



# ANDRITZ SOLUTIONS TO PRODUCE ADVANCED SOLID BIOFUELS

WORLD BIOENERGY ASSOCIATION WEBINAR  
JUNE 25TH, 2026

MAXIMILIAN LEHR

**ANDRITZ**

# ANDRITZ: WORLD MARKET LEADER WITH FOUR BUSINESS AREAS



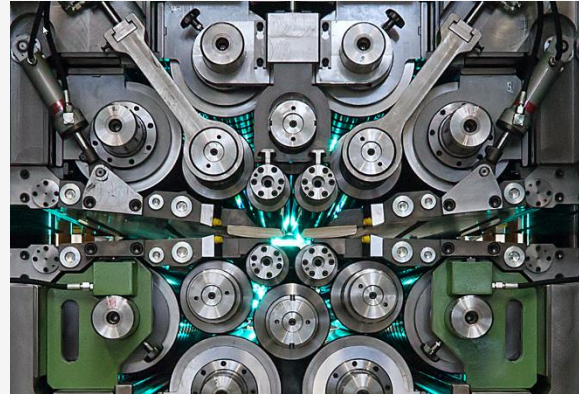
## PULP & PAPER



38%\*

Pulp: #1  
Paper: #3

## METALS



21%\*

Forming: #1  
Processing: #1-2

## HYDROPOWER



22%\*

#1-2

## ENVIRONMENT & ENERGY



19%\*

#1-3

\* Share of total group revenue 2025

# Global market position, estimated by ANDRITZ

# ANDRITZ: CLOSE TO OUR CUSTOMERS



# SPEAKER INTRODUCTION



## Maximilian LEHR

Technology Manager – ANDRITZ Fiber & Recycling

- From Vienna, Austria
- BSc and MSc Chemical Engineering, Vienna University of Technology
- PhD Chemical Engineering, Vienna University of Technology / MM Board & Paper
- Steam-Ex, Biomass Washing & Leaching, Fiberboard, Biorefinery
- Technology, R&D, Sales, Business Development
- Passionate Volunteer Firefighter in Austria

✉ [maximilian.lehr@andritz.com](mailto:maximilian.lehr@andritz.com)

☎ +43 676 3053321





# ANDRITZ ADVANCED SOLID BIOFUEL TECHNOLOGIES

# ADVANCED SOLID BIOFUEL COMPARISON



## Torrefaction

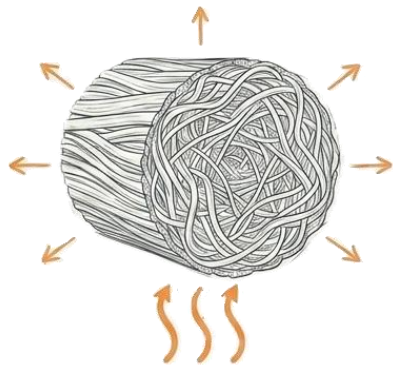
= thermochemical dry process



vs.

## Steam Explosion

= mechanical-physical-thermochemical wet process



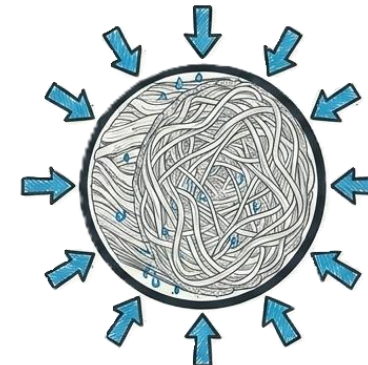
**Heating in oxygen-free atmosphere to around 250 – 330 °C**

- Hemicelluloses and part of the lignin decompose
- Torrgas is released



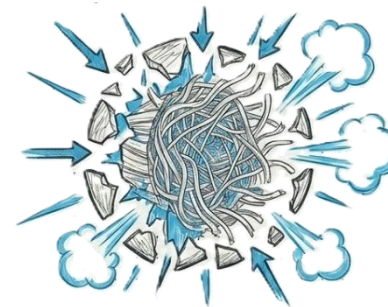
**Transformation into dark brittle material**

- Torrefied material with improved fuel characteristics (e.g. high calorific value and fixed carbon content)



**Heating with steam in a pressurized atmosphere to around 200 – 215 °C**

- Steam penetrates the biomass
- Partial conversion of the hemicelluloses into different degradation products like acetic acid and furfural
- Lignin is softened and partly melts



