

# Biorefineries and the Austrian Pulp and Paper Industry

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**Efficient Biorefineries do already exist.**

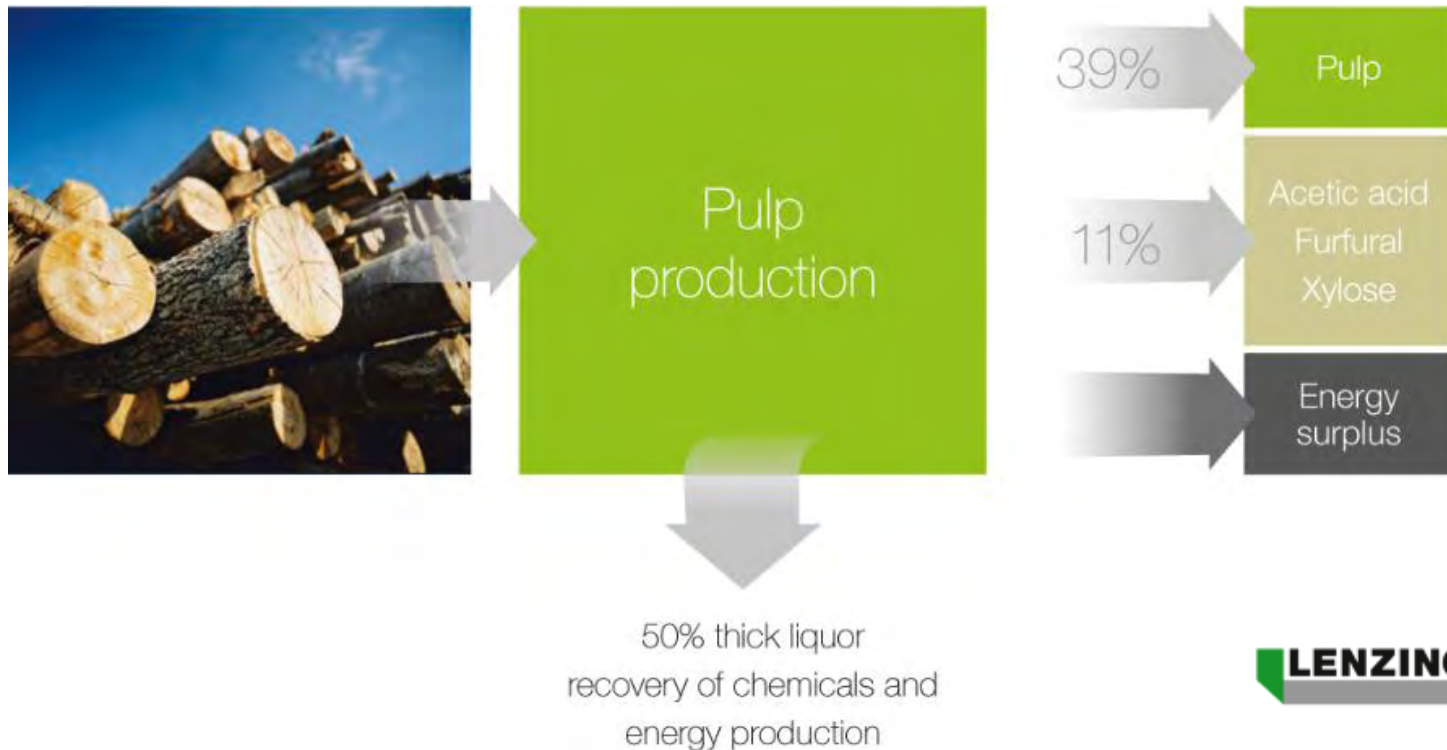
**Cascading use of wood is most efficient.**

