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## Beyond the hype: delving into the environmental impacts of supercritical fluids' applications

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# Beyond the hype: delving into the environmental impacts of supercritical fluids' applications

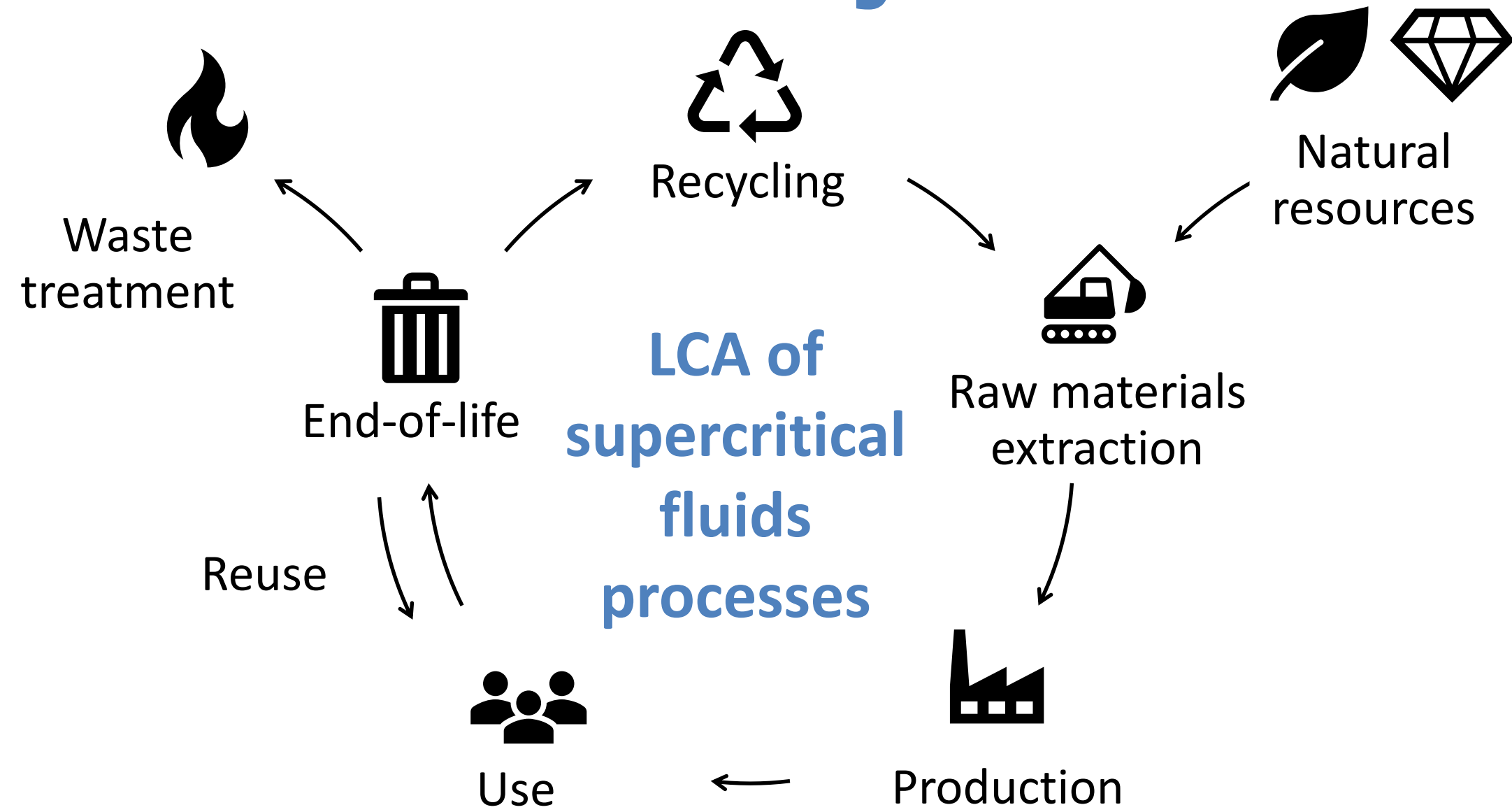
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## Context and objective



