



Re-thinking LCA & LCC: enabling full accountability of the environmental and socio-economic benefits of circular fertilisers

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Outline

Rethinking LCA & LCC

FER-PLAY Final Conference, Brussels 18-19 Feb 2025



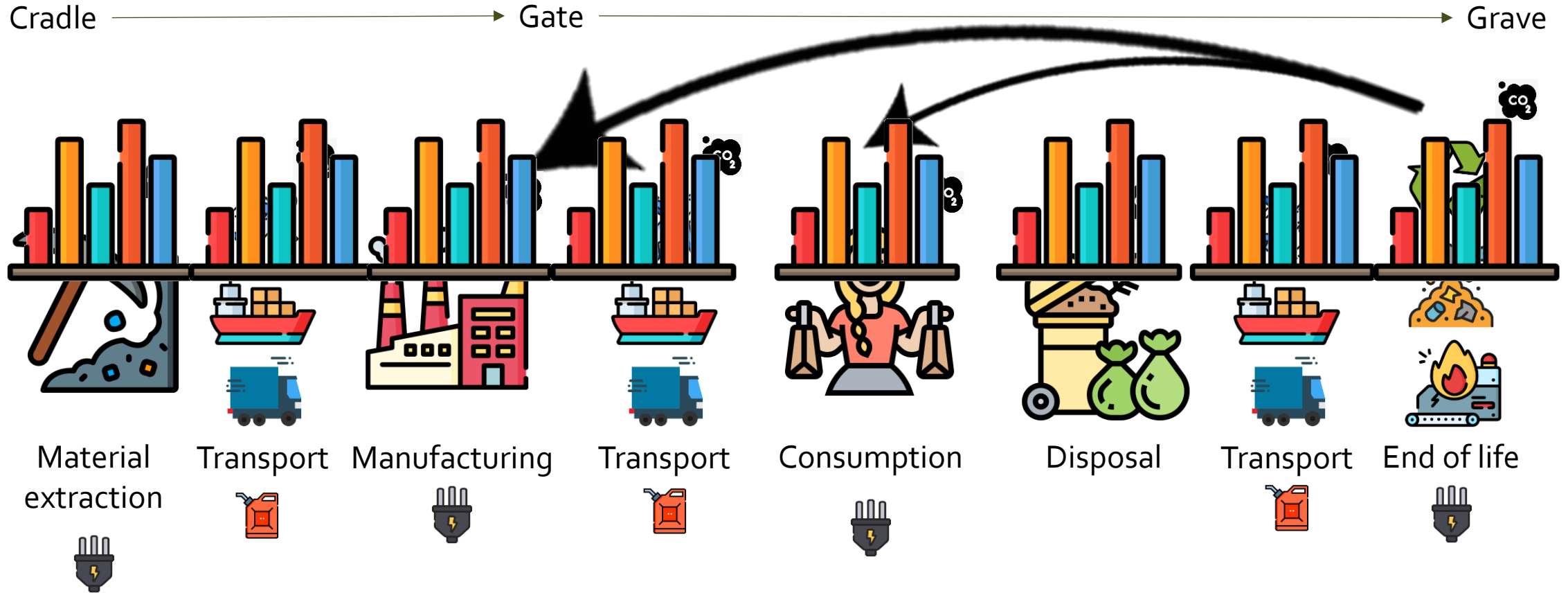
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- ▶ **LCA: beyond the buzzword**
- ▶ **Comparison alternatives**
- ▶ **The true function of circular fertilisers**
- ▶ **The scope of LCA methods**
- ▶ **LCC vs. other economic analyses**
- ▶ **Final thoughts**

LCA: beyond the buzzword



LCA: beyond the buzzword



Comparison alternatives



Comparison alternatives

Waste management

Fertilizer production and use

Different scopes
Different calculation
Different conclusions
Different objectives