**The existing subsidies for wood combustion are  
a real challenge for the bioeconomy.**

# Efficient biorefineries in the Austrian Pulp and Paper Industry

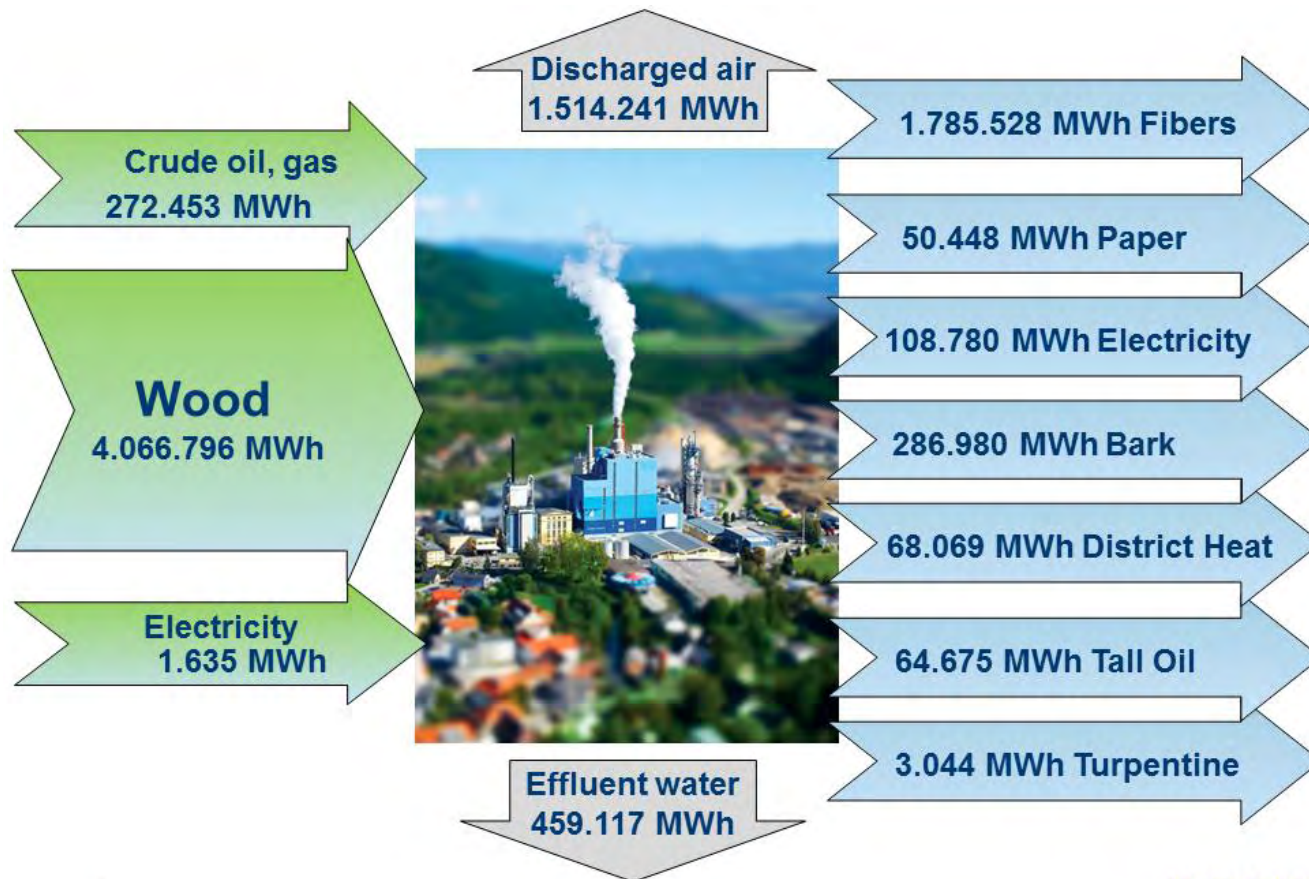
## Example 1: Lenzing AG

Highly efficient Cellulose production for textiles



# Efficient biorefineries in the Austrian Pulp and Paper Industry

## Example 2: Biorefinery Zellstoff Pöls



# Efficient biorefineries in the Austrian Pulp and Paper Industry

## Example 3: Mondi Frantschach



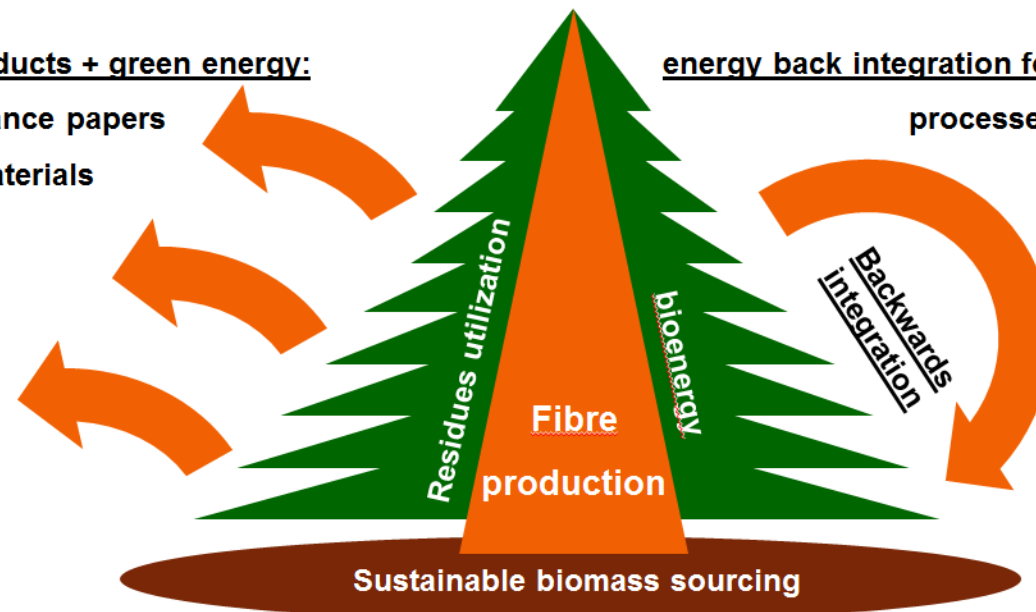
- The Mondi biorefinery is based on the aqueous sulphate pulping processes as the central backbone of a modern biorefinery:
  - Cascade usage of the resources, recycling of materials
  - Utilization of structures and synthesis products derived from nature
  - Energy efficient processing

