

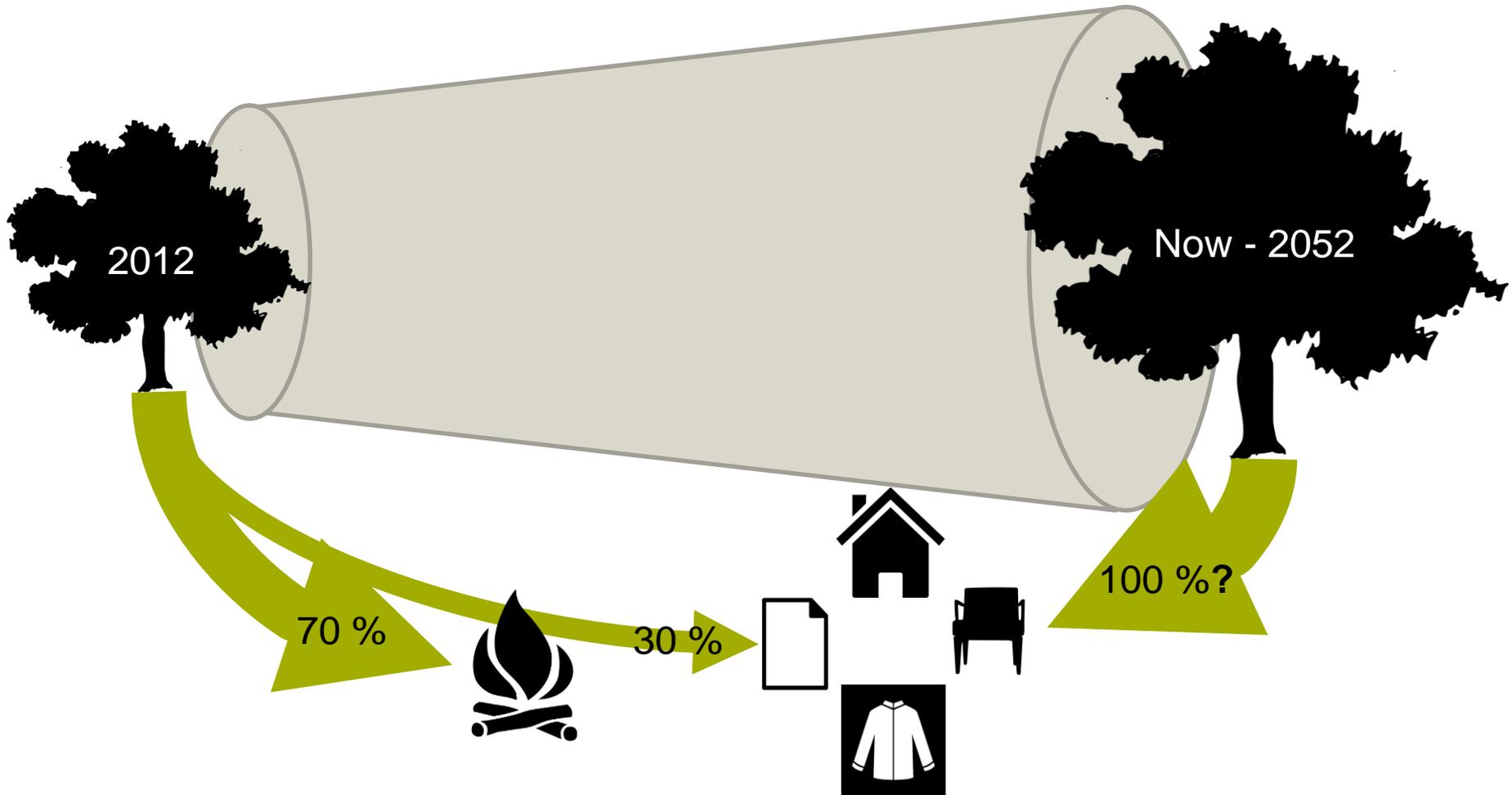
Prospective life cycle assessment of innovative hardwood products