The true function of circular fertilisers



The true function of circular fertilisers

Solid inorganic fertilizer
 ≥ 3% N
 ≥ 3% P₂O₅
 ≥ 3% K₂O

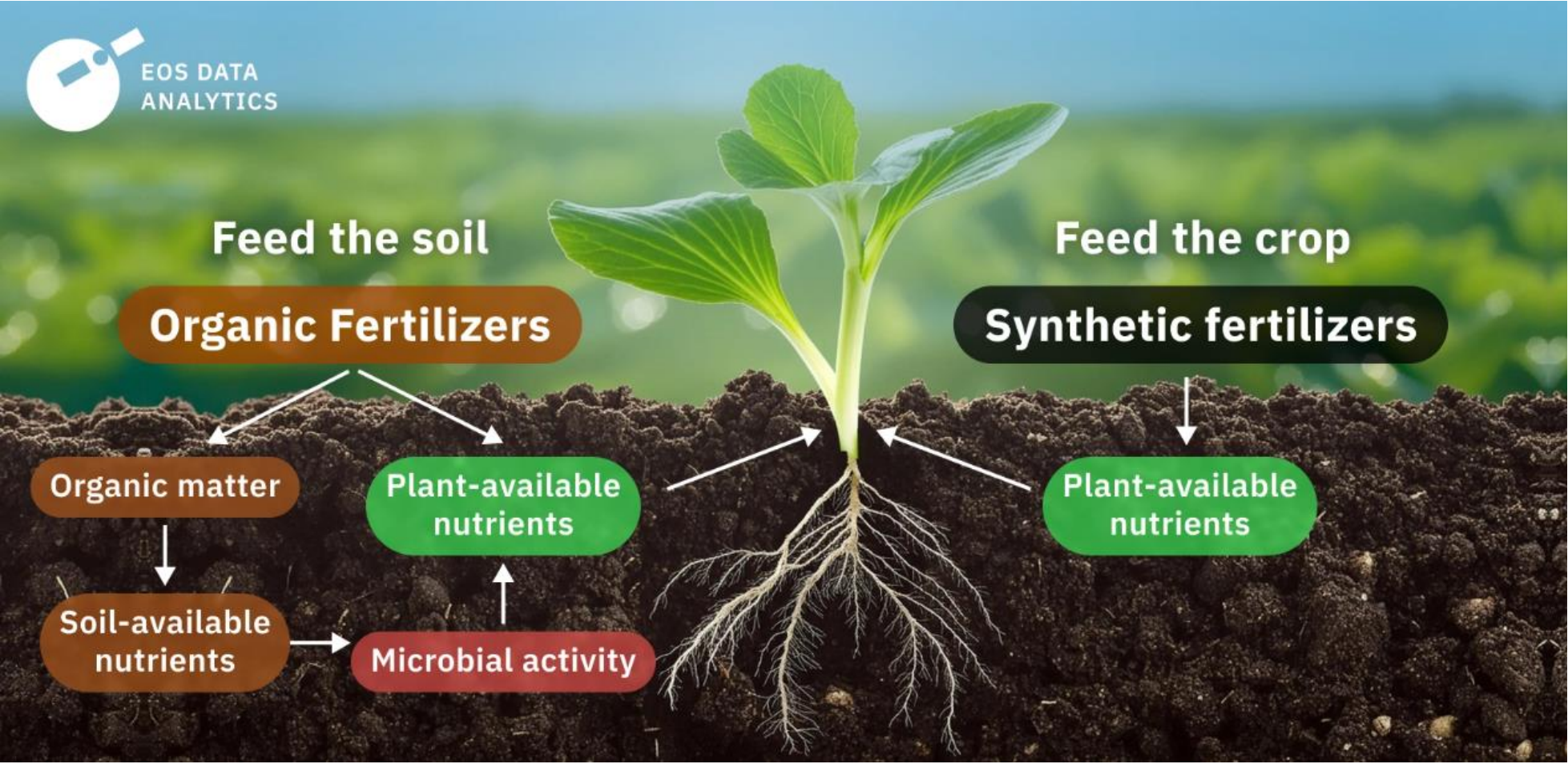
Fertilizers
Solid organic fertilizers
 2,5% N
 2% P₂O₅ or K₂O
 OR
 1% N
 1% P₂O₅ or K₂O
 To a total of ≥ 4%
AND ≥ 15% C org