**Flashing of the water by quick pressure drop**

- Bursting of the biomass = steam explosion
- Fine material with large surface and excellent pelleting properties

# (ADVANCED) SOLID BIOFUELS COMPARISON



**Steam Explosion Pellets:** Drop-in fuel for coal-fired heat and power plants, especially because of high grindability and water resistance

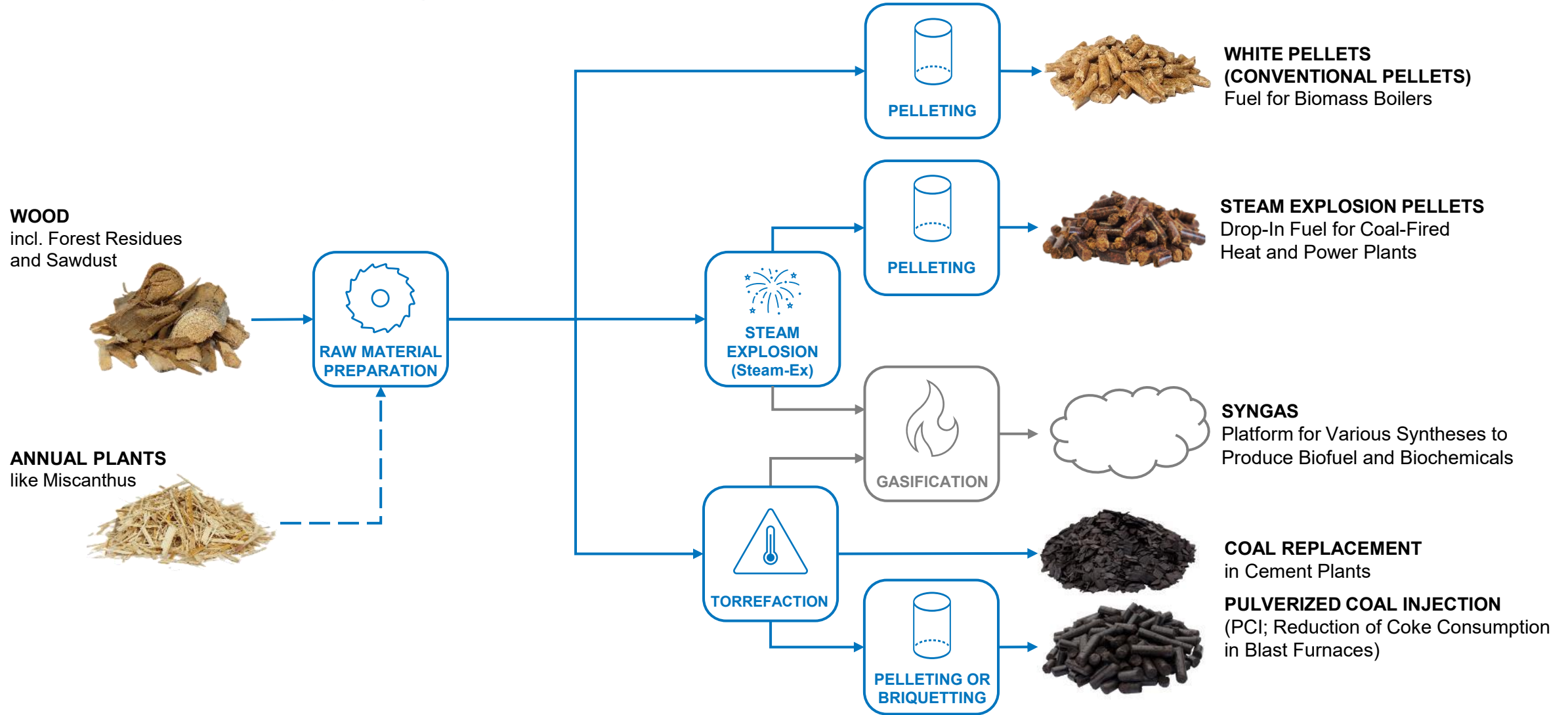
**Torrefied Pellets:** Steel and cement industry where higher fixed carbon content is important