September, 6th 2021

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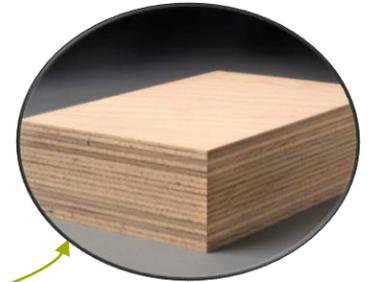
Research Group Resource Flow Management
Chair of Wood Science, Technical University of Munich (TUM)

Background



Case studies

Glulam beam
© Ralf Rosin

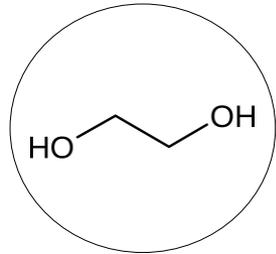


Laminated veneer lumber panel
© Ralf Rosin

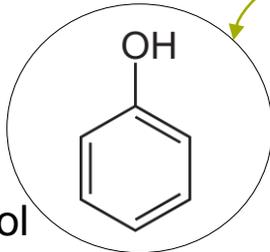


Insulation fiber board
© Vladuck 2007

Viscose for textiles
© Ralf Rosin



Monoethylenglycol



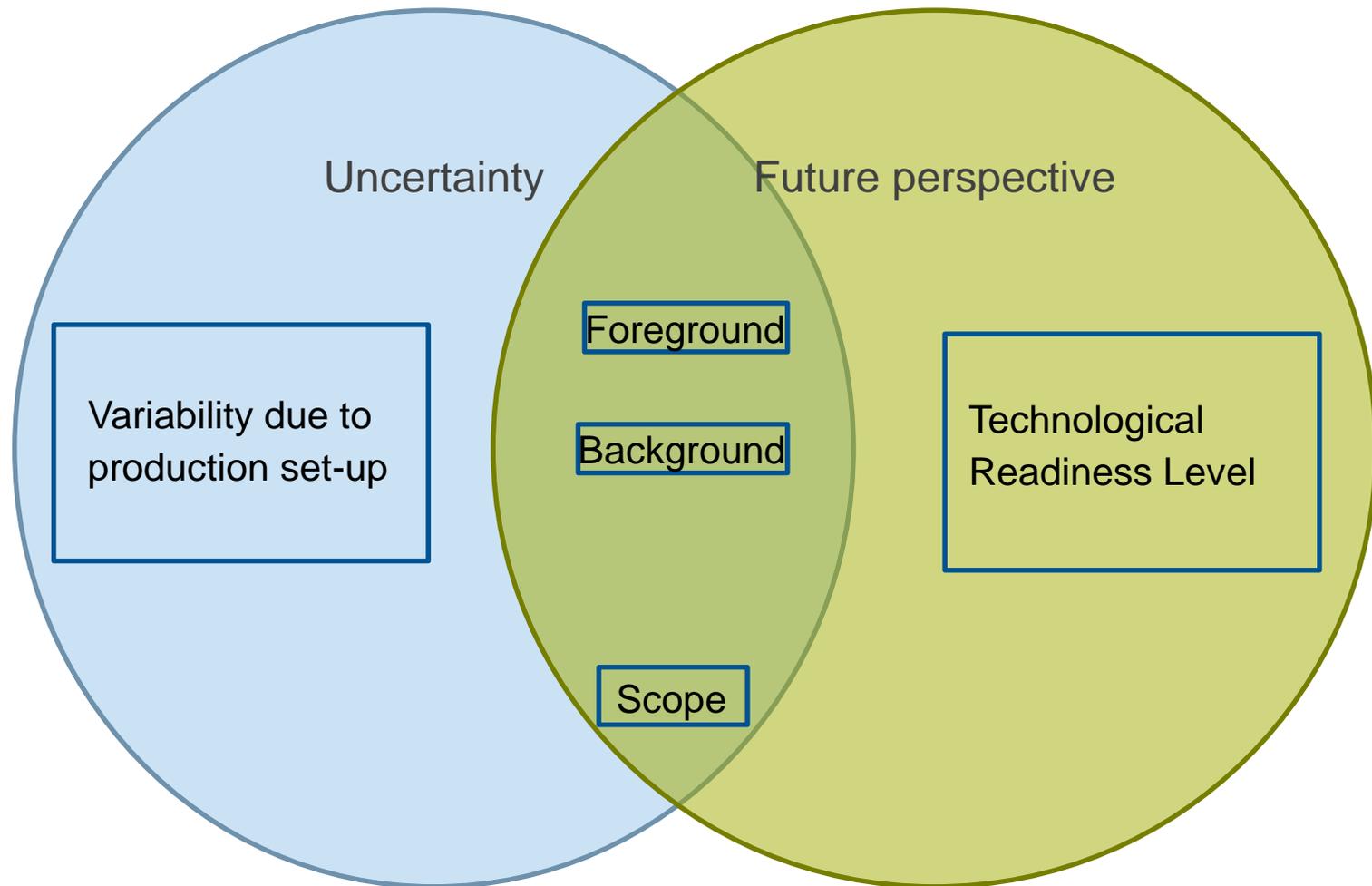
Phenol
© NEUROtiker 2007



Carbon fiber
© Arnoldius 2013



Problem statement



1. Which are the input parameters/scenarios that have the highest potential to change the final results?

2. How do these input parameters/scenarios potentially change in the future?

