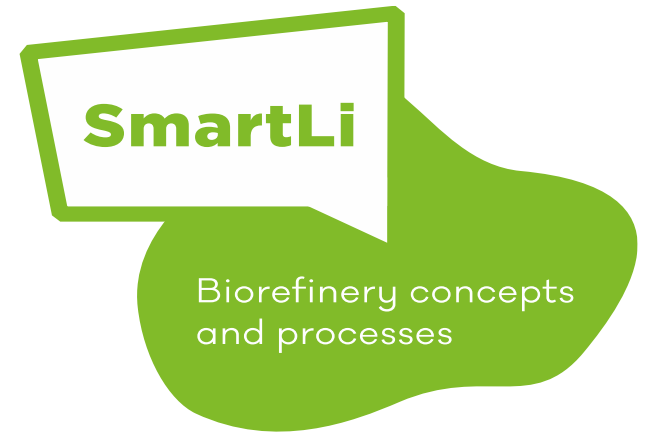
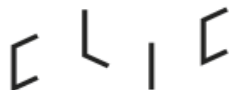


# Smart Technologies for the Conversion of Industrial Lignins into Sustainable Materials



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Wood K plus  
Team Marktanalyse und Innovationsforschung  
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**WOOD**  
KPLUS

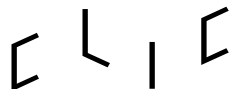
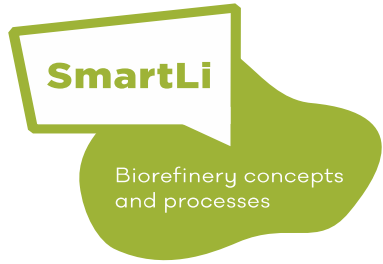


Solution Architect for Global  
Bioeconomy & Cleantech Opportunities

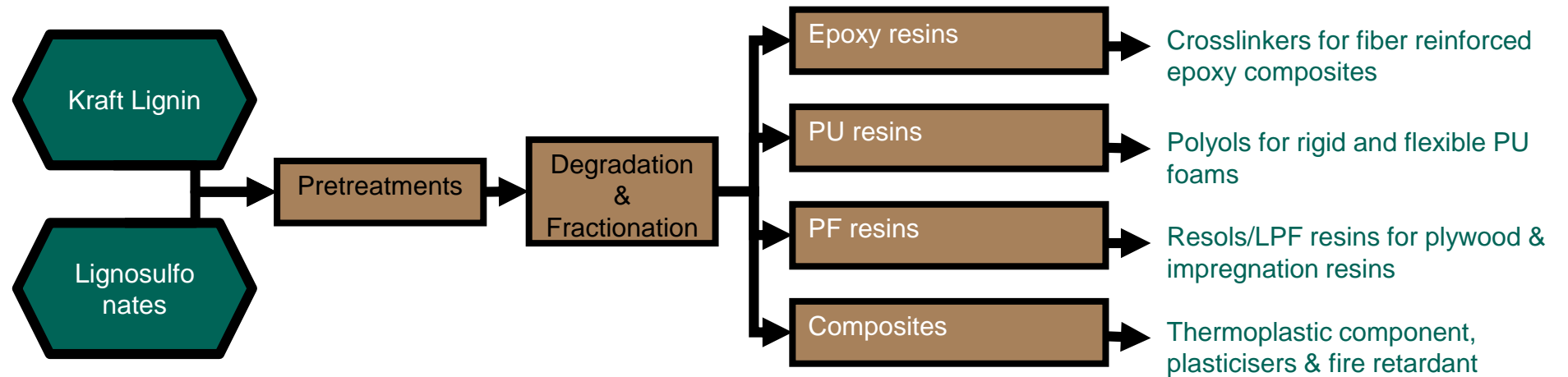


 **Bio-based Industries**  
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# SmartLi - Projektüberblick



## Ziel:

Neue Technologien (Prozesswege) zu entwickeln um Lignin zukünftig verstärkt stofflich zu nutzen

## Projektpartner:

Tecnaro/AEP/Fraunhofer/VITO/Metsä Fibre/VTT/Sappi/ Foresa/WOOD K Plus/ Prefere Resins/Kotkamills/Andritz