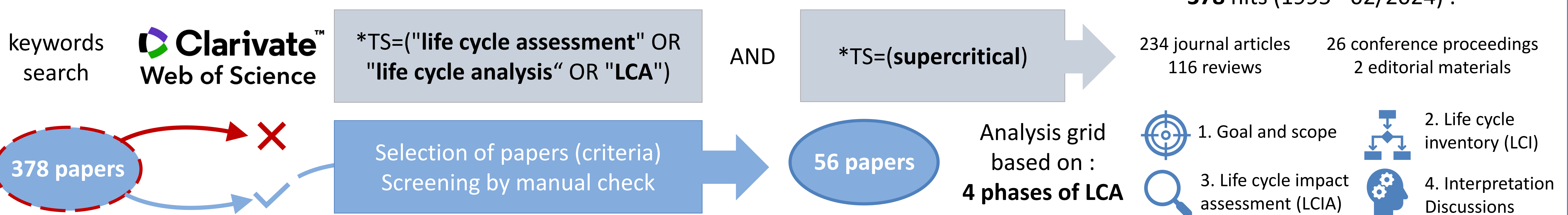
- Solvent use of a sc-fluid process ?
- Energy use of a sc-fluid process ?
- "Greener" than conventional processes ?

### Objectives :

- Compile all papers related to LCA (Life Cycle Assessment) studies on supercritical fluids processes
- Analyze the papers with an analysis grid derived from the four phases of LCA

## Articles collection

\*TS = Topic (Title, Abstract, Author Keywords, Keywords Plus®)



