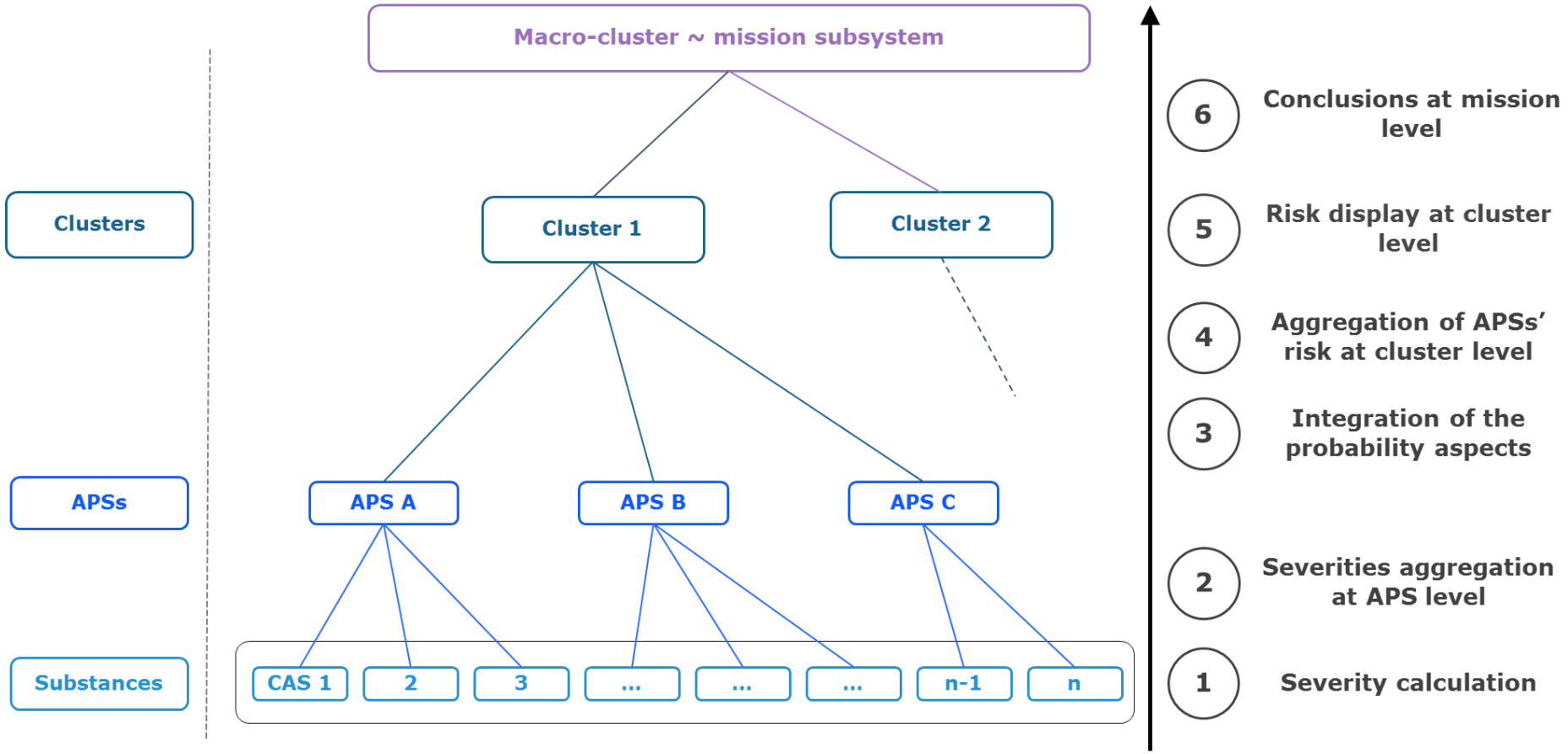
# The risk evaluation methodology

## Risk assessment

RISK = SEVERITY of the substance* PROBABILITY of use

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# The risk evaluation methodology

