Waste-to-value
Innovative recycling of mill waste
Are you wasting your waste?
How to make profit from mill waste

Innovative technologies for sludge and reject handling, material separation and recovery, and production of renewable energy help you reduce dependency on purchased power or fossil fuels and eliminate landfilling of waste – thus improving your mill’s profitability.

Benefits
- No wasting of waste
- Producing substitute fuels and valuable by-products
- Improving profitability by closing the material and energy loops
- Important contribution to environmental protection and energy saving

High waste costs?
Mill sludge and other types of waste are costly to handle and transport and difficult to dispose of. This is particularly true in the processing of recycled fiber material, containing plastics, metals, and other contaminants. Other waste components are the sludge from deinking and water treatment, as well as wood residuals from the pulp mill.

Trash to treasure
Waste-to-value processes enhance your mill’s profitability by recycling the mill waste products. Such processes are the source of renewable energy (gas and oil) and valuable by-products, such as aluminum and bio-char. Modular system designs with scalable sizes can be adapted to the waste streams.

Creating fuels
ANDRITZ supplies innovative technologies, processes and equipment for the conversion of waste into valuable fuels. These systems include equipment for sludge and reject handling, drying, pelleting, pyrolysis, and combustion – contributing towards recovering resources and closing the recycling loop.

Creating value through recycling
Turning mill waste into fuels and products

<table>
<thead>
<tr>
<th>Pelleting systems</th>
<th>Pyrolysis systems</th>
<th>Combustion systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>Preferable for small volumes or when product is transported or stored for long periods of time</td>
<td>Preferable for high reject content in the feed stock</td>
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<tr>
<td>Fuel heating value</td>
<td>Flexible: low/high heating value fuels</td>
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<tr>
<td>Sludge volume</td>
<td>Handles large volumes of sludge (DIP or bio-sludge)</td>
<td>Handles variable volumes of sludge mixed with rejects</td>
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<tr>
<td>Energy efficiency</td>
<td>Adjustable and high heat value thanks to drying with recovered energy</td>
<td>Entire system is energy self-sufficient; surplus of heat and energy available</td>
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<tr>
<td>Ash</td>
<td>High ash content allowed</td>
<td>Ash can be converted into valuable products</td>
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<tr>
<td>Product</td>
<td>Odorless, stable, solid pellets</td>
<td>Aluminum and other metals, char, gas oil</td>
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<tr>
<td>Capacity range</td>
<td>Single-line pelleting press: 30-100 t/d</td>
<td>Single-line pyrolysis: 500-1,500 kg/h</td>
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</tbody>
</table>

Solid fraction
- Aluminum
- Silicate
- Char
- Gas
- Oil

Heat
- Power

Metals (ferrous and non-ferrous)
- Fibers

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Closing the material and energy loops
ANDRITZ systems and equipment

Sludge and reject handling
ANDRITZ has engineered solutions for new and existing recycled fiber lines and waste handling applications:
- Shredding
- Compacting
- Ferrous or non-ferrous metal separation
- Separation of unwanted or harmful contaminants
- Sludge dewatering

Drying and pelleting
ANDRITZ provides a range of drying technologies suited for all types of biomass and wastes. Rotary drums, belt dryers, compact multi-bed units, etc. are particularly suited for low-grade waste sources.
ANDRITZ pellet mills and auxiliary equipment are acknowledged globally as reliable and proven pelleting systems.

Pyrolysis and combustion
ANDRITZ offers innovative pyrolysis technology for full recycling of plastic rejects and laminates (plastic-aluminum compounds).
ANDRITZ power boiler technology – well suited for biomass and alternative fuels – has high combustion efficiency, and the equipment is designed for high availability and a long service life.