Typical Properties at 6 % Moisture Content	Conventional Pellets	Steam Explosion Pellets	Torrefied Pellets
Net Calorific Value in GJ/t	17.5	19	21
Fixed Carbon Content in wt% (db)	15	20	35
Pellet Bulk Density in kg/m <sup>3</sup>	650	730	680
Volumetric Energy Density in GJ/m <sup>3</sup>	11.6	13.9	14.3
Mass Yield of Thermal Treatment	100 %	90 %	65 %
Pelleting Power consumption	-	lower*	higher*
Need for a Pellet-Binder	yes	no	yes
Durability	-	higher*	-
Water Resistance	-	much higher*	higher*
Grindability	-	higher*	much higher*

\*compared to conventional pellets



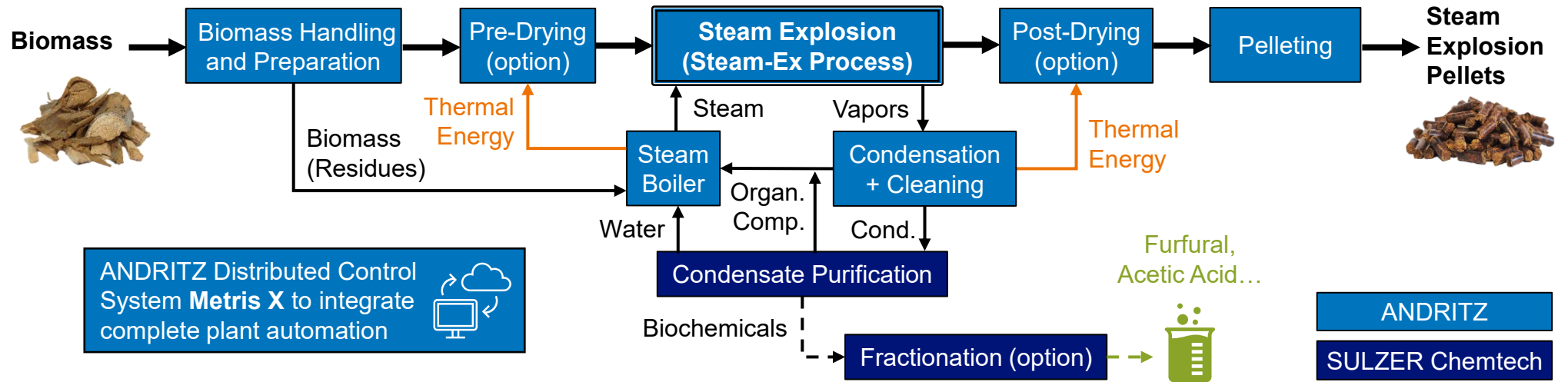
# ANDRITZ (ADVANCED) SOLID BIOFUEL TECHNOLOGIES



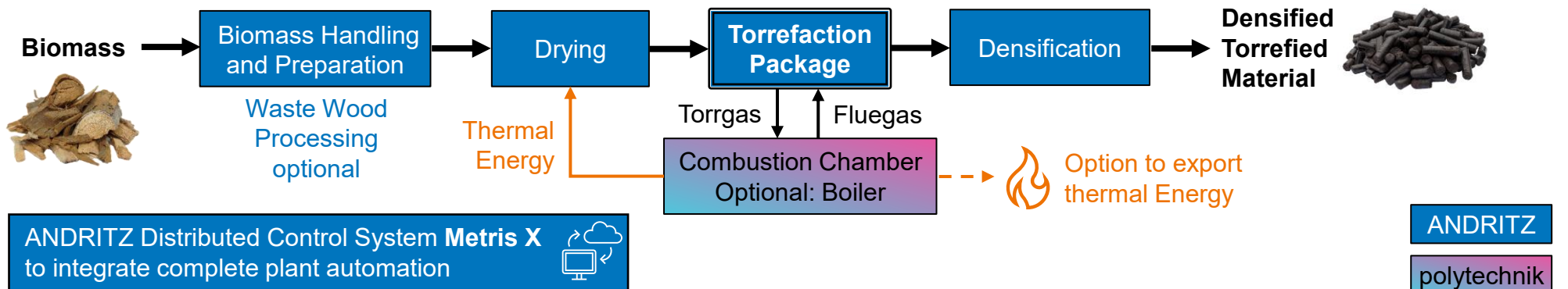
# ANDRITZ ADVANCED SOLID BIOFUEL TECHNOLOGIES



## Steam-Ex Pellet Line 150 ktpy (db)