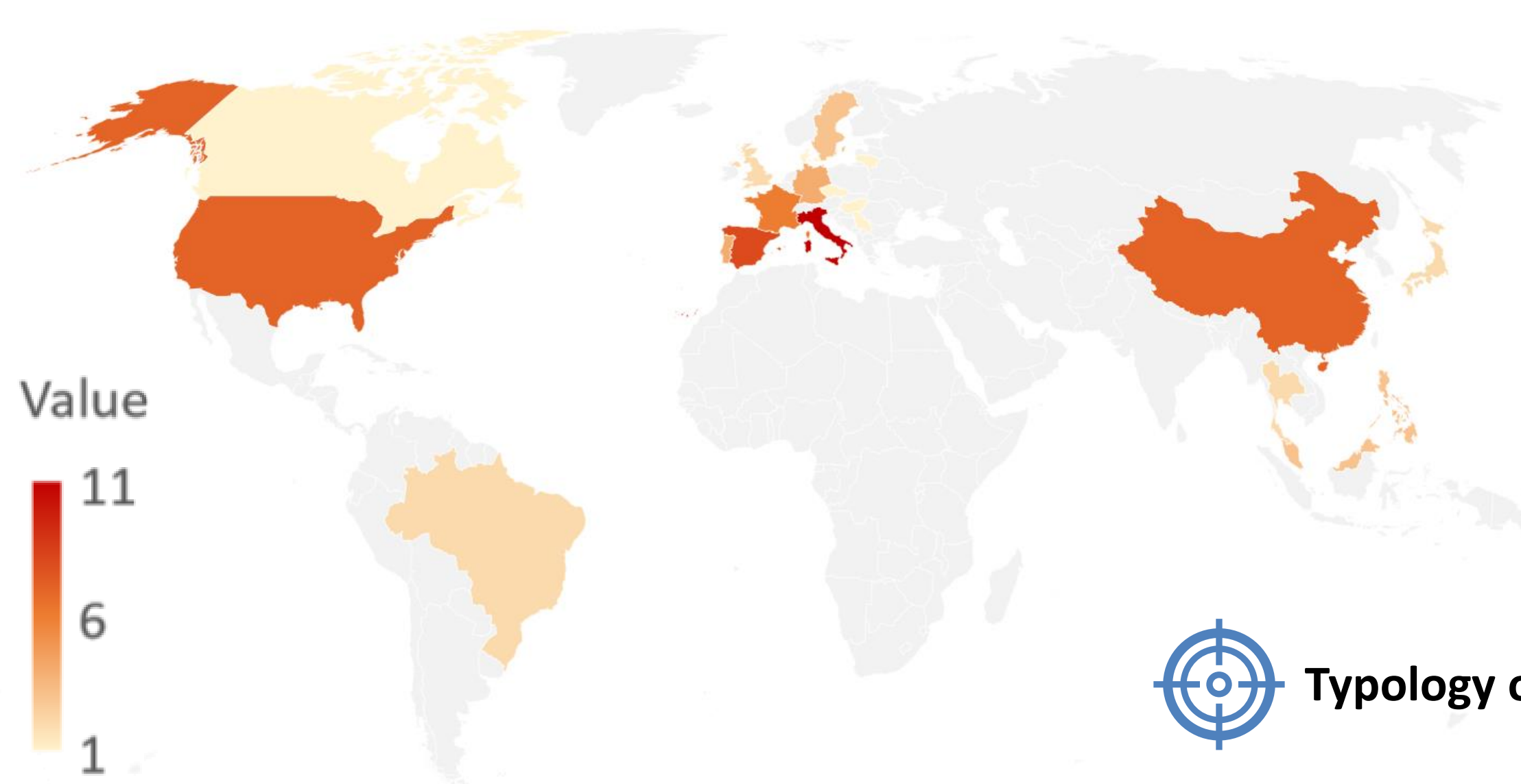
## Results

### Countries

