



How to include security of resource supply in supply chain assessments and LCA?

Workshop “Security of Supply and Scarcity of Raw Materials: a Methodological Framework for Supply Chain Sustainability Assessment”
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Outline

- Aspects included in Criticality metrics
- (Mis)match between Criticality and LCA metrics
- Recommended scope for Environmental LCA
- Integration of remaining components



Aspects included in Criticality metrics

- Environmental implications/management

- Vulnerability to supply restriction
 - Importance
 - Substitutability
 - Ability to innovate

- Supply risk
 - Geological depletion including recycling
 - Social and regulatory
 - Geopolitical (political stability of producing countries)



(Mis)match between Criticality and LCA metrics **now**

Criticality	Life Cycle Assessment
Environmental implications	Captured in other life cycle impact categories
Importance	<i>Missing</i>
Substitutability	<i>Missing</i>
Ability to innovate	<i>Missing</i>
Geological depletion	Addressed by many LCIA methods
Recycling	Accounted by future primary demand scenarios in LC-IMPACT
Social and regulatory	<i>Missing</i>
Geopolitical	<i>Missing</i>



Recommended scope for Environmental LCA

- In **environmental LCA** (E-LCA), we aim at quantifying potential impacts from an interaction with nature
 - For **abiotic resources**, it addresses the cause-effect chain resulting from the extraction of primary resources from nature
 - Include only biophysical context thus geological and technological components
 - **Geological depletion** is included; There are now many LCIA methods doing this
 - **Recycling** can be included if combined with future production scenarios to reduce the amount of primary extraction needed in the future; It results on the future consequences of today's extraction for a specific resource



Integration of remaining criticality components

- E-LCA does not typically address components that start with **social or economic flows**

- In **social LCA**
 - The Social LCA guidelines (http://www.unep.fr/shared/publications/pdf/DTIx1164xPA-guidelines_sLCA.pdf) developed by UNEP-SETAC Life Cycle Initiative list a sub-impact category defined as “**access to material resources**”; This could be defined as a socio-economic resource supply risk indicator
 - Including the degree to which the resource can be **substituted** will tell how dependent you are from an individual resource but how can it be taken into account?
 - **Political stability** but which temporal scale? Smaller than 5 years?
 - The metric developed should be **spatial differentiated** (e.g. European Union) and maybe **sector differentiated**

- **Economic importance** should be excluded in a product’s life cycle context; it is important for criticality but not for resource security



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