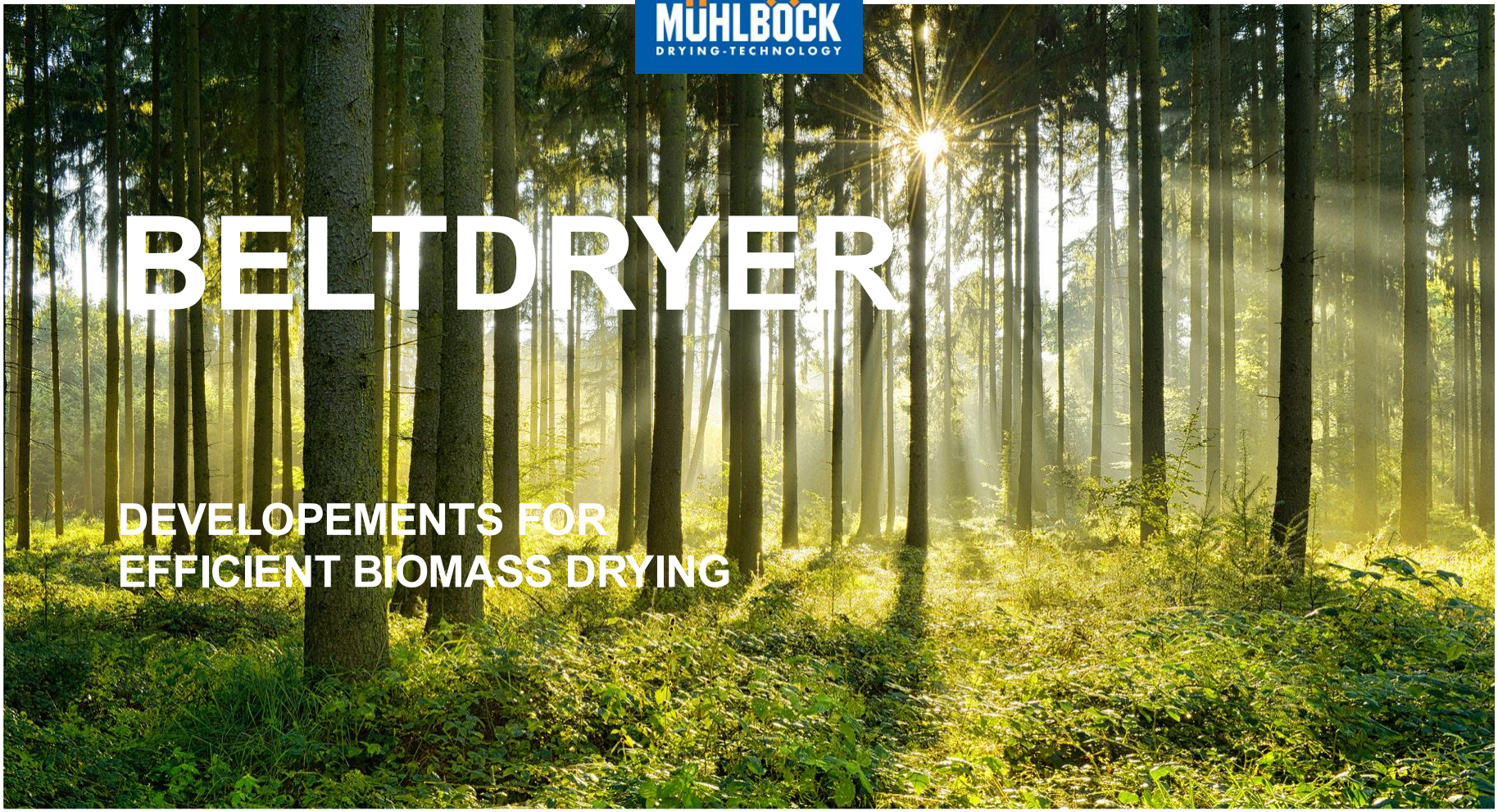
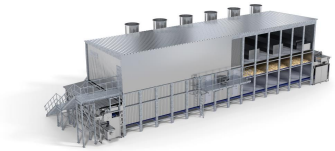