### Biobased products + green energy:

High performance papers  
 Composite materials  
 Special pulps  
 Turpentine  
 District heat  
 Electricity

### energy back integration for:

processes



# Efficient biorefineries in the Austrian Pulp and Paper Industry

**Such Biorefineries do already exist!**

- Within these biorefineries, there are **lots of different valuable products manufactured from wood.**
- The **valuable resource wood** is **used** there **in the most efficient way** that is actually known.
- And the **companies are continuously working on improvements**, that enable higher value creation from wood.

There are for example several R&D-Projects:

- Production optimization (Energy, Enzymes,...)
- New Products from wood (FLIPPR,...)

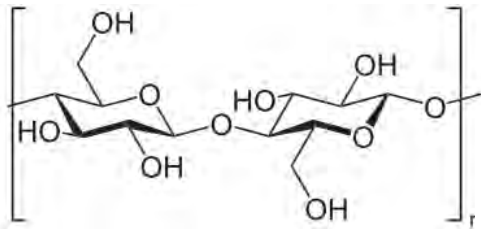
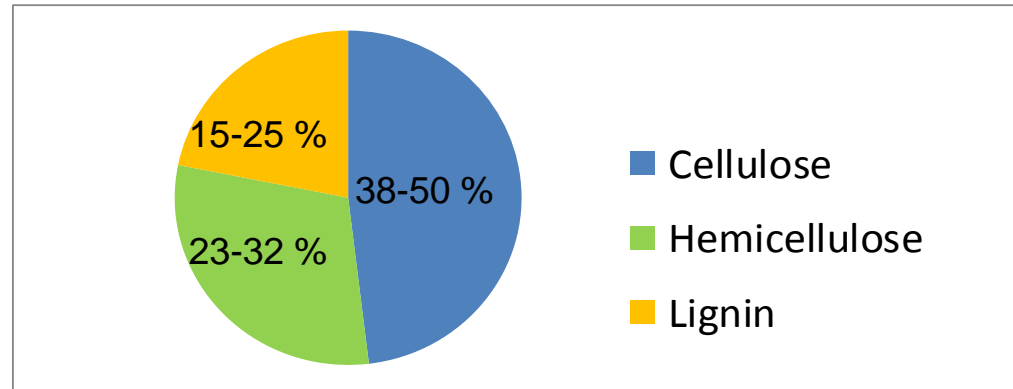
**The Austrian Pulp and Paper Industry is  
very experienced in biorefining!**

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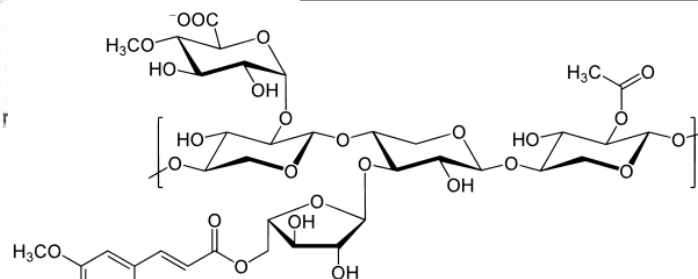
# Cascading use of wood is most efficient

**It enables highest value creation**

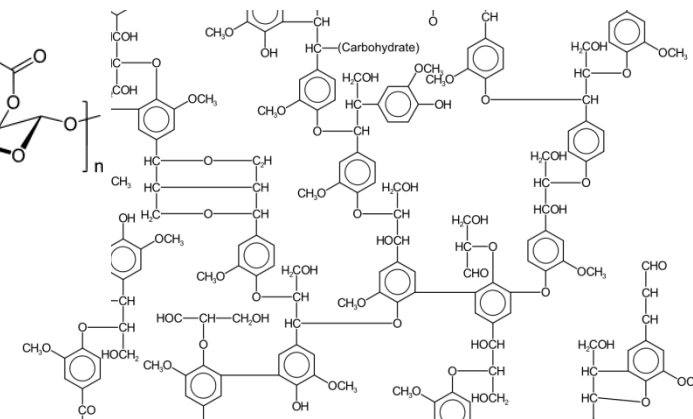
**What is wood?  
What does it consist of?**