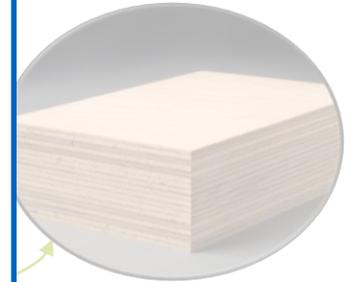
Case studies

Glulam beam

© Ralf Rosin



© Ralf Rosin



LVL panel

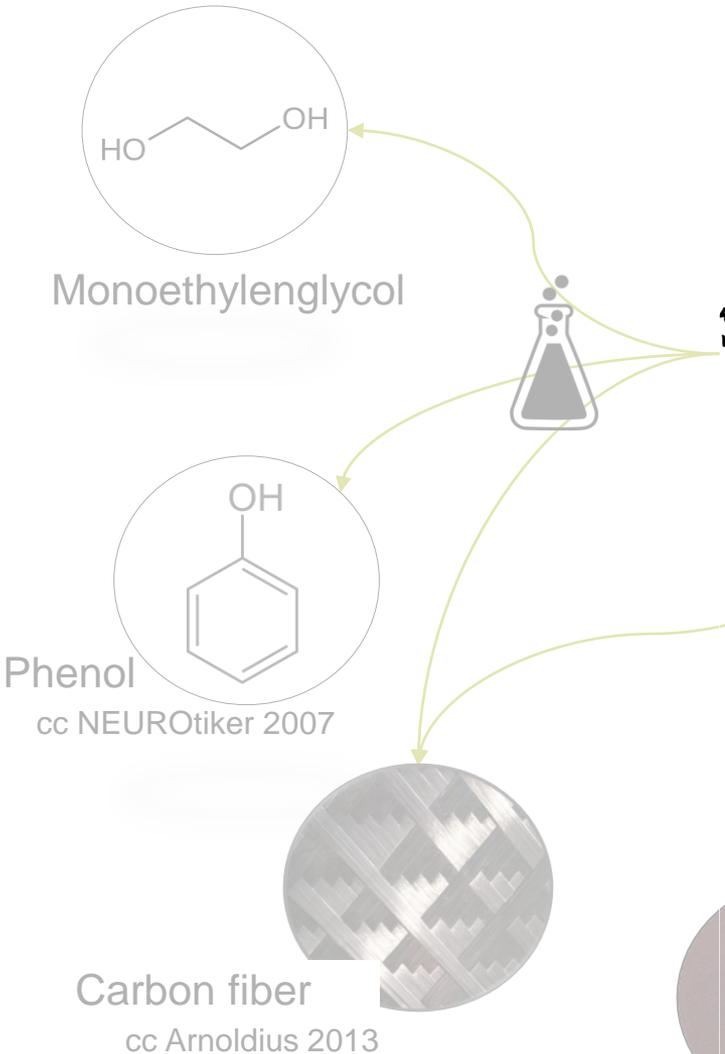
© Ralf Rosin



T-shirt

100 % viscose

© Ralf Rosin



Monoethylenglycol

Phenol

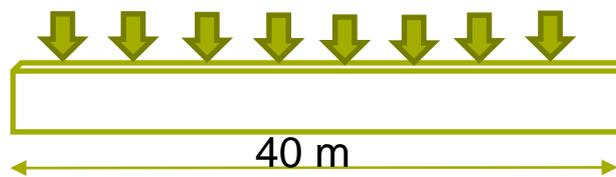
cc NEUROtiker 2007

Carbon fiber

cc Arnoldius 2013

FU

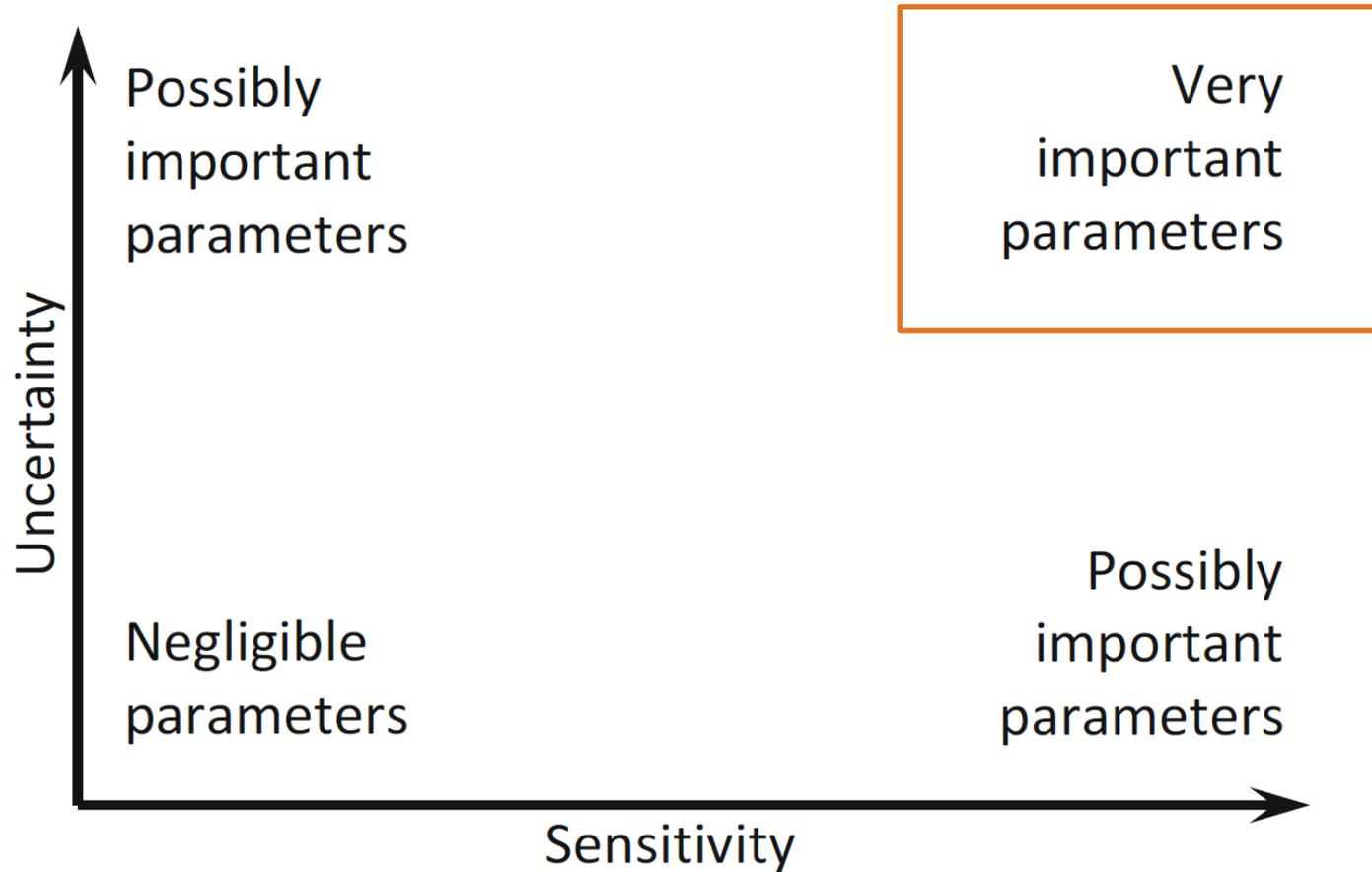
1 N/mm



Data:

ecoinvent cut off 3.7.1 +
primary data for hardwood

Method: key issue analysis

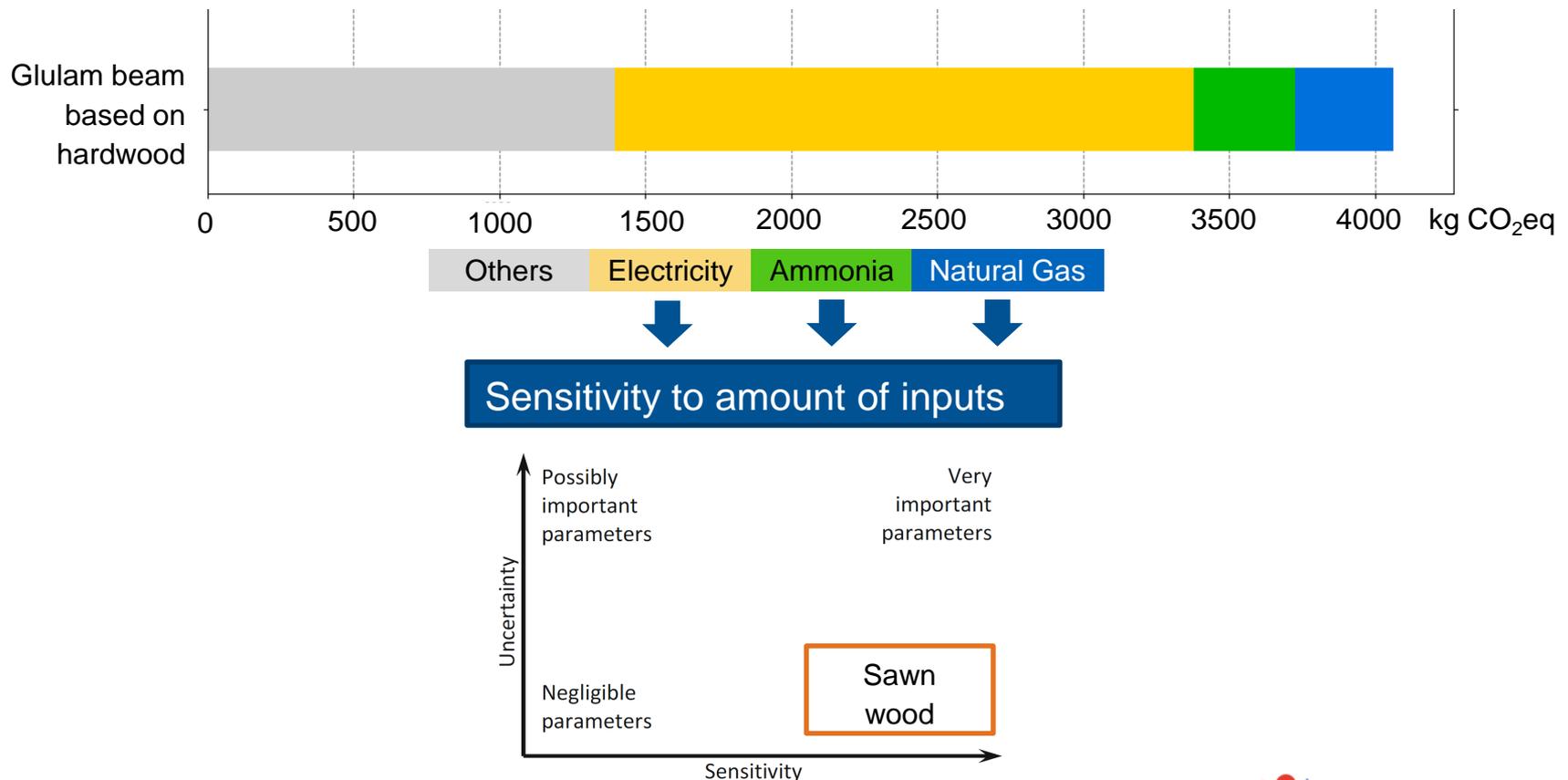


Rosenbaum et al. 2018

Hot-spots in impact categories

Climate change, cut-off at 4 % contribution (without biogenic balance)