## Projektdauer:

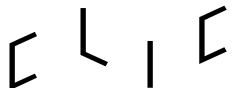
Juli 2015 – Juli 2018

## WP4: Bewertung der neuen Technologien und Produkte

- Life Cycle Assessment (LCA)
- Techno-ökonomische Analysen (Marktperspektive)

SmartLi

Biorefinery concepts and processes



# SmartLi – Life Cycle Assessment (LCA)

LCA **addresses** the environmental aspects and **potential environmental impacts** (e.g. use of resources and the environmental consequences of releases) **throughout a product's life cycle** from raw material acquisition through production, use, end-of life treatment, recycling and final disposal (i.e. cradle to grave)

Emissions to air, water and soil



Resource production

S1: Forestry

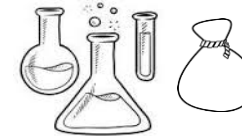


Biorefinery

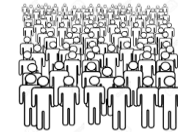
S2: Biorefinery



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Pretreatments



Biobased products

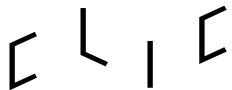
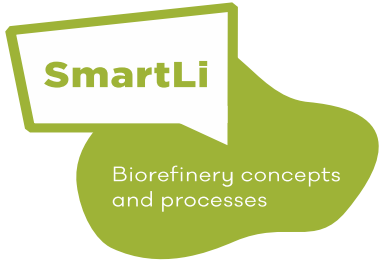


Customer

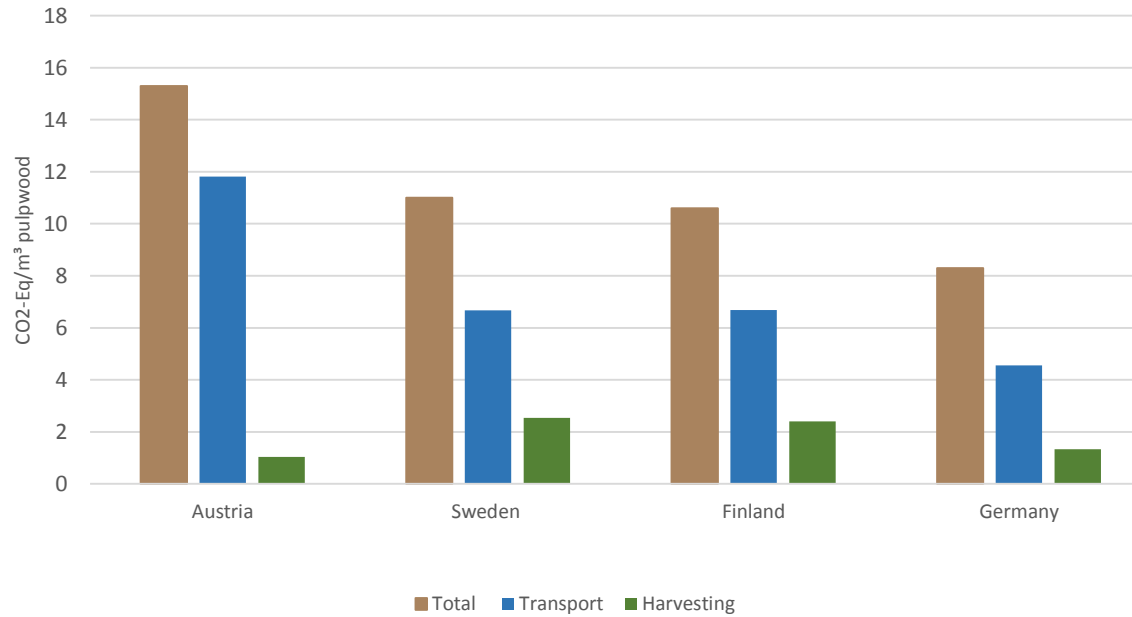


End of Life

Use phase



# S1: Resource Production - GHG emissions



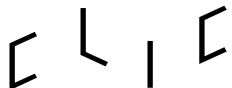
*Woher kommt das Holz?*

SmartLi

Biorefinery concepts  
and processes



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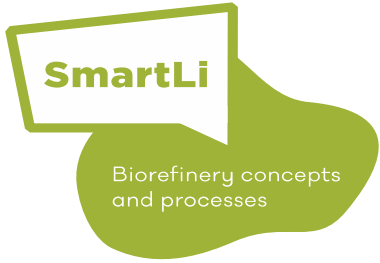