MÜHLBOCK
DRYING-TECHNOLOGY
BELTDRYER
DEVELOPEMENTS FOR
EFFICIENT BIOMASS DRYING

Belt dryer

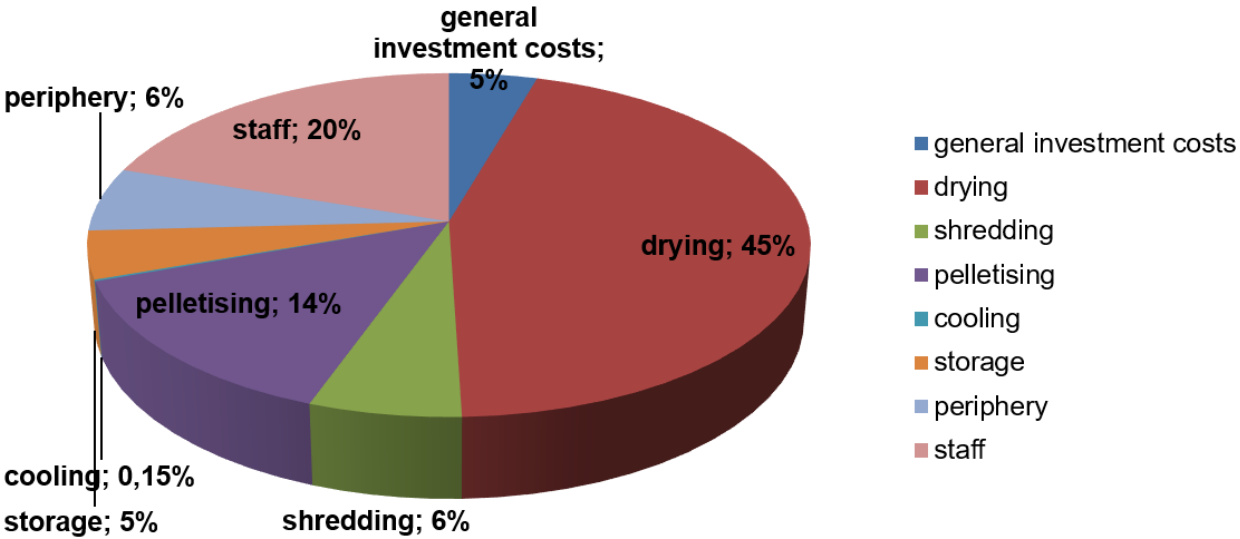


BELT DRYER
CLASSIC

BELT DRYER
1003 PREMIUM

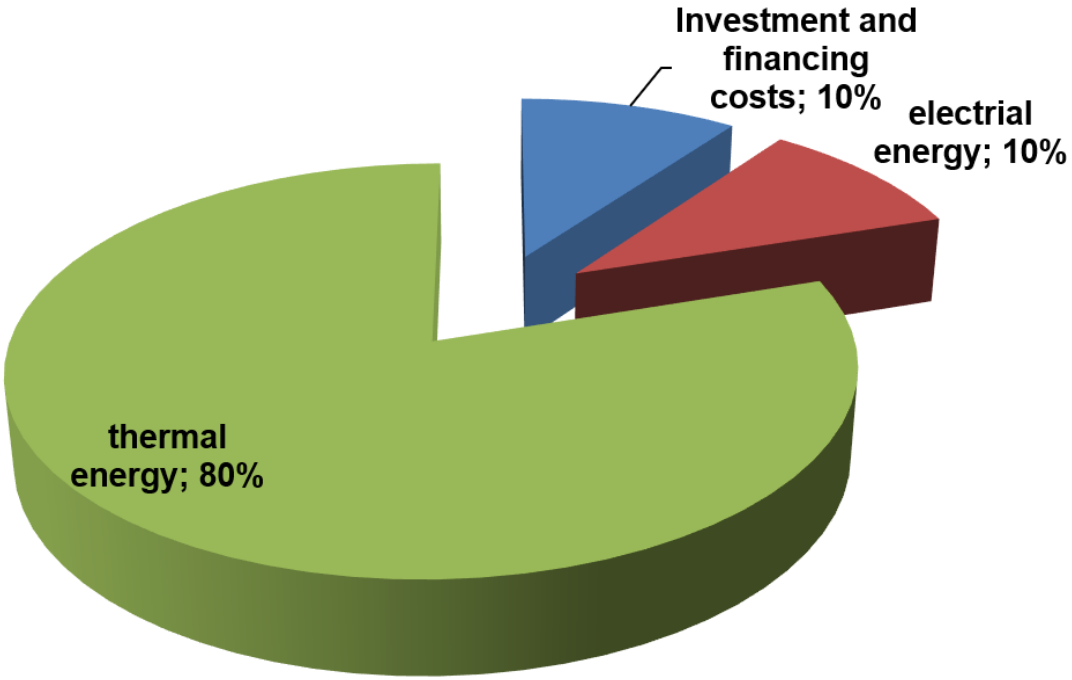
ENERGY EFFICIENCY

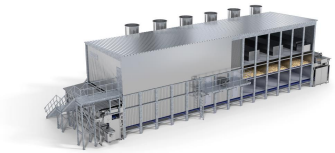
Cost structure pellet production WITHOUT raw material (average value)