LCIA method: ReCiPe Midpoint (H) w/o LT (obsolete) – GWP100

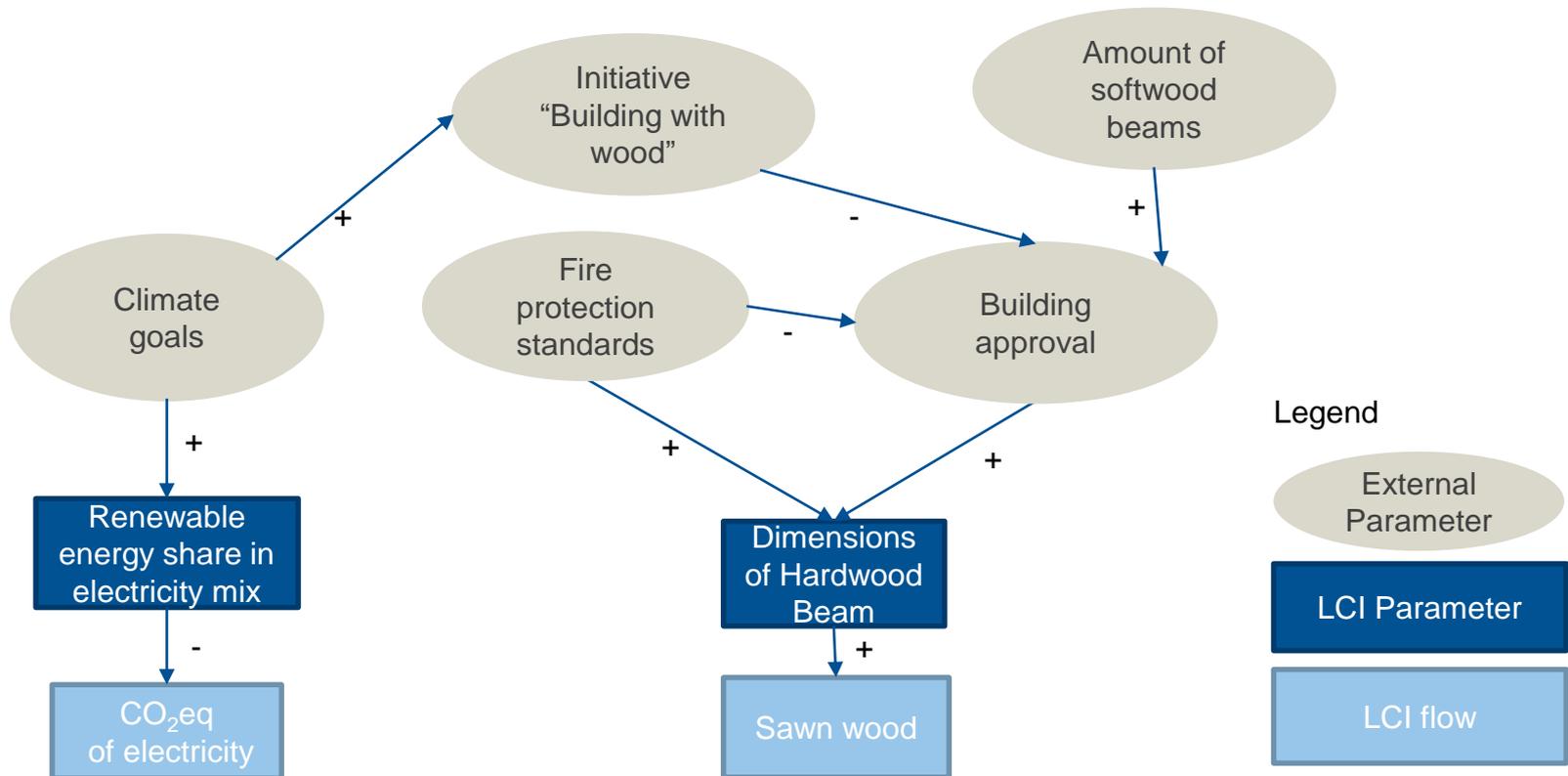


Uncertainty Analysis - Casual loop diagram

Legend

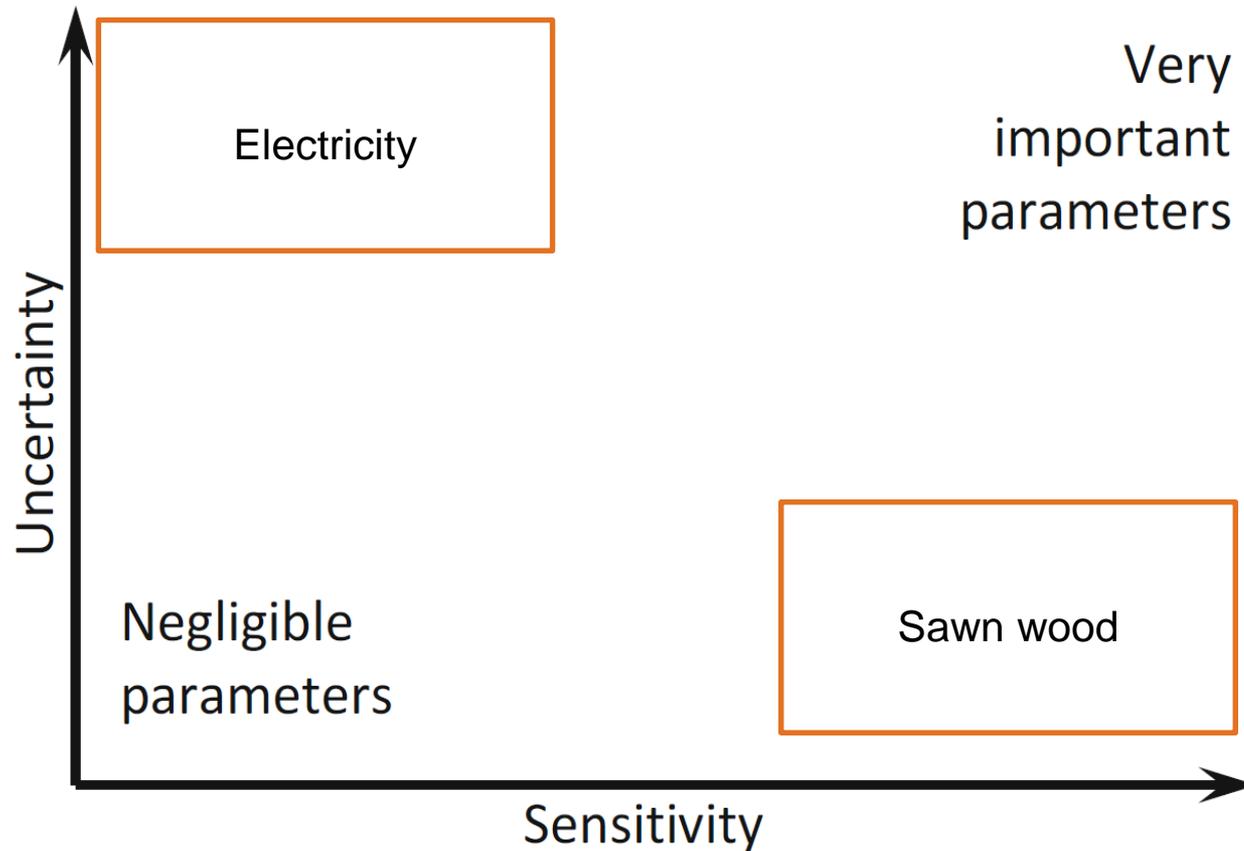
+ = More of A causes more of B/Less of A causes less of B

- = More of A causes less of B/Less of A causes more of B



Hot-spots in highest impact categories

Sensitivity to amount of output



Conclusions

1. Which are the input parameters/scenarios that have the highest potential to change the final results?

Raw material: sawn wood input
Emissions of electricity mix

2. How do these input parameters/scenarios potentially change in the future?

Both are rather reduced in possible future scenarios

Recommendations of action

- Reduction of parameters to consider
- Uncertainty of these parameters is included
- Do feedback loops!

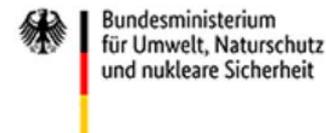
Thank you!

References can be provided upon request (E-mail: sander-titgemeyer@hfm.tum.de)

Project partners

- Bavarian Forestry and Wood Cluster Initiative GmbH
- .bwc management consulting GmbH
- Chair of Forest and Environmental Policy, TUM

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