

Contribution of the Austrian Forest Sector to Climate Change Policies

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Industrial Marketing Implications

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Wood
K plus

Network Organization

Wood K plus is a research Network of four universities and 16 corporate partners, each of them providing research locations and equipment.

The four **technical research areas** are located in Lenzing, Linz, St. Veit/Glan and Vienna.

The **cross sectional market research area** is situated at the University of Natural Resources and Applied Life Sciences, Vienna, Department of Economics and Social Sciences, Institute of Marketing & Innovation.



Solid wood & wood composites VIENNA	Surface technology and logistics St. Veit/Glan
Wood-polymer-composites LINZ	Wood- and pulp chemistry LENZING
Market research and wood industry policy	

Objectives

Carbon storage in Austrian wood products:

- Methodology, data availability & problems
- Results, implications & recent developments



The industrial research point of view:

- Implications on marketing and competition



Carbon storage in HWP in Austria

Examples

Wimmer (1992): Can increasing wood consumption help to mitigate the CO²-problem in Austria?

Baur (2003): The possible contribution of the Austrian Forest Sector to climate change policies and implications to the Kyoto-Protocol

- There is a tradition in carbon sequestration research
- We have a good base for further research
- So far the development of HWP related research was rather slow

Methodology

Not talking about biosphere, we start at the „technosphere“ when wood is harvested in forests.

In order to analyze storage effects a stock-change approach is used (Wimmer, 1992; Baur, 2003).

So far input-output methodology was used.

It includes:

- Determination of consumption and application of **HWPs**
- Assumption of the according life spans
- Conversion factors to calculate C-content
- Energy used in production processes (Wimmer,1992)

Data availability

For the calculation of carbon storage in HWPs the availability of data is a key issue. Austrian studies used:

- **Annual report on harvests by the ministry**
- **FAO Statistical Data base (Production-Import-Export)**
- **„Konjunkturerhebung im produzierenden Bereich“ and “Gütereinsatzstatistik” from Statistik Austria**



The last provide detailed data on a final product base. Therefore it allows to assume the most likely application.

Problems

- **Data problems regarding „Konjunkturerhebung“ and „Gütereinsatzstatistik“**
- **Carbon stock in wood products**
- **Wood from different species (density 0.41-0.74 cm/t)**
- **Water content in wood (10% - 28%)**
- **Application of wood products**

Definition of long term products

- **Newsprint (0.2-1 year)**
- **Furniture (10-30 years)**
- **Houses (30-75 years)**



Results

32.5 mio tons of carbon in long term products - this is equivalent to the double Austrian annual emission of CO² (Baur, 2003).

Carbon stored annually in long term wood products:

- **0.6 million tons (Wimmer, 1992)**
- **1.1 million tons (Baur, 2003)**

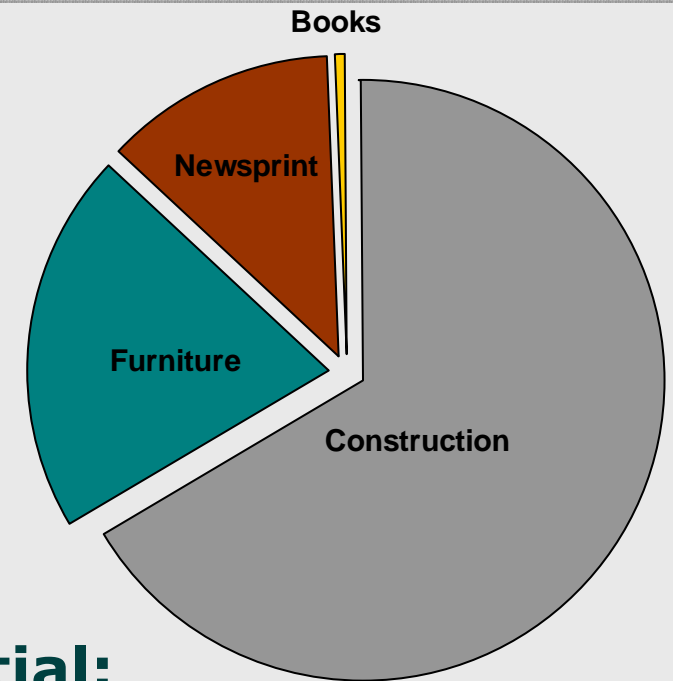
Doubling the annual consumption of wood products would reduce the annual emissions by 4.3% (Baur, 2003) to 6% (Wimmer, 1992).

How realistic is this assumption?

Carbon storage by application

According to Baur (2003):

- Construction 0.8 mio t of carbon
- Furniture 0.2-0.3 mio t of carbon
- Books 0.007 mio t of carbon
- Newsprint 0.15 mio t of carbon



Hence, the construction sector is essential:

During the last 10 years wood use in construction increased in Lower Austria by 16% in terms of buildings and by 4% in terms of space (Stern & Huber, 2008). Assuming similar values for the whole country, this would result in an additional storage effect equal to approx. 0.5% of the annual emissions.