### 1. Goal and scope

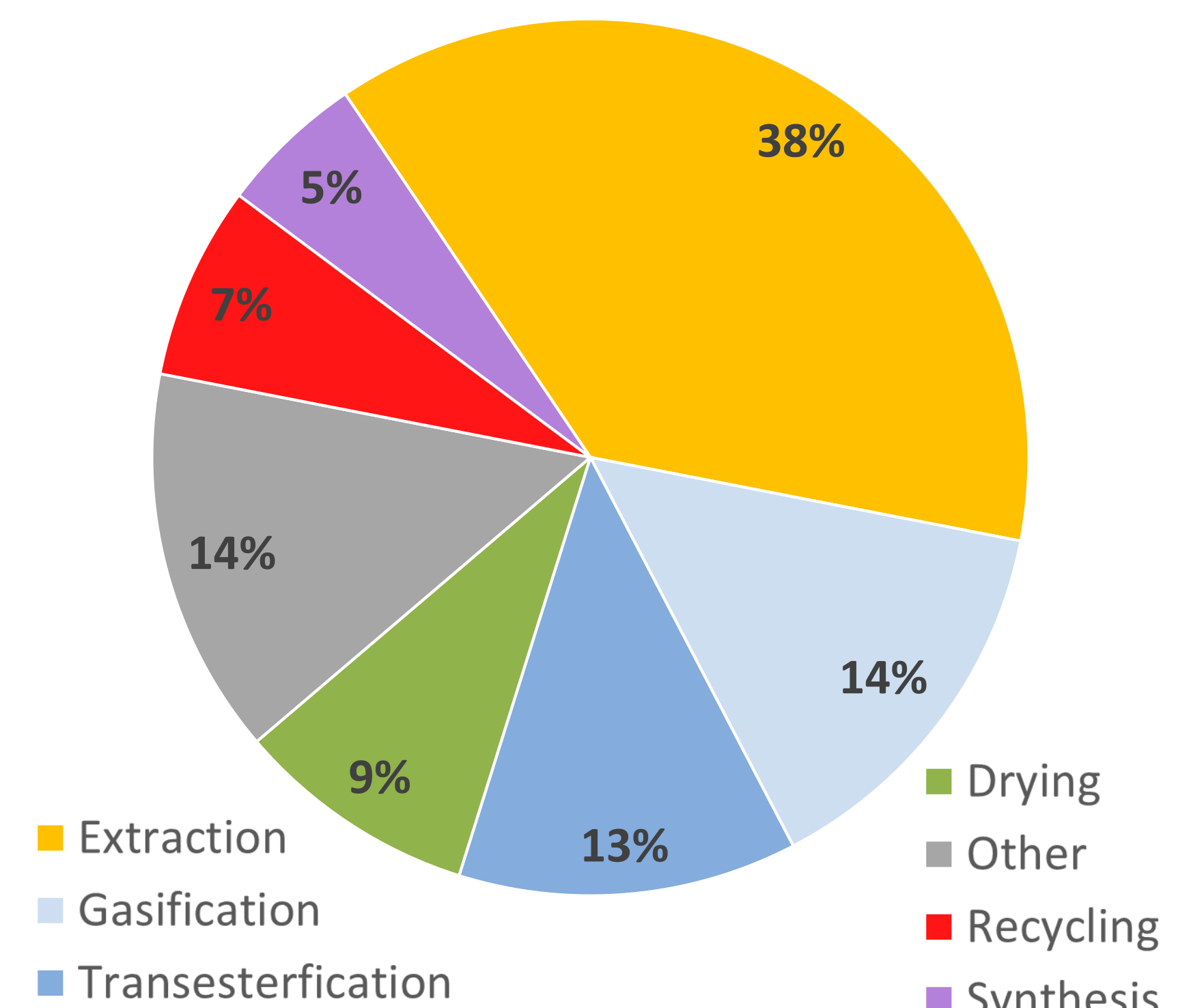