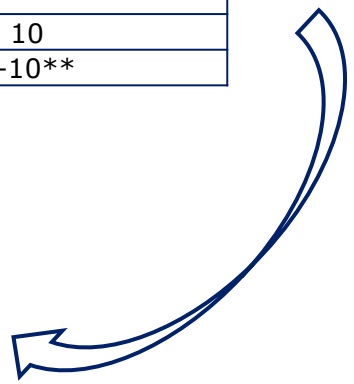
## Risk assessment

The preferred **methodology for risk assessment is currently being refined on a case study**.

First step: determine the severity of an APSs based on the REACH lists its substances belong to

| 'Blacklist' | Qualification of obsolescence risk | Severity factor proposed |
|---|---|---|
| **SIN List** | Vaguely long-term | 1 |
| **PACT/RMOA List** | Possibly mid-term | 2/3* |
| **Candidate List** | Probably mid-term | 4/5 |
| **Annex XIV Recommendation** | Probably short-term | 8 |
| **Annex XIV List** | Imminent and high | 10 |
| **Annex XVII List** | Depending on the restriction/use | 1-10** |

| APS | Score |
|---|---|
| **A** | N |
| **…** | … |
| **…** | … |
| **…** | … |



The severity score at APS level can be

1. The sum of the severities of its constitutive substances
2. Their maximum

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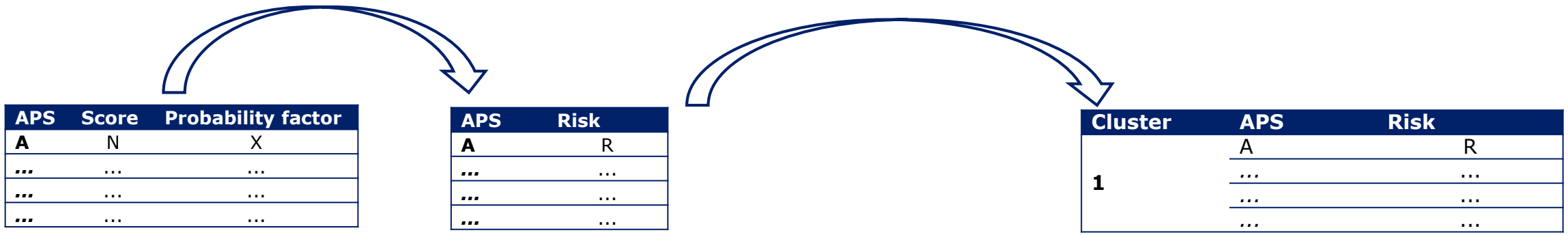
# The risk evaluation methodology

## Risk assessment

The severity score of the APS is then multiplied by a factor representing the **probability** that this APS will effectively be used compared to the others of the cluster

The risk is then **aggregated at cluster level**.



| APS | Score | Probability factor |
|---|---|---|
| **A** | N | X |
| **…** | … | … |
| **…** | … | … |
| **…** | … | … |

| APS | Risk |
|---|---|
| **A** | R |
| **…** | … |
| **…** | … |
| **…** | … |

| Cluster | APS | Risk |
|---|---|---|
| | A | R |
| | … | … |
| **1** | … | … |
| | … | … |

**Default probability factors** are used if there is no knowledge of the space mission. They can be refined by experts.

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# 3. Conclusions & next steps