Source: production costs of wood pellets.
TU Graz/BIOS bio energy systems

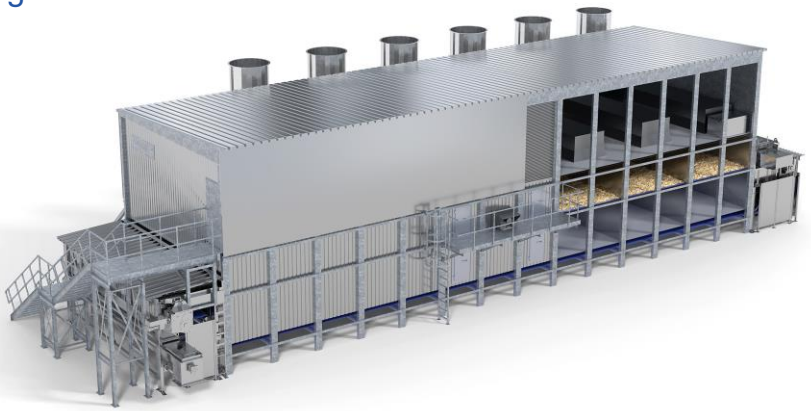
DRYING COSTS – average value

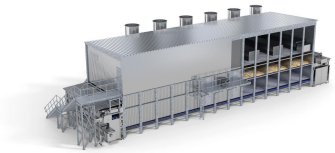




BELT DRYER
CLASSIC
BTCL/BTLA

- Modular design 20 / 40 m² - easy to upgrade
- Each module with its own heating coil and fan
- High-end components
- Dryer sizes 40 - 320m²