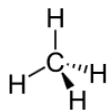
Cellulose: Caloric value: 17,5 MJ/kg



Hemicellulose: Caloric value: 16,5 MJ/kg



Lignin: Caloric value: 30 MJ/kg



Methane: Caloric value: 55,5 MJ/kg

# Cascading use of wood is most efficient

**It enables highest value creation**

## **What products can be produced from wood?**

- Textile fibers (clothing, medical care, hygiene products,...)
- Paper and Packaging Products
- Acetic Acid
- Furfural
- Xylose
- Composite Materials
- Special Pulps
- Turpentine
- Tall Oil → Special Chemicals
- Energy (Heat/Electricity) ← from Residuals and Lignin only

**These products are produced economically without any funding!**

# Cascading use of wood is most efficient

**It enables highest value creation**

## **Why do all these products generate higher value than direct generation of electricity?**

- Because all these products are of **high value** for our life, and they are **produced in parallel**.
- Because they are **recycled in large part**. (Paper fibers are used around 7 times).
- At the **end of their life cycle**, their **energy content can still be used** by burning them. It is stored within them, all over the time of use.

**Producing high value products from wood is the most efficient and ecological way of use!**

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# Cascading use of wood is most efficient

**It enables highest value creation**

**The advantage of cascading use can also be seen in economical practice.**

- **Large Biomass powerplants** – such as the powerplant in Vienna Simmering – **do NOT run economically** without funding!
- Even **with Investment subsidies and feed-in tariffs** the yearly **earnings** were **near to zero** for Simmering right from the start.
- And **at the end of the feed-in tariffs** (2019), there are **losses of several Million Euros** per year to be **expected**.

(Source: Inspection Report 2010 of the Monitoring Agency of Vienna)

**Direct wood combustion is not economical without subsidies!**

# Subsidies for electricity from wood combustion are an enormous challenge for the Austrian Bioeconomy

Subsidies by the Austrian Eco Electricity Law [Mio. €]

Energieträger	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
	Marktpreis	Marktpreis	Marktpreis	Marktpreis	Marktpreis	Marktpreis	Marktpreis	Marktpreis	Marktpreis	Marktpreis	Marktpreis
	Cent/kWh	Cent/kWh	Cent/kWh	Cent/kWh	Cent/kWh	Cent/kWh	Cent/kWh	Cent/kWh	Cent/kWh	Cent/kWh	Cent/kWh
Windkraft	24	50	75	71	74	42	49	78	56	83	154
Biomasse fest	16	26	43	87	156	142	160	184	171	179	196
Biogas	17	18	25	32	51	61	60	63	58	68	65
Biomasse flüssig	1	2	3	5	10	4	3	3	1	0	1
Photovoltaik	8	8	8	8	8	9	11	13	17	32	67
Anderer unterstützter Ökostrom	3	3	2	1	3	1	1	2	1	0	1
Summe „Sonstiger“ Ökostrom	70	108	155	205	303	259	284	343	304	362	485
Kleinwasserkraft (OeMAG)	69	77	67	-7	12	-7	-4	7	4	1	16
Summe unterstützter Ökostrom	139	184	223	198	315	252	280	350	308	363	501

Source: E-Control, OeMAG/Öko-BGW's

**Highest amount of subsidies goes to solid biomass combustion.**

# Subsidies for electricity from wood combustion are an enormous challenge for the Austrian Bioeconomy

## These subsidies lead to:

- **Rising energy prices** for everyone
- **Rising demand** for wood
- **Rising prices** for wood
- **Need for imported** wood
- **Rising Carbon footprint** due to transportation = **less ecological** production
- **Disadvantages for Austrian sites** of international companies. → Reduced investments in R&D = **less progress** in biorefining.

Most efficient development of highest value creation would automatically take place on a free market.

**Subsidies for direct wood combustion are a waste of public money!**

# The most important statements of this presentation

- **Highly efficient biorefineries** with lots of experience **do already exist.**
- **Cascading use of wood is more efficient** than direct incineration.
- **Subsidies for** combustion of wood **create real challenges for the existing bioeconomy, and are therefore inecological.** Instead of distorting the market, the production of wood might be subvented.
- **To create the range of products with highest value, a free market** – with no preference for any kind of use and also not for any site - **is needed.**

**Thank you very much for your Attention!**