mantex

# Using X-ray technology for real-time feedstock analysis and Process Optimization

## Mantex Biomass Analyzer

Gustav Melin, CEO Mantex



# The importance of moisture management!

## What 1 percentage point of moisture is worth at €35/MWh (11 USD/GJ)

The value changes by approx. **€2.1 per tonne and percentage point** of moisture across the whole 35–65% range. For a plant equivalent to 480 GWh, 1 percentage point of moisture is worth **€0.3–0.7 million per year**. Paying for the energy content teaches suppliers to deliver drier raw material, which cuts drying costs.

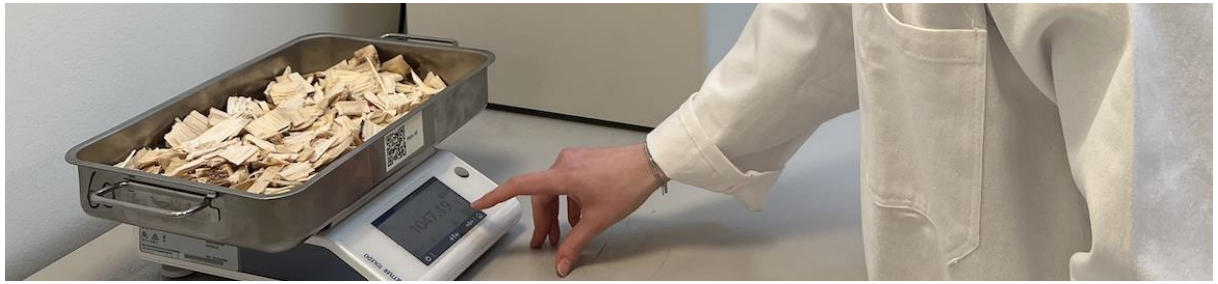
| Moisture content | Energy (MWh/t) | Value (€/t) | Tonnes raw material per year for 480 GWh | Value of 1 pp moisture per year | Share of raw material value |
|---|---|---|---|---|---|
| **35%** | 3.19 | 112 | 150,600 | **€0.31M** | 1.9% |
| **40%** | 2.89 | 101 | 166,000 | **€0.35M** | 2.1% |
| **45%** | 2.59 | 91 | 185,100 | **€0.39M** | 2.3% |
| **50%** | 2.30 | 80 | 209,100 | **€0.44M** | 2.6% |
| **55%** | 2.00 | 70 | 240,200 | **€0.50M** | 3.0% |
| **60%** | 1.70 | 60 | 282,200 | **€0.59M** | 3.5% |
| **65%** | 1.40 | 49 | 342,000 | **€0.71M** | 4.2% |

Energy price €35/MWh. Net calorific value of dry wood approx. 19.0 MJ/kg. Raw material energy set equal to 480 GWh of pellets (100,000 tonnes).

# Current methods: oven and laboratory

## Dry matter analysis: 1–2 days



## Ash analysis: 1–2 weeks





# Mantex AB

- Swedish technology company based in Kista, Stockholm
- Specialist expertise in X-ray technology
- Develops X-ray analysers for pulp and biomass
- 7 patents
- 8 employees
- Listed on Nasdaq First North Growth Market, Stockholm



# Mantex BMA: A new way of working

**Moisture 2–5 minutes, ash analysis 5–10 minutes**

- Fill the sample box with chips or sawdust
- Place the box in the Mantex Biomass Analyzer
- Get moisture or ash results within minutes
- Automatic data transfer to measurement and weighbridge systems (e.g. Viol 3 and VIKTORIA in Sweden)
- Operated by the truck driver after brief training










# Current Mantex customers in the pulp and pellet industry








## Waggeryd Cell, Vaggeryd

## Analysis of pulpwood chips

- Unmanned intake control 24/7
- The truck driver runs the sample in the Mantex BMA
- Annual tonnage of bleached chemi-thermomechanical pulp, BCTMP, increased from 60,000 to 200,000 in ten years through continuous efficiency improvements

## Arctic Paper, Grycksbo

## Analysis of sawdust for pellets

- The driver takes the sample
- Mantex BMA is part of the unloading process
- New pellet plant – expected to save SEK 50 million per year in energy costs
- Pellet and powder production approx. 90,000 tonnes

## Rottneros Bruk

- Mantex equipment at intake handled by Biometria
- CTMP (chemi-thermomechanical pulp) production
- Capacity of 165,000 tonnes per year

# Example: pellet plant producing 100,000 tonnes

Pellets at 8% moisture (480 GWh). Purchased raw sawdust at 52% moisture. The dryer is fired with the plant's own sawdust. Energy price €35/MWh.