Soil improvers Amendments
Organic soil improvers
95% material of solely biological origin

Inorganic soil improver
 Other than an organic soil improver

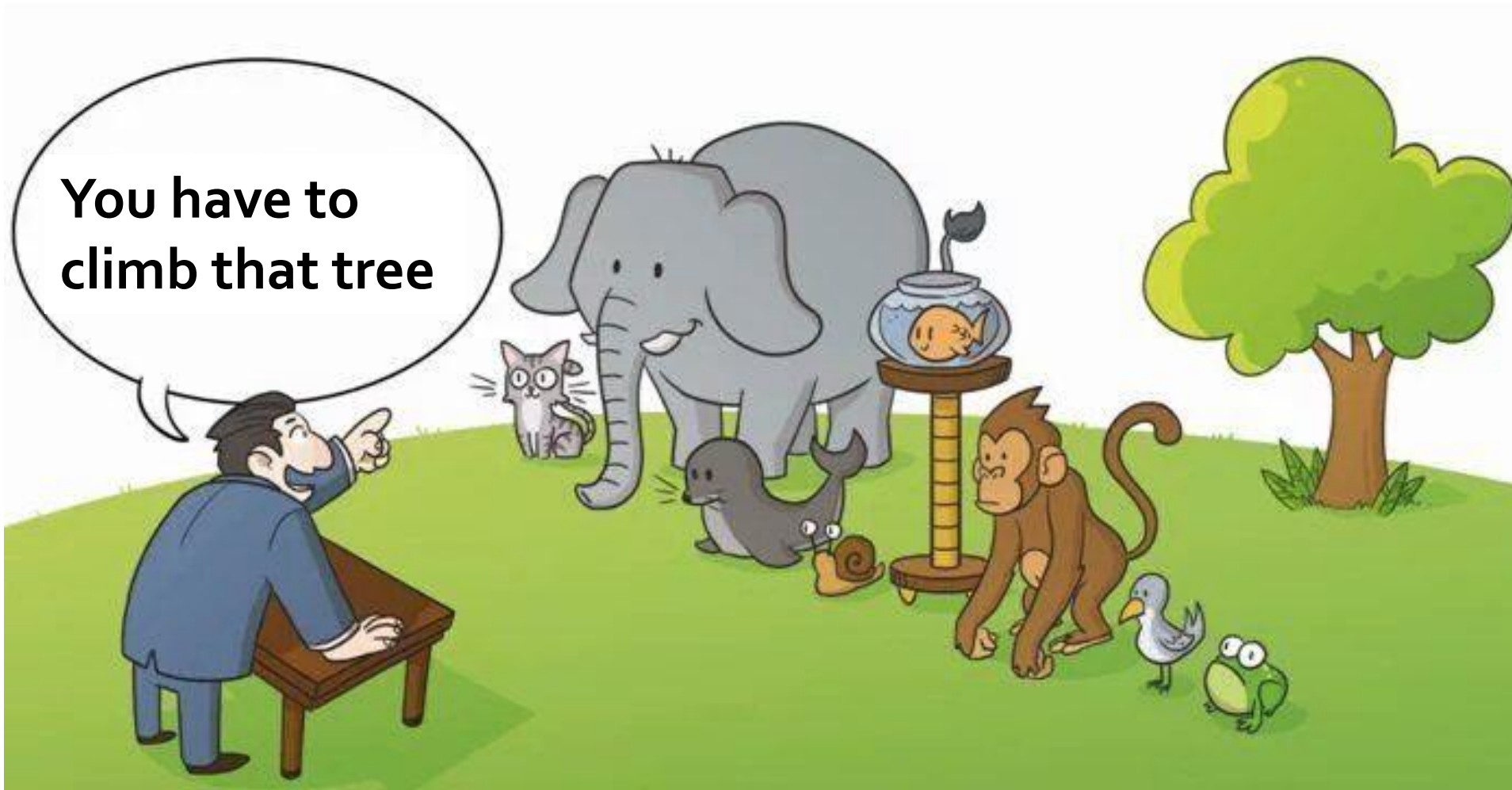
EU 2019/1009
 *: All percentages are weight/weight

