Metso’s LignoBoost process provides kraft mills with a simple, efficient method to isolate lignin and use it as a biofuel or sell it for bioproducts.

By Cindy Macdonald, editor

A recent trip to Sweden presented Pulp & Paper Canada with an opportunity to see Metso’s LignoBoost system in action.

This add-on to the kraft pulping process extracts lignin from black liquor, permitting the solid powder to be sold as a chemical or a fuel, or used in-house as a fuel for the lime kiln.

The LignoBoost technology development started in the '90s with the patent application filed in 2006 by the Swedish research institute Innventia and Chalmers University, and sold to Metso in 2008. In recent years, using lignin produced by the LignoBoost pilot plant at Bäckhammar, Metso and Innventia have shown that lignin can be used as a fuel, either to replace or supplement coal or oil, or to enhance the heat value of wood pellets. In one mill trial, the dried and pulverized lignin was able to meet 100% of the fuel requirements for the lime kiln.

Equipment for LignoBoost constitutes a stand-alone plant, installed in parallel to the evaporator line. A portion of the mill’s black liquor is redirected to the LignoBoost process, where carbon dioxide is added to the black liquor to cause the lignin to precipitate. The lignin-lean black liquor returns to the mill process stream, while the lignin is pressed and treated with H₂SO₄. Then it is washed and pressed again. The two vertical plate pressure filters are the heart of the LignoBoost plant, says Anders Larsson, manager, marketing and sales of LignoBoost for Metso Power.

A typical LignoBoost installation would have two or three VPA pressure filters, piping, precipitation equipment, optional CO₂ storage tanks, valves, heat exchangers, scrubber, vacuum pump and fan, process pumps and tanks, and belt conveyors.

The pilot plant at Bäckhammar, Sweden, can produce about 1.2 tonnes/hour of lignin.

Larsson estimates the investment for a North American mill to install LignoBoost with a capacity of 40,000 tpa would be about $20-25 million to achieve 70% dryness, plus an additional investment if a drying plant is needed to bring the lignin to 95% dryness (which is needed if the material is to be dry-fired as a fuel).

Dry lignin at Bäckhammar awaiting distribution to various end-uses.

Powdered lignin in a bulk bag.

The vertical plate pressure filter is visible behind the railing is open, allowing the dried lignin to drop onto the inclined conveyor below.