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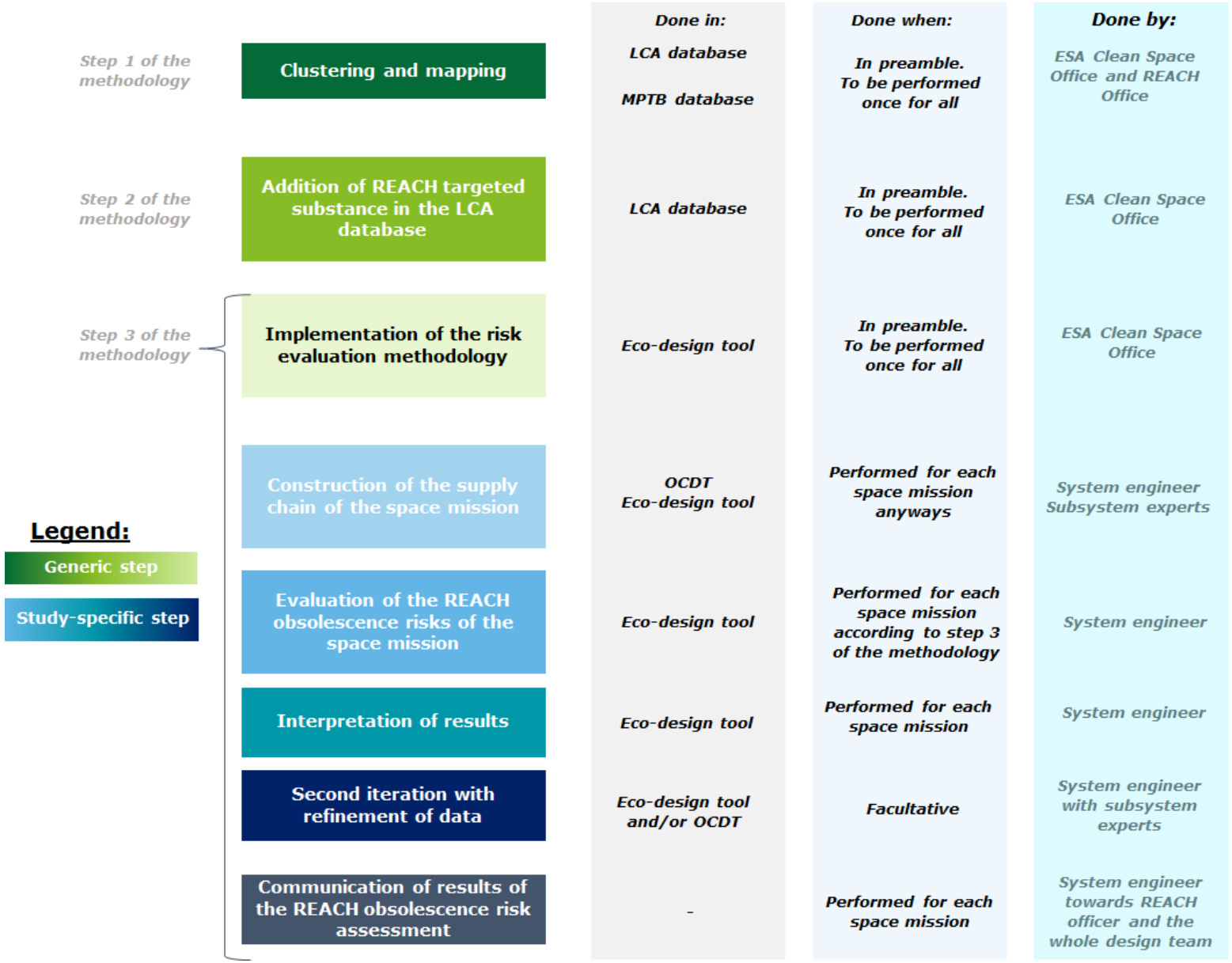
# Conclusions & next steps

## Conclusion

A three steps methodology to identify **risks hotspots** related to REACH at pre **design stage**

Split between **generic steps** performed once and updated periodically and **study specific steps** which refine the assessment

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# Conclusions & next steps

## Next steps

Within the project

- Finalise the risk assessment and **refine the methodology,** especially on the presentation of the risks at mission level
- Define the best **communication and cooperation framework** to share the outcomes of the evaluation

Furthers steps

- **Implementation** in ESA systems
- **Automation** of the process

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# Thank you for your attention!

Any questions?

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