The true function of circular fertilisers



<https://azmsbl.com/?s=organic-vs-synthetic-fertilizer-pros-cons-and-which-to-tt-DRA65SgCbl>

The true function of circular fertilisers

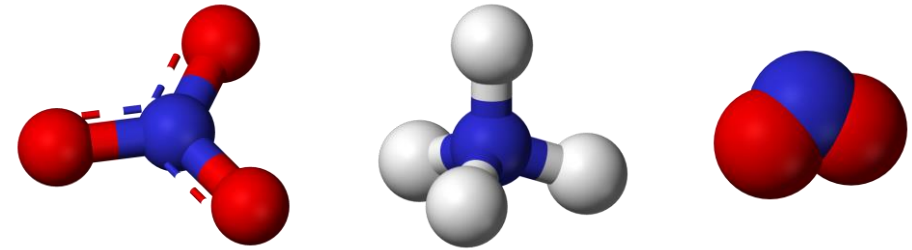
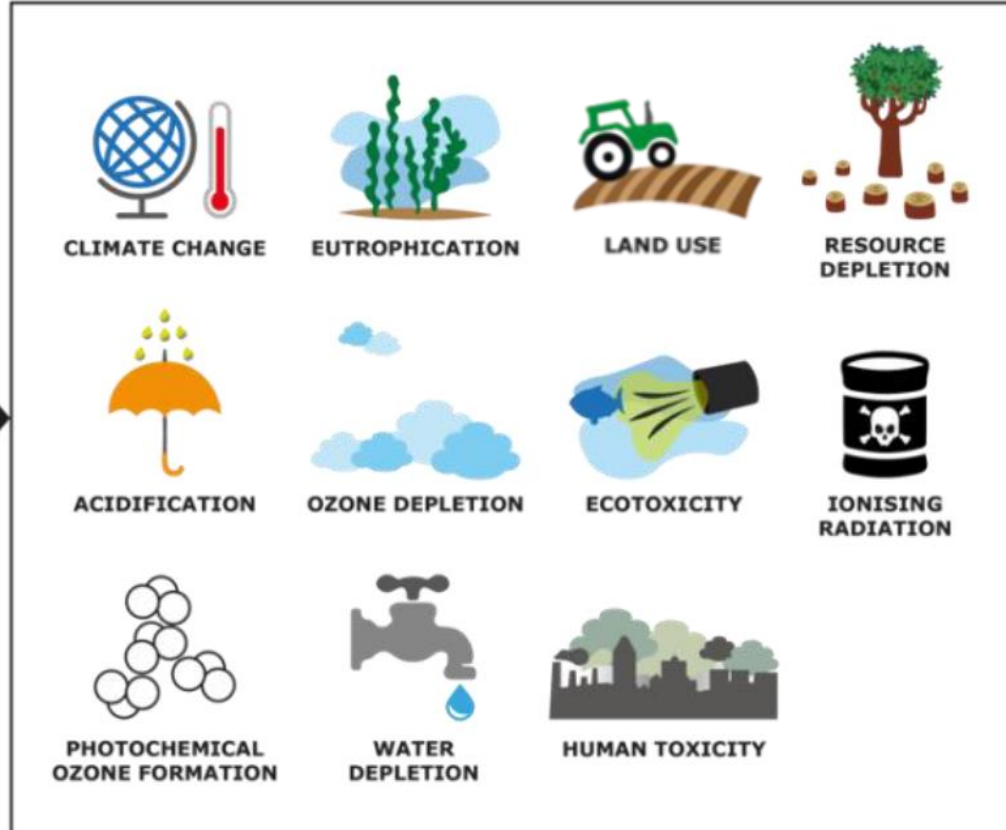