| | |
|---|---|
| Dry matter in the pellets | 92,000 t |
| Sawdust for the pellets (52%) | 191,700 t |
| Water to evaporate | 91,700 t |
| Sawdust as dryer fuel | 42,100 t |
| **Total sawdust purchased per year** | **233,800 t** |
| Value of sawdust at 52% moisture | €76 /t |
| **Raw material cost per year** | **€17.8M** |

1 percentage point of moisture is worth

**€0.49M**

**per year**

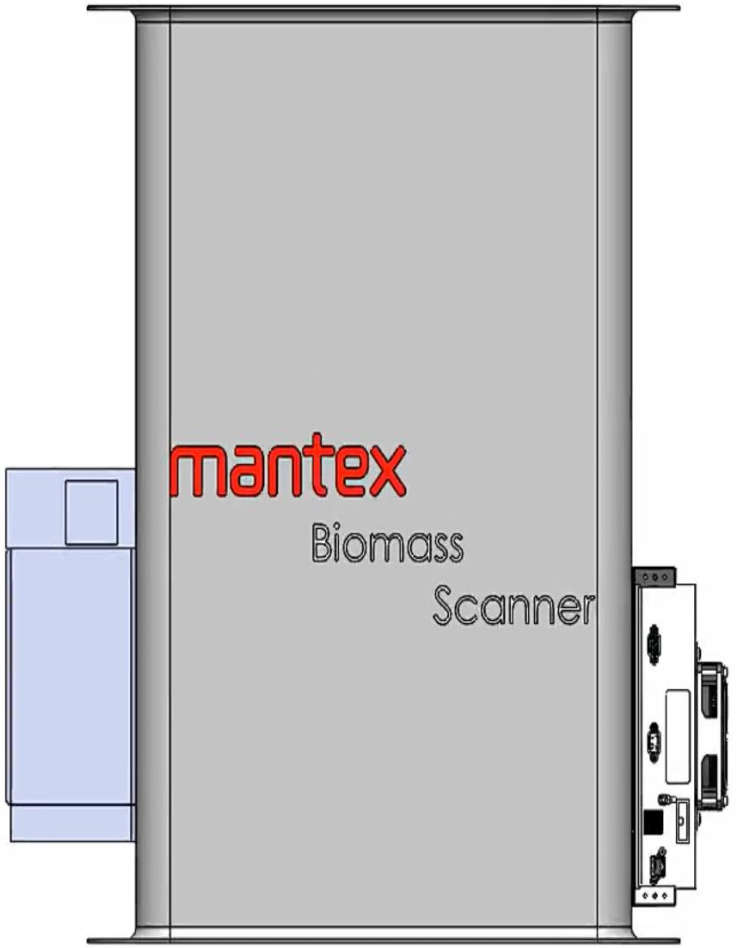
233,800 t × €2.08 per tonne and percentage point

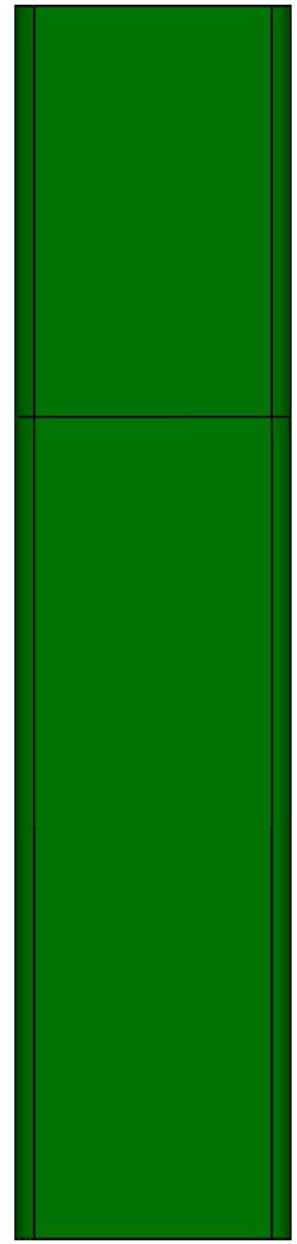
Assumes 1.0 MWh fuel per tonne of water evaporated. Net calorific value of dry wood approx. 19.0 MJ/kg.

Development project, installation at factory in November.

# Pellet production process optimization

- Development project together with the pellet producer Scandbio, at the Norberg plant.
- Will measure moisture after the dryer and before the pellet presses.
- The goal is to get a stable, reliable moisture reading to optimise the drying of sawdust and the blending in of shavings.
- **Avoiding over-drying pays back in four areas:**
  - Lower drying costs
  - Higher production rate
  - Lower maintenance costs
  - More tonnes to sell





# Thanks for listening!

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