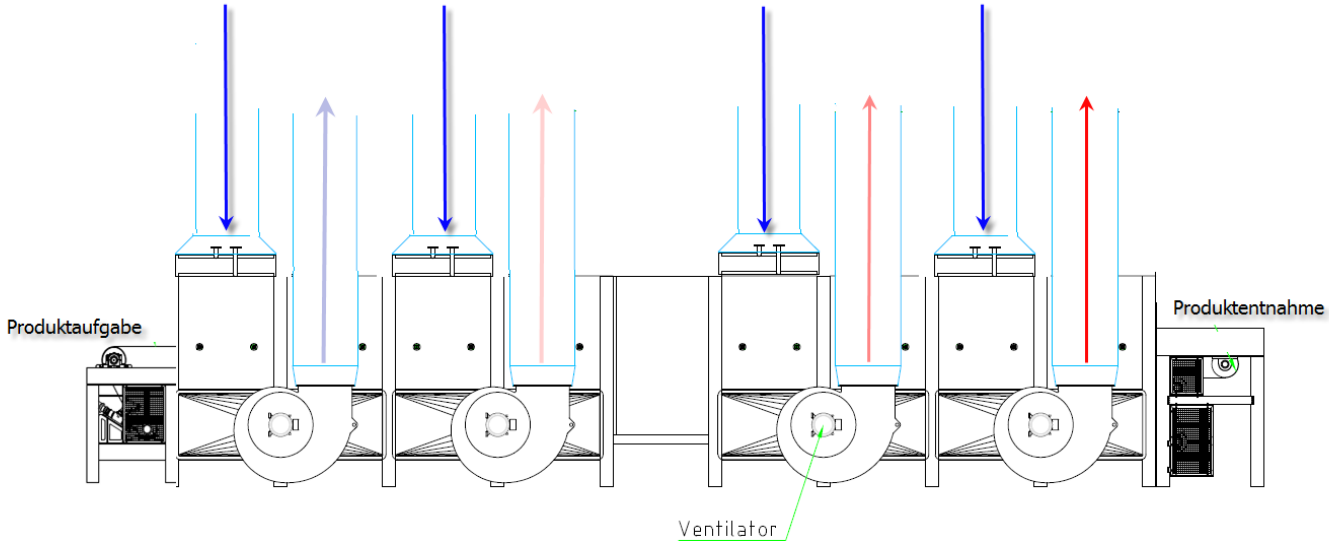


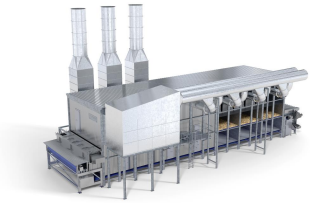


BELT DRYER

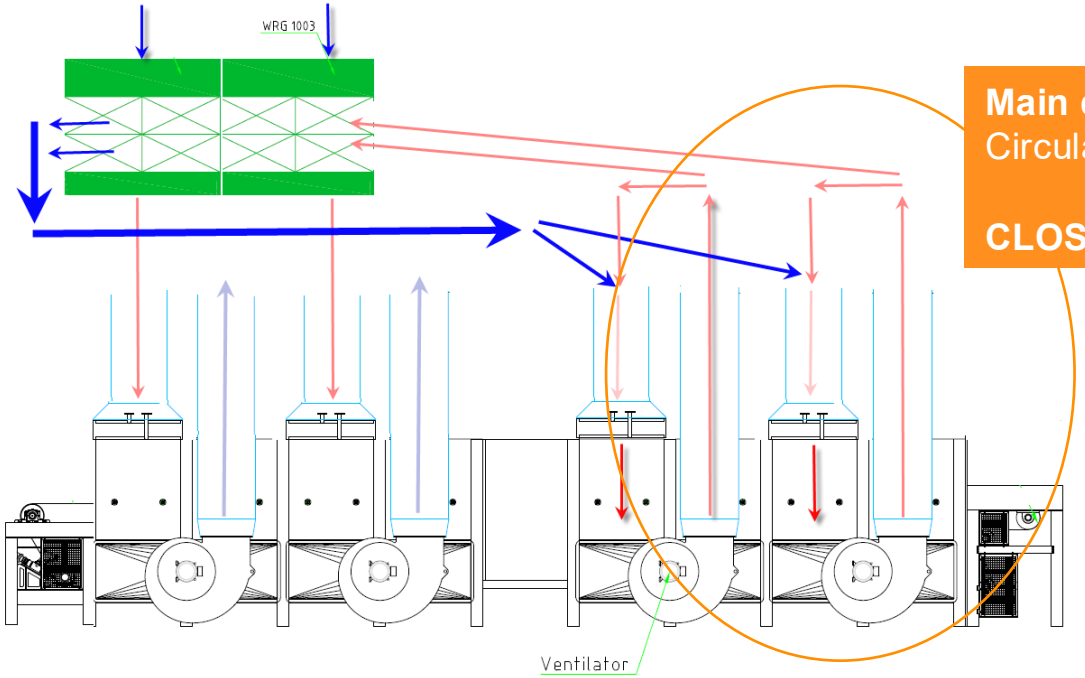
CLASSIC

All the drying air is drawn in as fresh air. This air is heated via heat exchangers and blown out again via the exhaust air after drying → THROUGH-AIR PRINCIPLE