## Torrefaction Line 60 ktpy (db)



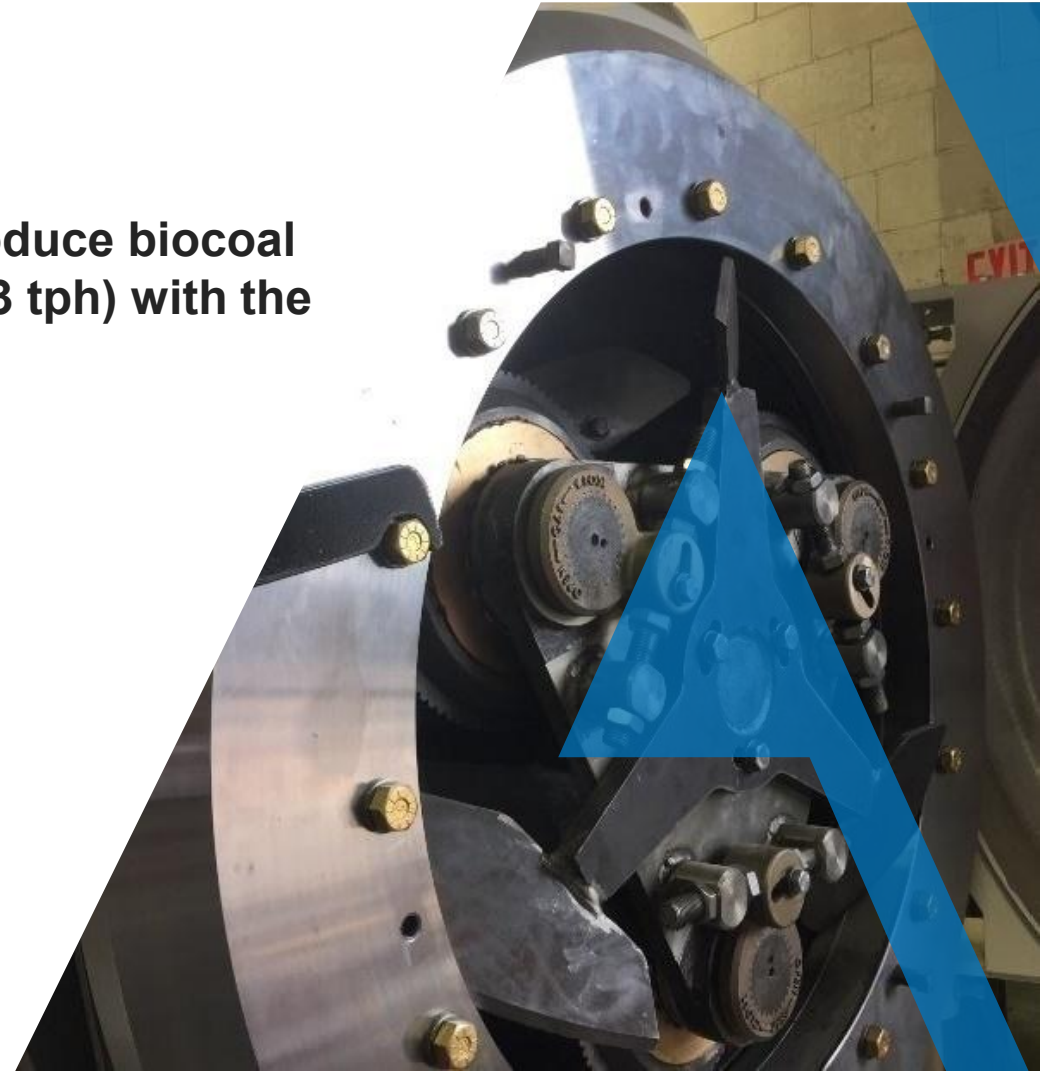
# ANDRITZ PELLETT MILLS



Sprout 26LM 3



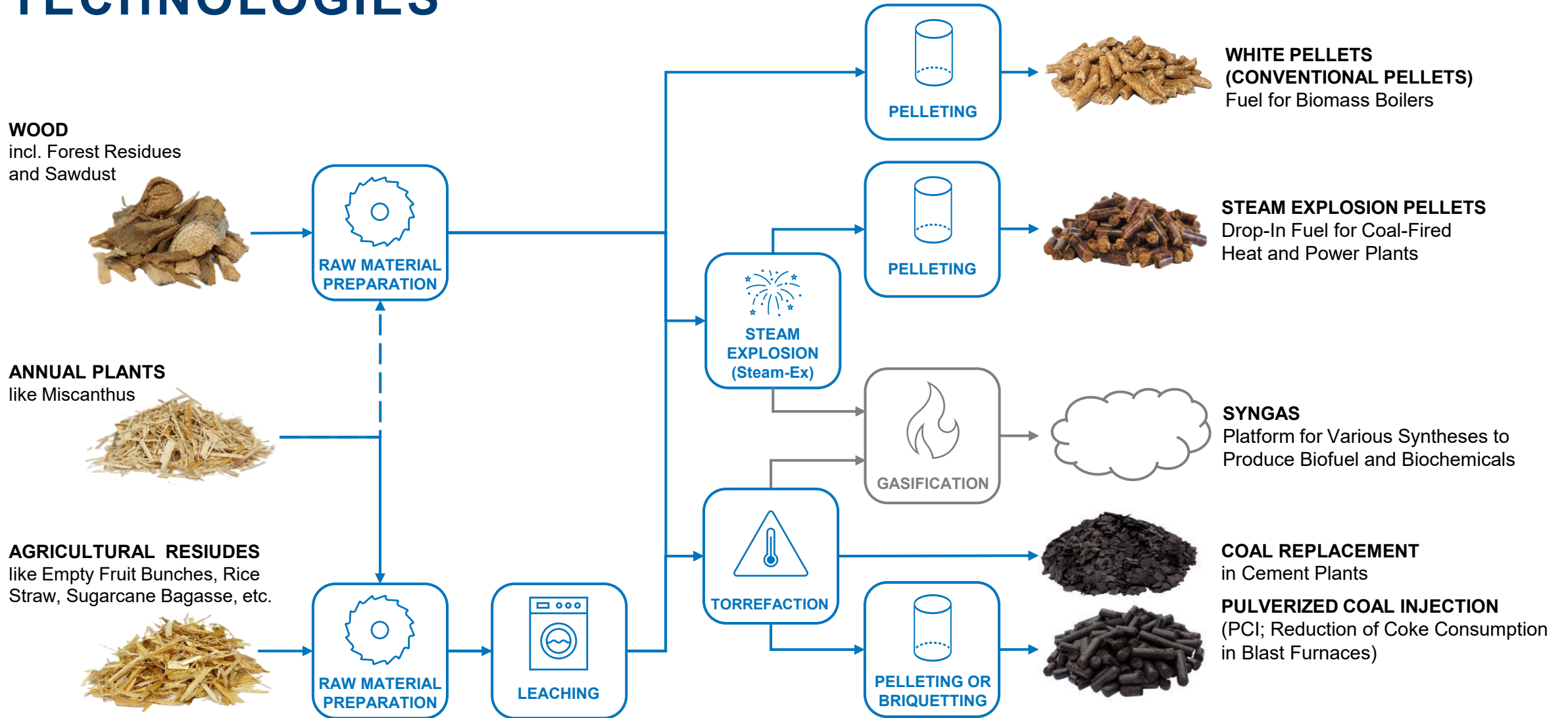
**“Airex has been using an ANDRITZ pellet mill since 2016 to produce biocoal pellets at a rate of 2 tph. We can achieve more capacity (2.5 to 3 tph) with the pellet mill, but we keep it in sync with the torrefaction unit.”**