## S2: Biorefinery – GHG emissions

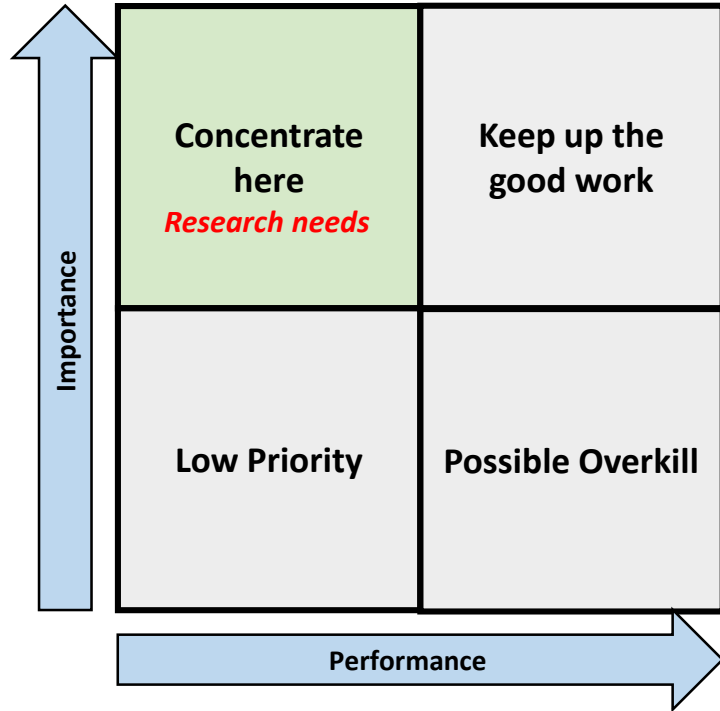
- Lignin als Nebenprodukt
- **Welche Umweltbelastungen sind dem Lignin zuzuschreiben?**
  - Ökonomisch
    - Preis für Lignin?
  - Masse

### Trade-offs?

Wenn Lignin stofflich genutzt wird,  
steht es nicht mehr für die  
Energiegewinnung in der Bioraffinerie  
zur Verfügung



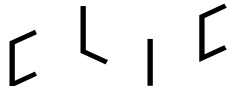
# Techno-ökonomische Analysen – GAP-Analyse

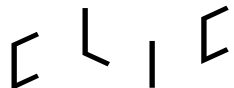
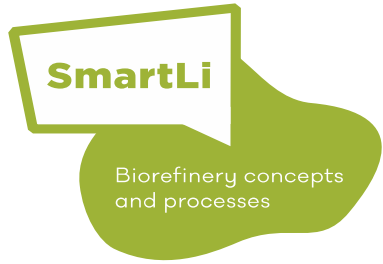


Importance-Performance Ansatz  
28 Einflussfaktoren ligninbasierte PF-Harze  
Befragung der Industrie & Forschung

Gaps zwischen Industrie und Forschung  
Barrieren und Anreizen  
Forschungsbedarf

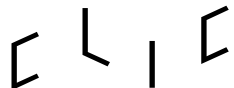
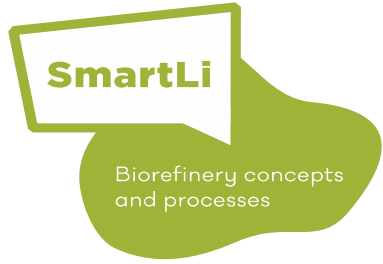
Industrie und Forschung sind sich einig, dass ein Forschungsbedarf hinsichtlich umweltrelevanter Einflussfaktoren besteht





## SmartLi - Ausblick

- **LCA**
  - Datenaufnahme für die SmartLi Technologien und Produkte
  - Vorläufige LCA Feb. 2017
- **Techno-ökonomische Analyse**
  - GAP-Analyse
  - Szenarioanalyse
  - Delphi-Analyse
- **Life Cycle Costing**
  - Ökoeffizienz ligninbasierter Produkte



**Danke für die Aufmerksamkeit!**

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