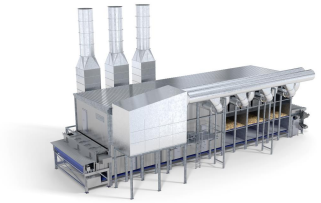


BELT DRYER
1003 PREMIUM

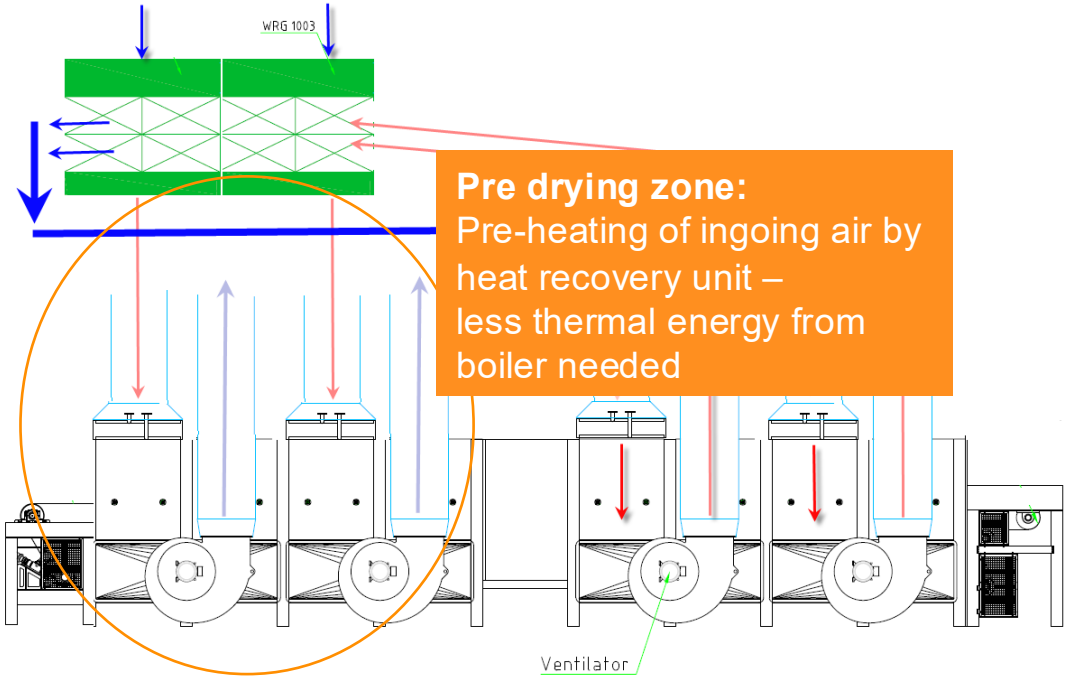


Main drying zone:
Circulating prinziple

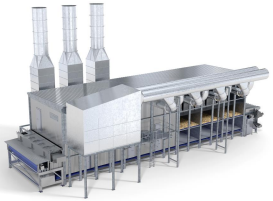
CLOSED AIR SYSTEM



BELT DRYER
1003 PREMIUM

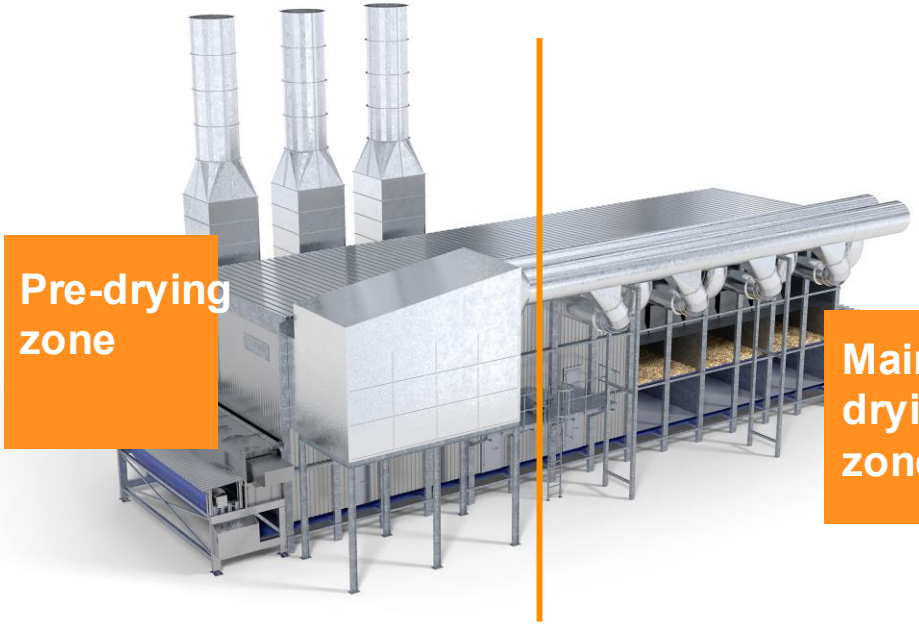


Pre drying zone:
Pre-heating of ingoing air by heat recovery unit –
less thermal energy from boiler needed



BELT DRYER

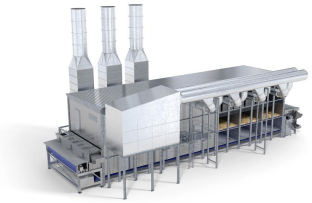
1003 PREMIUM



Pre-drying zone

Main drying zone