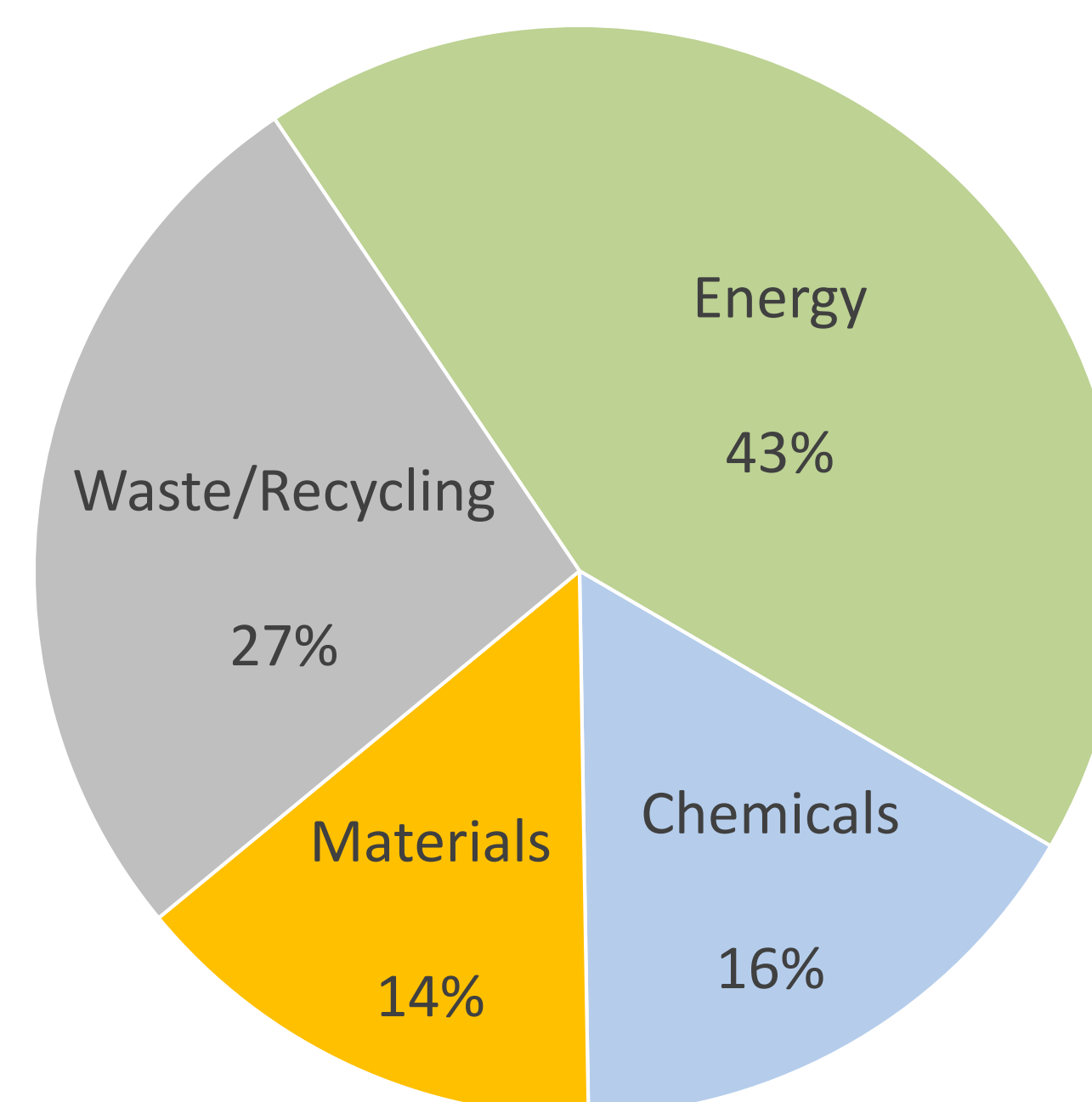
### Sector