# ANDRITZ BIOMASS LEACHING PROCESS

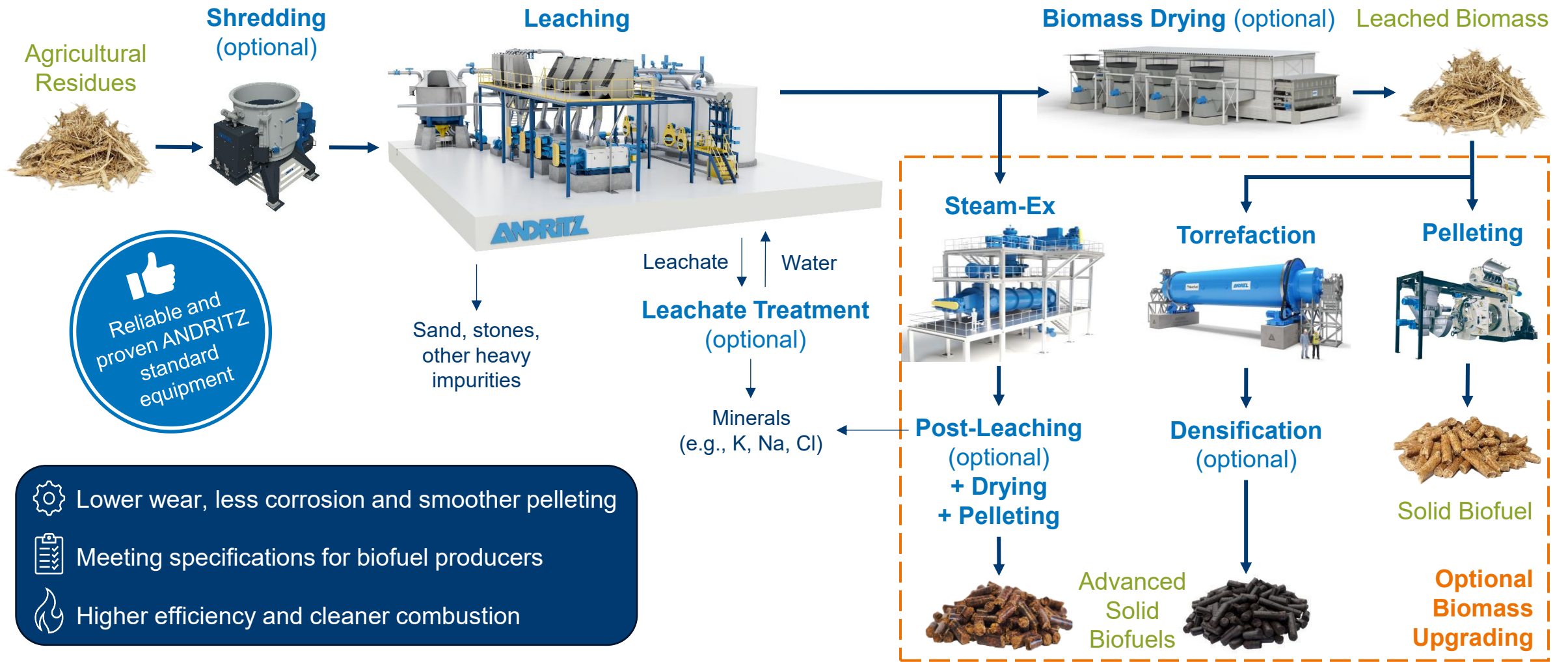
# (ADVANCED) SOLID BIOFUEL TECHNOLOGIES



# ANDRITZ LEACHING TECHNOLOGY



ANDRITZ full-line supplier for *Agri-Residues-to-(Advanced)-Solid-Biofuel* Lines

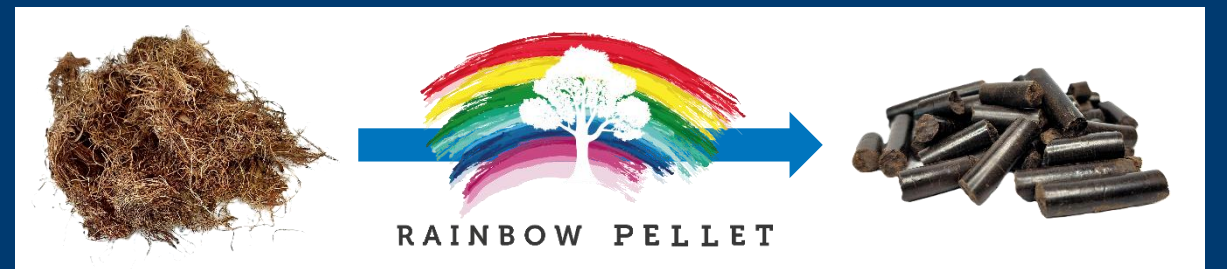


- Lower wear, less corrosion and smoother pelleting
- Meeting specifications for biofuel producers
- Higher efficiency and cleaner combustion

# SHOWCASE IN MALAYSIA: WORLD'S FIRST COMMERCIAL-SCALE EMPTY FRUIT BUNCH Steam-Ex PELLET PLANT



System: Leaching + Steam-Ex with horizontal reactor  
Feedstock: Empty fruit bunches, wood  
Capacity: 20 000 t/a  
Product: Steam explosion pellets  
Start-up: 2026



# Q&A

## *ANDRITZ SOLUTIONS TO PRODUCE ADVANCED SOLID BIOFUELS*

Maximilian LEHR

✉ [maximilian.lehr@andritz.com](mailto:maximilian.lehr@andritz.com)

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**ANDRITZ.  
FOR GROWTH  
THAT MATTERS.**

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