



Life Cycle Assessment
of the OSB and plywood industries in the USA

Dominik Kaestner
M.S. Candidate
University of Tennessee
Department of Forestry, Wildlife and Fisheries
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160 Plant Biotechnology Building

Project partners:  





Outline



- Introduction
- Justification
- Methodology
- Acknowledgement
- References




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Introduction – Building products




 OSB Plywood

Input →  Output → 
Result: CO₂ footprint

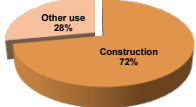
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Introduction – Product facts

Oriented Strand Board (OSB)

total production in the USA (2012):
11,038 Million Sq. Ft. 3/8" Basis
(APA, 2013)

OSB end uses in North America 2012



End Use	Percentage
Construction	72%
Other use	28%

(APA, 2012)

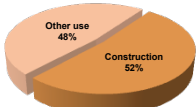
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Introduction – Product facts

Plywood

total production in the USA (2012):
9,181 Million Sq. Ft. 3/8" Basis
(APA, 2013)

Plywood end uses in North America 2012






End Use	Percentage
Construction	52%
Other use	48%

(APA, 2012)

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Introduction – Life Cycle Assessment (LCA)

- **Compiling all energy and material inputs and outputs**
- **Interpret the potential environmental impacts**



(Curran, 2006)

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Introduction – LCA concept

- **Systematic**
- **Based on a functional unit as reference unit (e.g. Sq. Ft. 3/8" Basis)**
- **Subdivided into a set of processes with system boundaries**

The diagram illustrates the Life Cycle Assessment (LCA) framework. It consists of four main stages: Goal and scope definition, Inventory analysis, Impact assessment, and Interpretation. These stages are interconnected with bidirectional arrows, indicating a continuous and iterative process. The entire framework is enclosed in a rounded rectangular box.

(ISO 14040:2006)
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Introduction – EPD

Environmental Product Declaration

- **Standardized summary of environmental impacts based on LCA**
- **Ensures a fair comparison of different products**
- **Selected impact assessment categories**

(ISO 14025:2006)

Global Warming Potential	Ozone Depletion Potential	Acidification Potential	Smog Potential	Eutrophication Potential






(IBU, 2009)
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Justification

The diagram shows a circular product life cycle centered on a globe. The stages are: Raw Materials (top), Manufacturing (right), Transportation (bottom right), Distribution (bottom), Product use (bottom left), and End of life (left). Each stage is accompanied by a small icon representing that phase of the cycle.

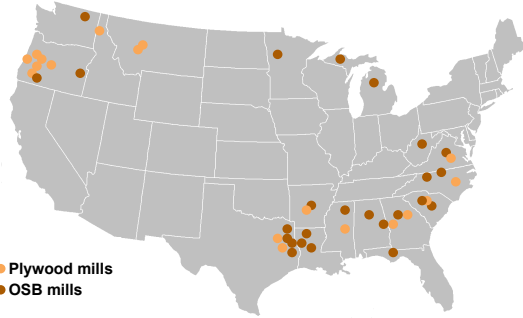
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Methodology - Project

- Mill data collection 
- Data quality check 
- Evaluation of the collected data with SimaPro 
- Report life cycle inventory (LCI) average data 
- Analysis of changes in the industry over time 

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Project - Survey Targets



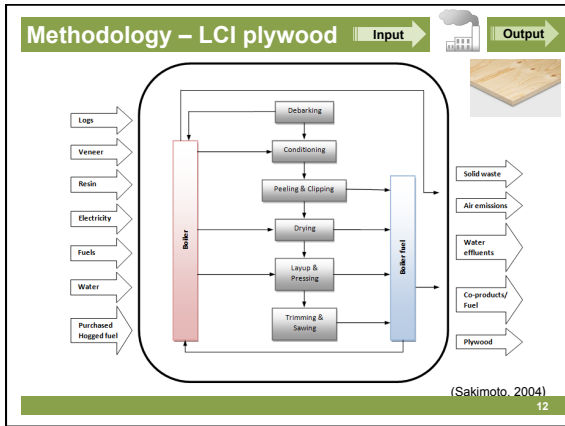
● Plywood mills
● OSB mills

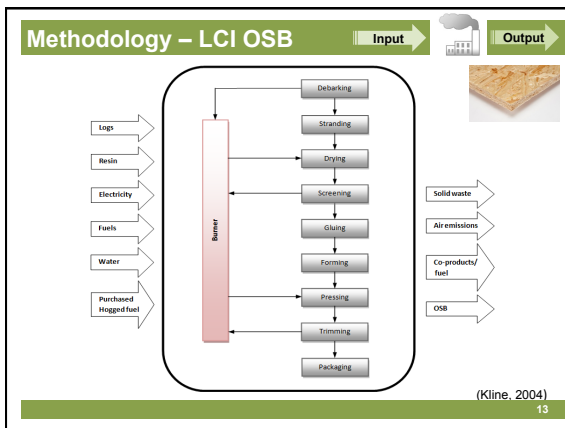
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Project – Survey year 2012


➤ Log volume consumption	Board Feet	
➤ Plywood production	MSF 3/8 inch basis	
➤ Transportation methods	Average distance	
➤ Other material inputs	Packaging material	

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Methodology – Statistical Analysis



- > Compile LCI data
- > Calculate impacts
- > Analyze the process for 'hot spots'



- > Production-weighted average values
- > Variability estimates
- > Analyze the changes in the industry

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Acknowledgement



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Renewable Industrial Material**

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Picture Source

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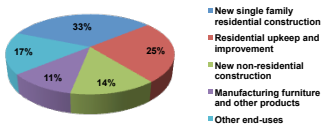
Any Questions ?



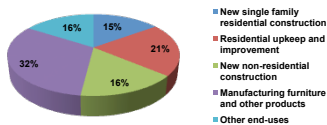
Now or later dkaestne@utk.edu

Figures end uses in North America 2012

OSB end uses in North America 2012

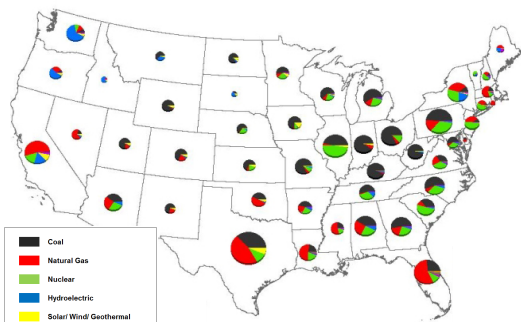


Plywood end uses in North America 2012



(APA, 2012)

Electricity generation sources 2010



(eia, 2013)