50% ENERGY SAVING



BELT DRYER

1003 PREMIUM

The advantages

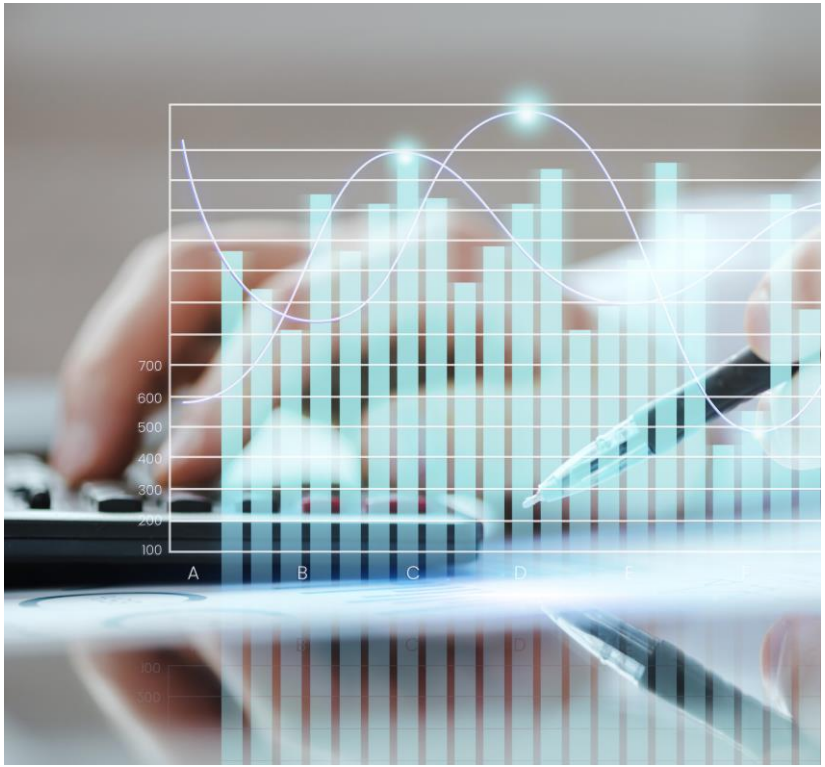
- Reduction of thermal energy consumption

OR

- Increase in output with constant heat supply

- Equalization of seasonal fluctuations in thermal energy consumption energy consumption due to higher efficiency of heat recovery in winter
- Fuel savings
- Reduction of dust emissions to below 5 mg/Nm³
- Savings in investment costs and operation of the pipe network for heat supply

