CASTLE
Careers in Sustainability Excellence

CASTLE project has received research funding from the European Union

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Assessing business sustainability practices

Methodological guidance in simplifying LCA and evaluating triple bottom line principles

Barcelona, 21 October 2015

What is triple bottom line thinking?

Life Cycle Costing (LCC)

Social Life Cycle Assessment (SLCA)

Life Cycle Assessment (LCA)

LCSA = LCA + LCC + SLCA

What are the needs of (small) business?

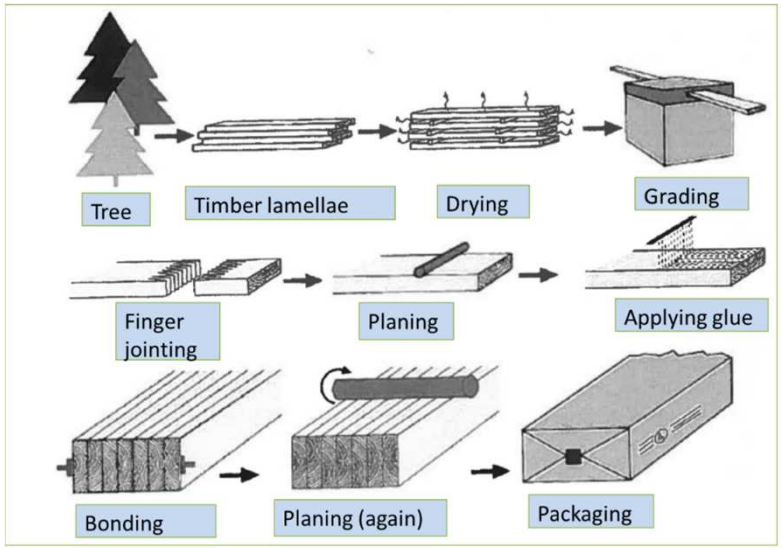
- To understand the value chain of their product
- To comply with State and EU regulations
- To determine ways to save money
- To determine ways to develop and deliver a quality product
- To determine the ways their product may benefit the community (is there a need for this product?)
- A simple way to assess their products

Reasoning for simplification

If the key parameters affecting product impact can be determined, SMEs can concentrate on reducing the impact of these parameters to reduce their overall impact.

Jantoo.com

Case study: Glulam LCA



Schematic of glulam production. Adapted from Sara Farlin (2009)

Problem

LCA can be an extremely valuable tool. However, it is often:

- expensive,
- time consuming,
- complicated

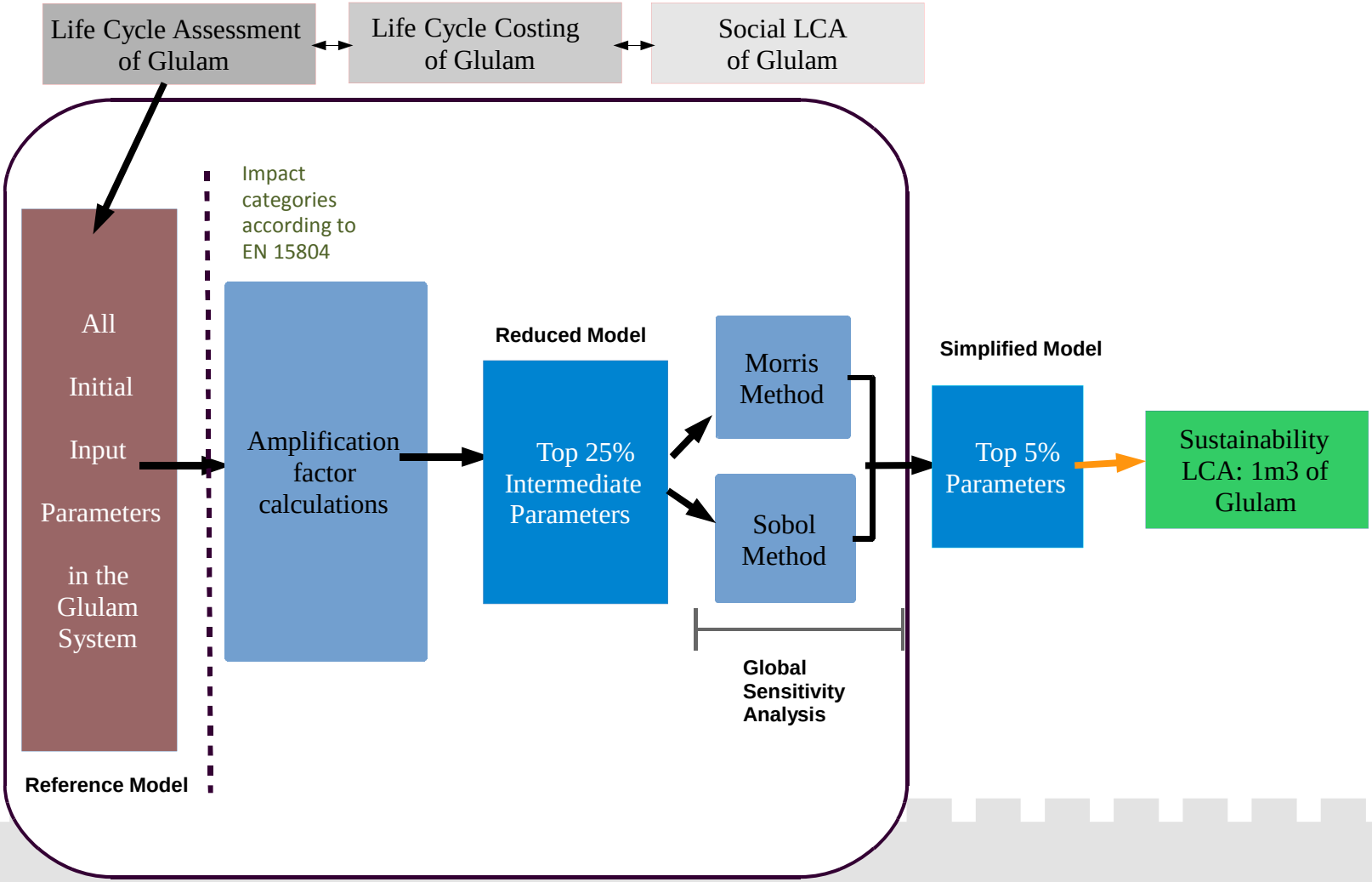
Simplification -> input level =

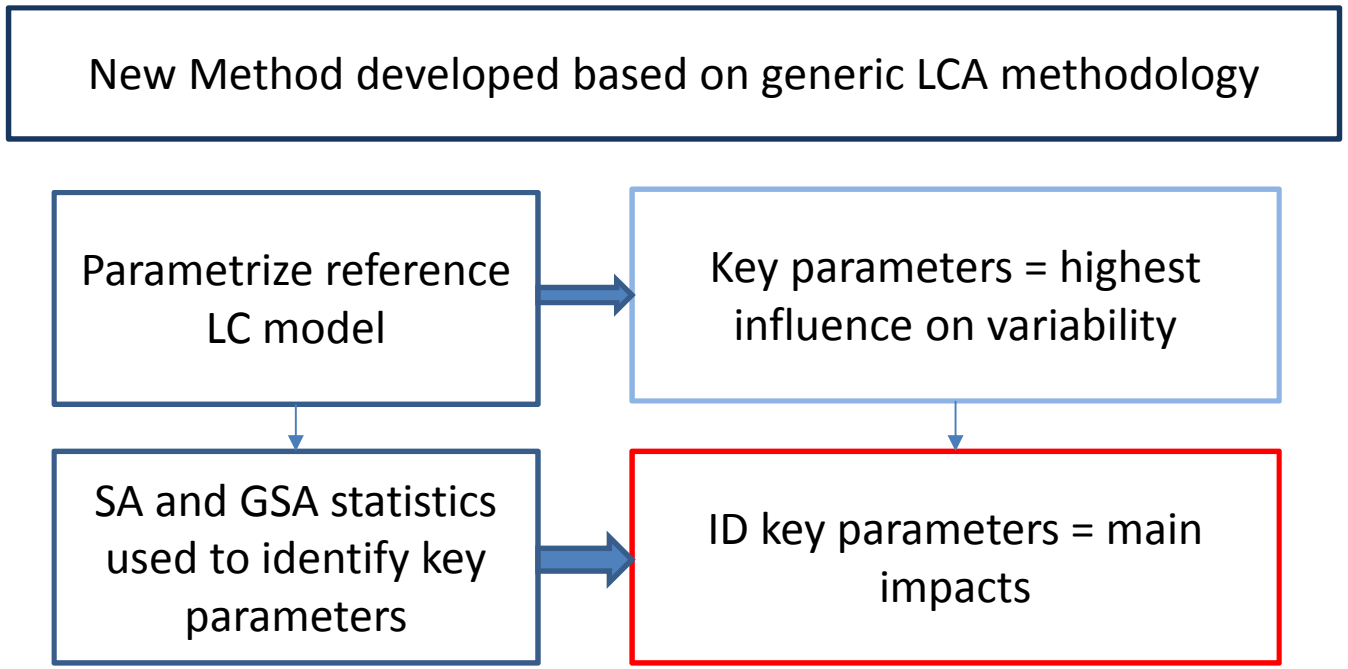
Complexities ->output level

Proposed Solution

- simplified methodology,
- applicable within the constraints of SMEs,
- which can exploit a previously accomplished LCA model based on defined parameters, and then…
- determine the environmental impact of similarly characterized products.

⇨ Simplification provides insight into a system's behavior. In this simplification, the goal is to connect cause with effect; input to output variance.


Life Cycle Assessment of Glulam
Life Cycle Costing of Glulam
Social LCA of Glulam
All Initial Input Parameters in the Glulam System
Reference Model
Impact categories according to EN 15804
Amplification factor calculations
Reduced Model
Top 25% Intermediate Parameters
Morris Method
Sobol Method
Global Sensitivity Analysis
Simplified Model
Top 5% Parameters
Sustainability LCA: 1m3 of Glulam


New Method developed based on generic LCA methodology
Parametrize reference LC model
Key parameters = highest influence on variability
SA and GSA statistics used to identify key parameters
ID key parameters = main impacts

Scope of Project

- Reduce the number of parameters that must be dealt with in a combined LCA, LCC and SLCA
- Determine the ‘key’ parameters to a system over several impact categories
- Methodology must be generic

Summary

- The overarching objective is to demonstrate a **generic method to develop simplified LC models** that serves SMEs with the necessary toolkit to accomplish environmental, economic and social assessment of their products.

- Conducting **life cycle assessment is now a core part** of many organizations' business practices. Analyzing LCC and SLCA may benefit SMEs.

- Businesses need a **robust yet simple tool** to ascertain a relevant and holistic assessment of their products.

Thank you!

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