### Process type



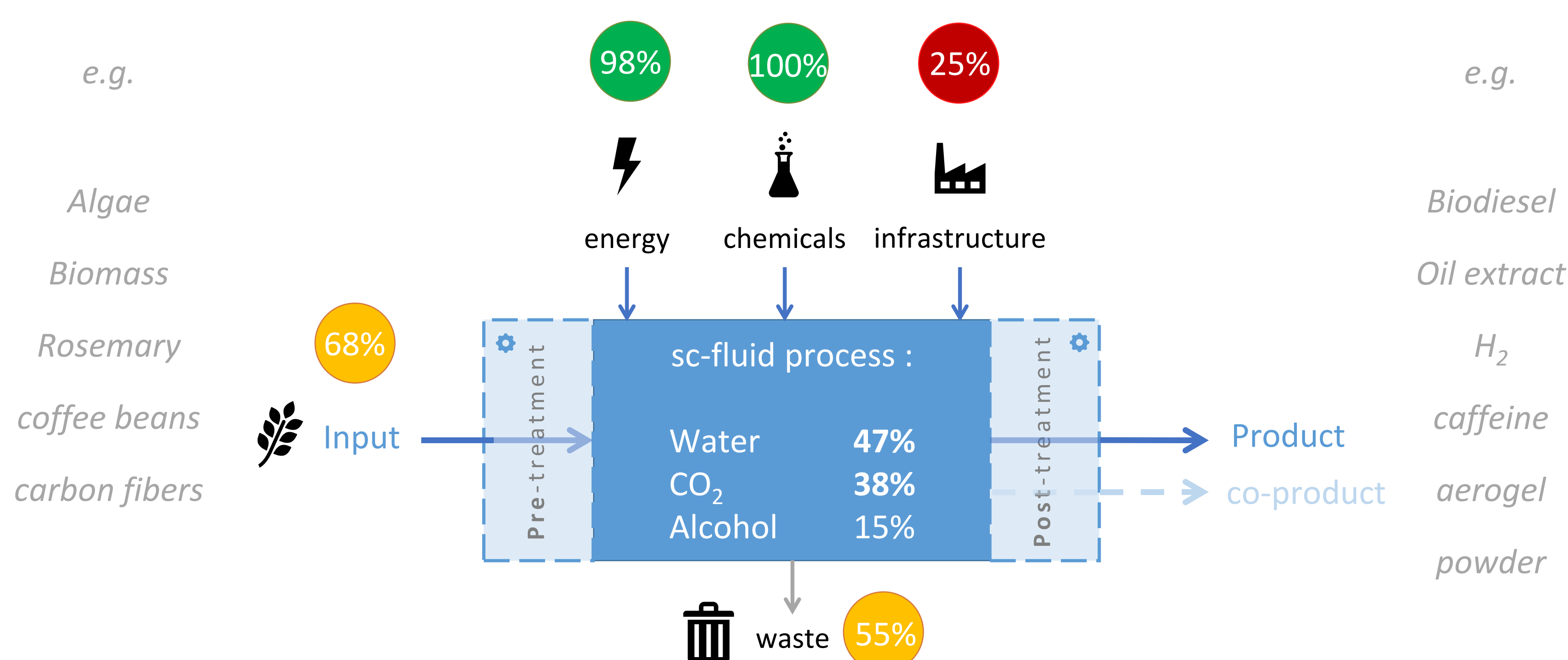
#### Typology of goal :

