Using Biomass as Boiler Fuel

Replacing coal with ground/chipped wood and paper pellets in a solid fuel boiler to produce steam
Appleton Coated

• Located in Combined Locks, Wisconsin
• Products include coated papers for traditional and digital printing, specialty products, publishing papers.
• Some products are manufactured with Green (renewable) electric, recycled fiber and/or FSC certified pulp
Company Goal to reduce the use of fossil fuels

- Customers will value reducing our environmental impact
- Fossil fuels include coal, natural gas and fuel oil
- Non fossil fuels include wood and paper pellets
- Fuel used in boilers to produce steam
- Wood and paper pellets displace coal
Displacing coal

- One solid fuel boiler burns coal/paper pellets/wood
- Increasing wood and paper pellets will reduce the amount of coal used to produce steam
Increased use of wood and pellets

Non fossil boiler fuels

- tons/yr of paper pellets
- Tons/yr of wood


Tons/yr of paper pellets:
- 2008: 10,000
- 2009: 20,000
- 2010: 30,000
- 2011: 40,000
- 2012: 50,000
- 2013: 60,000

Tons/yr of wood:
- 2008: 0
- 2009: 0
- 2010: 0
- 2011: 0
- 2012: 0
- 2013: 70,000
Coal use is down as wood and paper pellets increased.
Historical background

• Solid fuel boiler constructed in 1984
• Fuels included coal/wood/waste residuals
• Wood from debarking operations related to pulp mill stopped when pulp mill shut down
• Started purchasing wood from outside sources to replace wood from pulp mill
• Improved system to increase throughput
Wood handling system

• Boiler permitted to burn 17 ton per hour
• Not able to consistently deliver wood to the boiler
• Opportunity to increase the use of wood if fuel handing system could be upgraded
• Bioenergy Grant helped fund the improvements
Improvements

• Replace/eliminate high maintenance conveyors
• Shorten the blow line and reduce the number of elbows from 12 to 5 to increase throughput and maintenance
• Speed up metering screws
• Result: increased throughput and decreased down time
Paper pellets

• Mixed with coal and blend is fed to the boiler
• Required R&T to evaluate and stack testing to confirm emission stayed constant or decreased
• Permitted to use up to 30% paper pellets
Semi trucks deliver wood
Trucks unload into reclaimer
Wood is metered onto conveyor
Magnet used to remove metal
Disc screen
Small material passes through
Larger material hogged
Rotary airlock to transfer material to blow line
Blow line from rotary feeder
Metering bin
Slow turning screws drop wood down chutes
Chutes from metering bins to boiler
Fuel feeder
Wood chutes have use air to push fuel into boiler furnace
Traveling Grate Spreader Stoker