The scope of LCA methods



The scope of LCA methods

LCIA - Life Cycle Impact Assessment



Differences in molecules



Not accountable without specific emission factors

Theory:

"Damage to biodiversity (...), erosion resistance, mechanical filtration, groundwater regeneration and biotic production".

Practice:

Land occupation and its associated CC impact.

<https://eplca.jrc.ec.europa.eu/lifecycleassessment.html>

LCC vs. other economic analyses

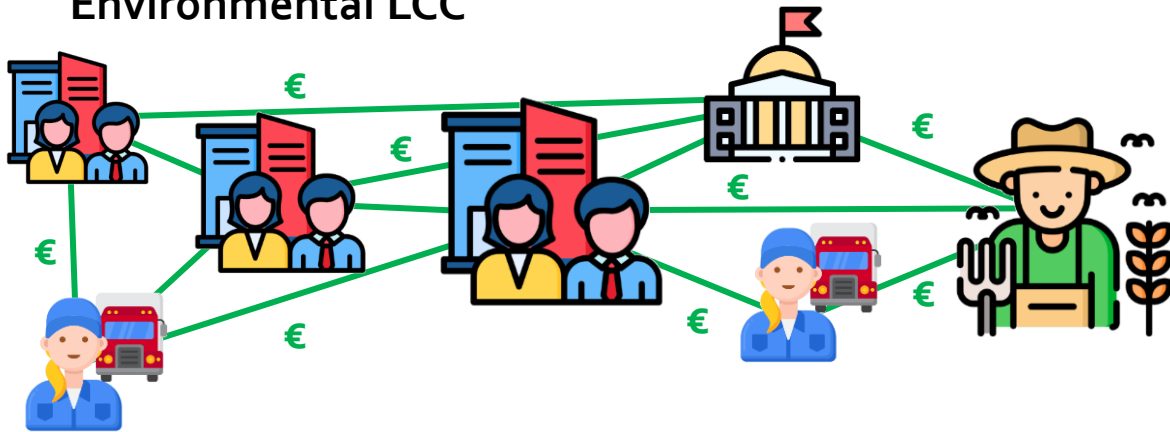


LCC vs. other economic analyses

Corporate LCC



Environmental LCC



Cost-benefit analysis (CBA)

Weights the benefits of an initiative against its costs.

Cost effectiveness analysis (CEA)

Compares 2 options based on its associated costs.

Eco-efficiency analysis

Weights the environmental impacts against its economic value.

Sustainability-adjusted rate of return (SROR)

Adjust the return rate with environmental social risks/benefits.

Natural Capital Accounting (NCA)

Measures the value of ecosystems, integrating it in decisions.