Targets in 1992

In order to improve carbon storage effects Wimmer (1992) suggested:

- Utilization of wood waste for energy
- Improvement of wood products life span
- Increase wood utilization in construction
- Recycling of wood products
- Reduction of wood imports - intensify harvesting
- Improvement of tree growth
- Substitution of other materials by wood
- Development of new wood applications

Recent Developments I

- Utilization of wood for energy is massively increasing but it limits the material use (Schwarzbauer & Stern, 2008).
- Technology to increase wood products life span has been developed (e.g. wood modification, wood composites) but this is not sufficient in terms of carbon sequestration.
- ! As mentioned before the wood utilization in construction has increased but the extent is still not overwhelming.
- ! Paper recycling is very popular in Austria reaching almost 70%.
- The panel industry uses about 10% recycled wood for production. Other wood products are partly used for energy production.
- ! Roundwood imports to Austria grew constantly. If at all the imports may stagnate or fall in the future this will be a consequence of increasing demand in the neighboring countries. Anyhow Austria was also successful in increasing harvests from domestic forests (12 to 21mio cum).

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Recent Developments II

- ✓ A systematic improvement in tree growth is unlikely as silviculture tends towards more natural and stable stands which have lower MAI (Mean Annual Increment).
- ! Substitution of other materials will continue in the construction sector, may also happen in furniture production and other application fields.
- ! The development of new wood applications is supported by the wood biorefinery concept and the introduction of bioplastics based on wood as raw material (Hirth, 2008).

National accounting methods so far lack to include substitution effects!

Why should the industry focus on this?

We see two major fields of interest:

- **First, carbon sequestration certification and labeling of long-term wood products and its implementation for the consumer in order to support wood utilization and substitution of other materials.**
- **Second, analysis and development of cross industrial partnerships in order to implement an optimized emission management.**



Lessons to be learned from certification

Much relevant research on this topic exists in the field of wood certification. We think that the development of wood certification (regarding sustainable forest management) shows many analogies to what can be expected in context with carbon sequestration.

Hence, learning from the past can be applied by carrying out a meta-study on consumer response to wood certification.



So far, we investigated a total of 27 studies from 1995 to 2007 including 39 surveys covering about 33,000 observations from all over the world.

Results on Consumer Acceptance

Concerning environmental labelling:

- **55.6% (SD +/-14.8)** of the consumers declared a willingness to pay premiums.
- Two test market surveys indicated **33.4% (SD +/-4.9)**.
- Therefore one third of consumers may perceive additional value from certification that exceeds the one of buying cheap.
- The proportions of consumers stating a willingness to pay were found to be highest in the year 2000. **The behaviour observed correlates with the world economy (OECD, 2008).**
- The proportions of respondents stating a willingness to pay were lowest for shelving boards & racks followed by houses.



Results on WTP

Concerning the willingness to pay for environmental labelling:

- The average relative willingness to pay more was found at **8.9% of the product price (SD +/-6.5)**.
- The values increase over time ($R=0.32$; $p=0.052$) but time delivers only a weak explanation so that other factors should explain differences better.
- Survey techniques for example had a significant influence (ANOVA $p<0.05$). **Mail surveys produced higher values than telephone surveys and much higher values than personal interviews!**
- In relation to the different wood products we found the **lowest willingness to pay can be observed** in case of vague product descriptions (e.g. furniture or wood products) followed by **houses**. Dining sets, chairs and kitchens received the highest values.



Conclusions

The meta-analysis delivered several results of relevance:

The frequently measured willingness to pay is not suited to estimate possible price premiums (Anderson & Hansen, 2004).

An additional value may be delivered to the consumer which can be crucial in the decision making process. Therefore environmental certification and labelling could be a tool to increase wood products consumption if the label delivers a base for decision making (Teisl et al., 2002) e.g. by some kind of rating included in the labels.

In context with carbon storage and wood products two approaches for such ratings could be applied:

1. the amount of carbon stored in the product to distinguish wood from other materials
2. the carbon dioxide produced in the production process to distinguish between wood products.

What is the Potential?

In both cases between 33 and 56% of the customers can be expected to perceive additional value. These proportions seem most likely depending on the recent economic situation. A certain consumer segment can be defined (female, environmental concerned, educated, politically liberal).

Although it may be possible to target these consumers by certain marketing activities **socio-demographic factors have been proven bad predictors of behaviour** (Haley, 1968). More likely the product usage context is a key factor to assess values perceived by consumers (Warlop & Ratneshwar, 1993).

The greatest challenge uncovered is the **rather weak adequacy of houses as environmentally certified “products”** as the construction sector was found the most effective application field in terms of carbon storage.

This topic definitely **needs further considerations and research** e.g. by analysing the effects of subsidies and consumer information campaigns.

Thank You very much!