Benchmarking with other processes	41%
Foot-printing	32%
Eco-design (optimization)	38%

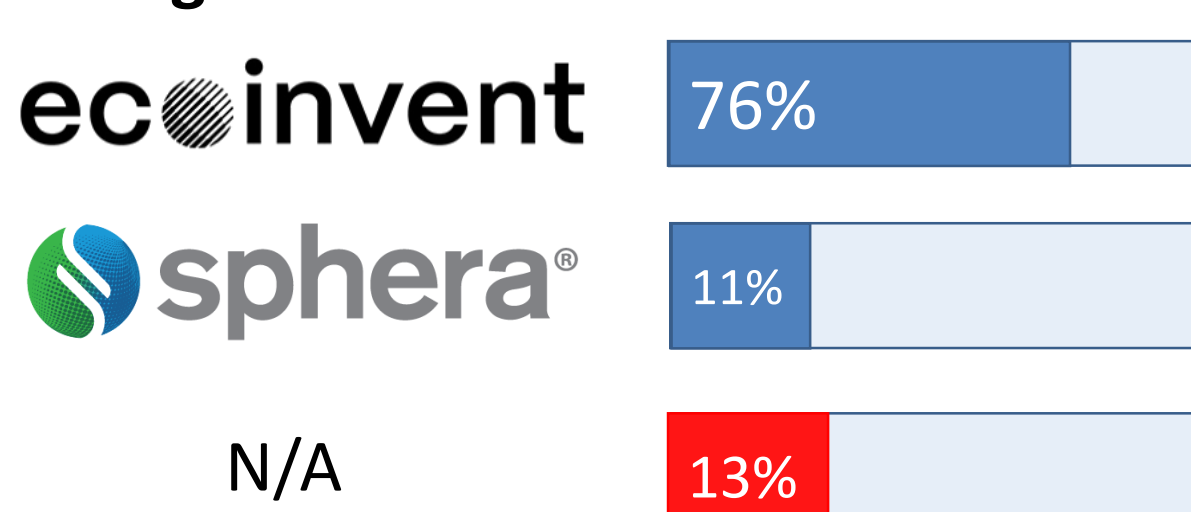


### 2. Life cycle inventory (LCI)

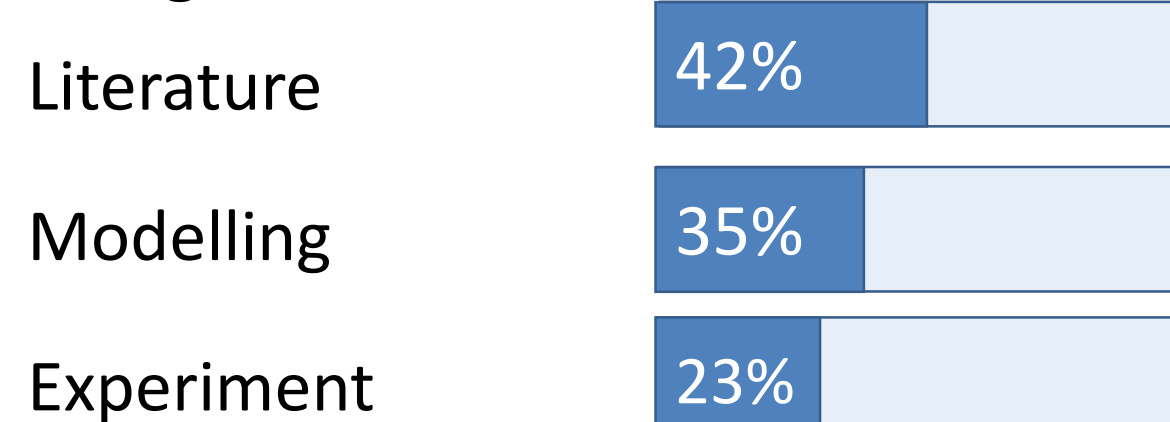
% of the elements considered in the studies :