BELT DRYER DEVELOPMENT



Further development of control system

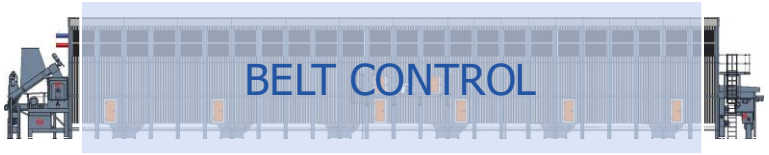
- Model-based multi-zone control
- Optimizer - intelligent drying

MODEL-BASED MULTI-ZONE CONTROL

HOW ARE BELT DRYER CURRENTLY CONTROLLED?

- BELT SPEED

Material too dry → Faster belt speed
Material too wet → Belt speed slower



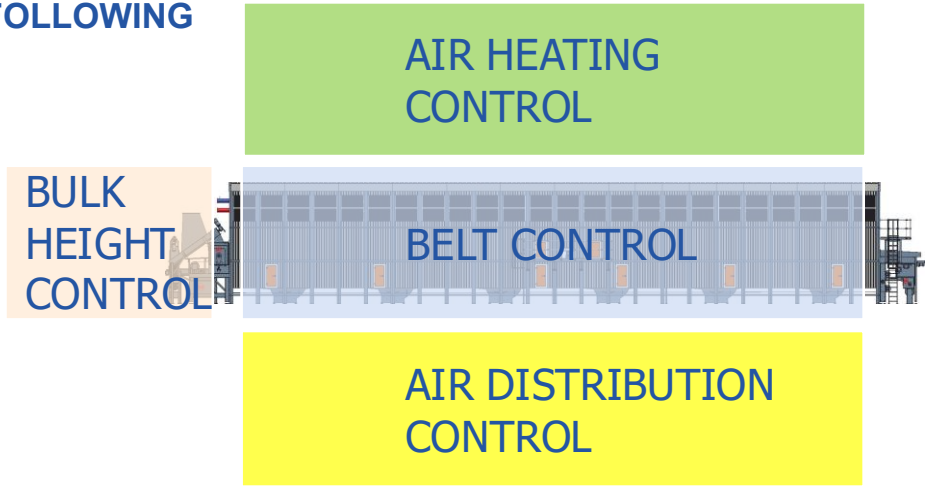
DISADVANTAGES:

- No constant throughput
- Influence on material moisture in all zones
- Reaction to deviation from the target state ("too wet, too dry")

MODEL-BASED MULTI-ZONE CONTROL

MODEL-BASED CONTROL CONSISTS OF THE FOLLOWING FUNCTION BLOCKS

- BELT SPEED CONTROL
- BULK HEIGHT CONTROL
- AIR HEATING CONTROL
- AIR DISTRIBUTION CONTROL



MODEL-BASED MULTI-ZONE CONTROL

AIR DISTRIBUTION CONTROL

- Uses the speed of the fans to minimize the fluctuation range of the outlet humidity
- Enables "FIXED PRODUCTION VOLUME" operation with constant belt speed

OPTIMIZER & INTELLIGENT CONTROL

DIFFERENT CUSTOMER REQUIREMENTS

- DRYING STRATEGIES
  - MAXIMUM capacity volume
  - FIXED capacity volume
  - CONSTANT fan speed (→ constant heat consumption)
  - …..
- INFLUENCING FACTORS MARKET / ENERGY SUPPLY / COMPANY
  - Variable electricity prices
  - Availability of thermal energy
  - Storage levels in silos
  - Production processes (shift operation)
  - ……..…..

OPTIMIZER & INTELLIGENT CONTROL

MAIN GOAL

- OPTIMIZATION OF PRODUCTION CAPACITY
- COST OPTIMIZATION
  (= "ECONOMIC EFFICIENCY CALCULATOR"
  INSIDE CONTROL SYSTEM)

OPTIMIZER & INTELLIGENT CONTROL

AI for belt dryer control
(self-learning and self-optimizing control taking into account the customer's optimization criteria)

DRY
THE
NEXT
LEVEL.