How LCA-based innovation approach can lead to breakthrough solutions, whatever the TRL?

Congrès avniR 2017
17-11-08– LCA along the TRL scale
Quentin Bézier – Élise Monnier
Planetary Boundaries: the planet at risk on 4 axes

Steffen et al. 2015
We need ambitious targets: Factor 10

We must do more with less

Factor 10 is WBCSD’s circular economy program. It brings companies together to reinvent how business finds, uses and disposes of the resources and materials that make up global trade. It will bridge the gap between theory and practice to help companies identify and remove barriers and create scalable solutions.

By collaborating on solutions that go beyond business as usual, Factor 10 will help deliver high-impact, large-scale results where resources are used wisely, processes create the greatest possible value and nothing is wasted.

It is the global business collaboration delivering innovative, scalable solutions for the circular economy.

Join Factor 10
Eco-innovation is part of the answer

- Optimisation
- Eco-innovation
- New business model

Eco-value

- Materials and components
- Architecture of product
- Technological breakthrough
  - New usage

Time and scale of change

Gingko 21 after Rathenau Institut
LCA along the Stage Gate process
Example: breaking the sustainability frontier
Flyknit sport shoe by Nike

LCA identified trimming of the sole and glue as main environmental hot spots.
Breakthrough innovation: shoe and sole are knitted at once

creating customer value by
increasing comfort and running performance

creating business value by
cutting production time and
costs, and addressing
mainstream customer needs
with significant market
potential

creating system-wide
environmental and social value by
reducing landfill waste and
reducing the need for labor-
intensive, low wage work

« Sustainability Oriented Innovation »
Promoted by MIT and the Sloan Management Review
Breaking the sustainability frontier

The Impact/Performance Frontier (MIT Sloan Management Review, 2015)
How to achieve eco-innovation? OpenGreen®, a time-tested methodology
Example: Eco-Innovation of an intelligent energy storage at CEA

“SETI” Technology

Use investigation
=> Risks of improper use because of the system complexity

Imagine the life cycle
=> Installation and maintenance highly influence the use efficiency

Environmental impacts?
=> Maximize benefits of the use to make life cycle impacts negligible

Rephrase the eco-innovation issue
How to make SETI
- Simple to use over its whole life cycle
- While being efficient?

Generate ideas
Group creativity
Cross-functional team

Results:
- 105 eco-ideas, 12 research fields, 1 technological roadmap
- Among them, a more adapted business model that will support a faster implementation on the market

Without eco-innovation:
- We would have waited till TRL 7-9 to integrate business model and breakthrough sustainability ideas
- It would have been too expensive to integrate

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Take back messages

- LCA is useful
  - all along the TRL scale and the Stage Gate Process
  - with different levels of detail
  - to ensure the product/processes under development have a better environmental performance

- LCA is also useful UPSTREAM
  - to feed the innovation funnel with new ideas
  - from PASSSIVE sustainability to ACTIVE sustainability

- LCA + Innovation tools along the TRL scale
  - help supplementing an eco-concept, ensure it reaches the accurate market
  - while enhancing environmental performance
Any questions? Please ask!

Prepared by

Quentin Bézier
06 19 58 75 97
quentin.bezier@gingko21.com

Hélène Teulon
06 10 07 25 62
helene.teulon@gingko21.com

Élise Monnier (Naveaux)
04 38 78 02 28
elise.monnier@cea.fr

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