#### Background database :

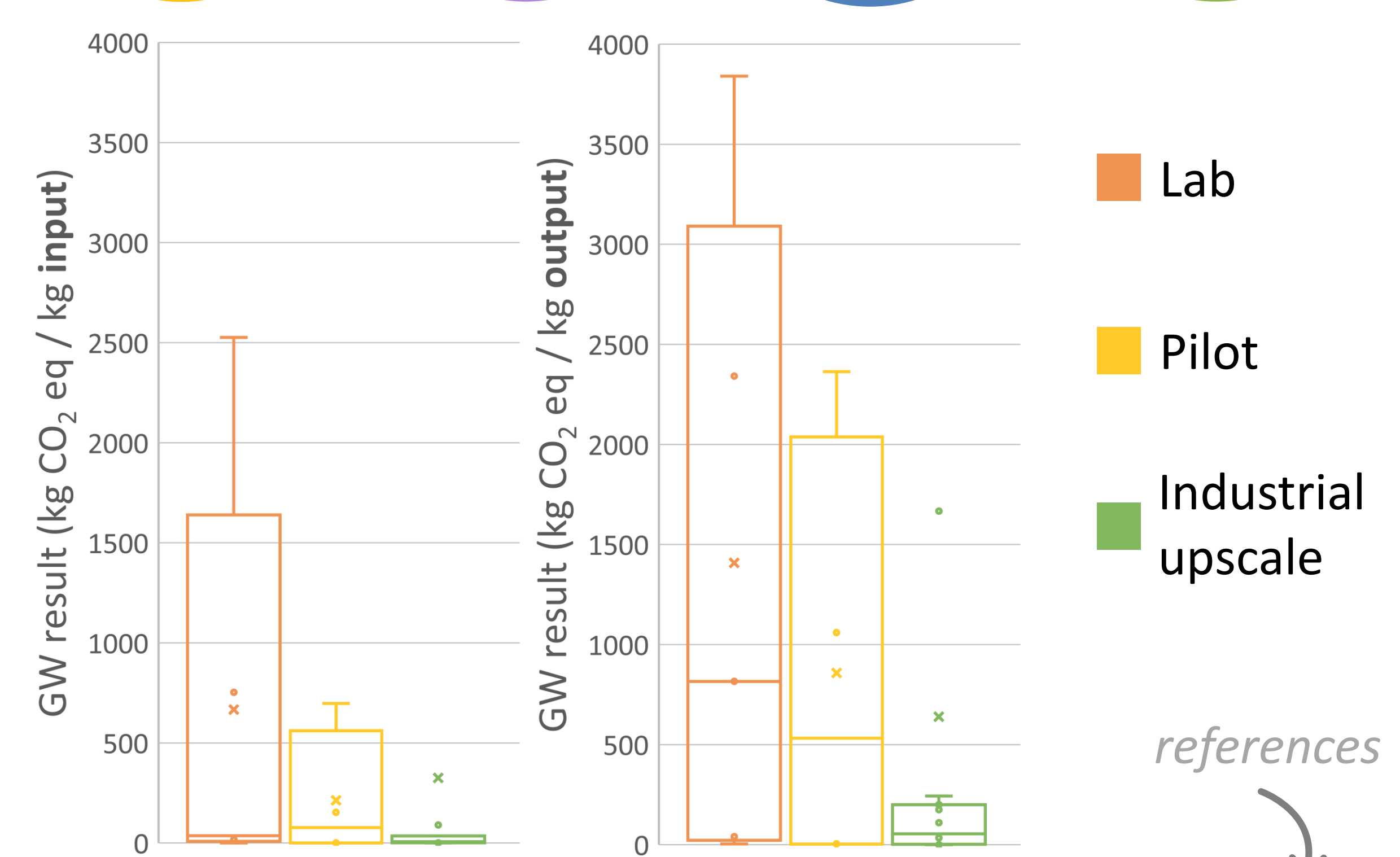
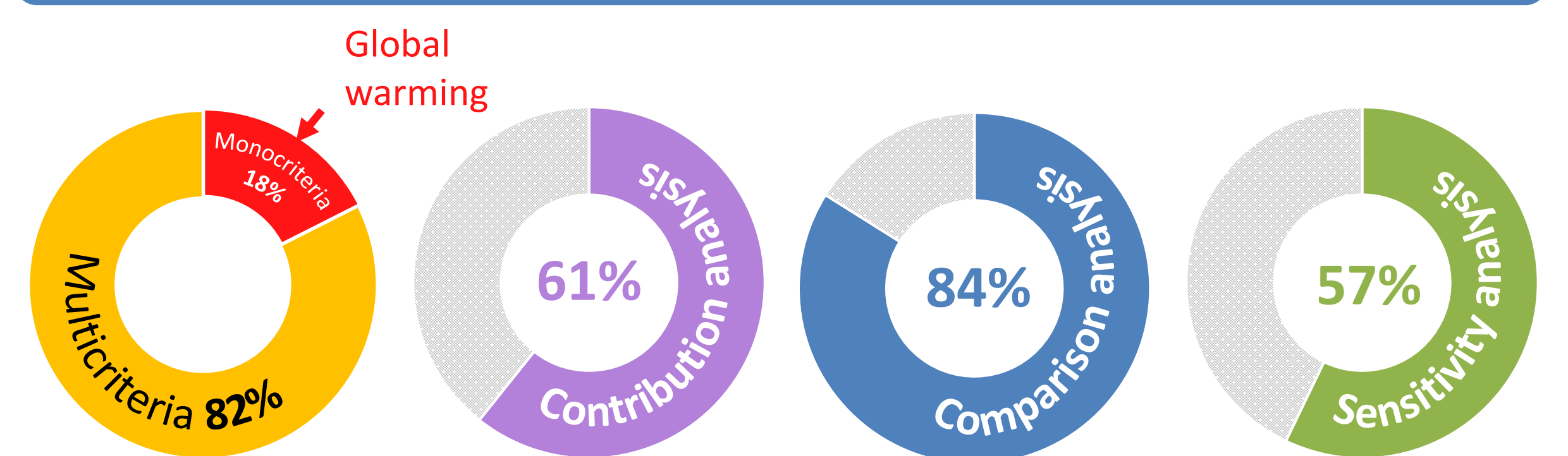


#### Foreground data :



	Lab-scale range (39%)	Pilot scale range (10%)	Industrial scale range (33% + 19% upscale)
Sc fluid use (kg / kg input)	[ 1 – 200 ]	[ 0.3 – 20 ]	[ 0.1 – 20 ]
Energy use (kWh / kg input)	[ 0.1 – 700 ]	[ 0.1 – 200 ]	[ 0.1 – 100 ]

### 3/4. Life cycle impact assessment and interpretation



Compared to conventional processes :

- 😊 40% ⇔ less environmental impacts
- 😞 29% ⇔ higher environmental impacts
- 😐 31% ⇔ unclear results