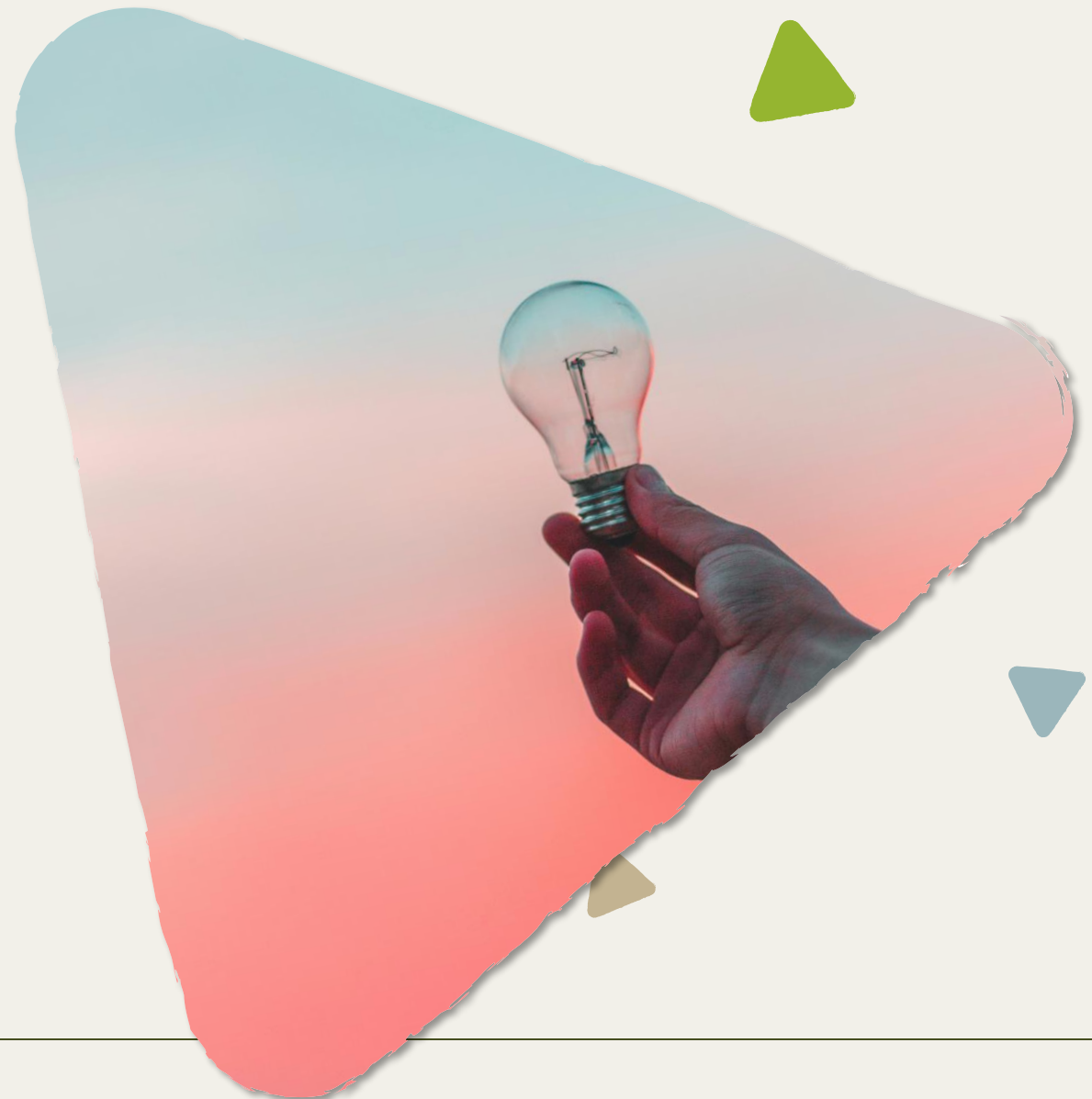
Eco-costs

Translates environmental impacts (LCA) into monetary values.

External Costs Analysis

Calculates not internalized environmental and social costs.

Final thoughts



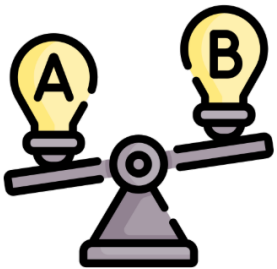
Final thoughts



No such thing as *one size fits all*.



All assessment tools have blind spots.



Baseline and functional unit selection are crucial.



Complement LCA with other tools bridging key gaps.

Advance emission factor research.

Monitor real-life effects.

Downscale data as much as possible (granularity).

Thank you for your attention

