



## STORA ENSO Lignin of tomorrow

BUSINESS MODEL: **Circular supplies**

### SITUATION

- Lignin is an organic polymer, high in calorific value, that is critical for the structure of cell walls in wood and bark.
- There are many potential markets and uses for lignin. Lignin can be used for replacement of phenols that are used in resins for adhesives in plywood and veneer applications, for example.
- Traditionally, the pulp industry has discarded lignin when creating paper and packaging - lignin is often used as an energy source for pulp mills.

### CHALLENGES

- Using wood more effectively and increasing the production of available marketable products beyond pulp.
- Stora Enso wanted to decrease its reliance on fossil fuels, while at the same time benefiting from a potential business opportunity by selling lignin.

### SOLUTION

- Stora Enso's Sunila Mill in Finland is the world's first integrated lignin extraction plant to produce dry kraft lignin and fire it directly in the mill's lime kiln and replace fossil-based fuel.
- Sunila's lignin can be packed for sales to external customers. The pulp-based biorefinery allows for replacing fossil products with renewable products, made in industrial processes that use biomass as an energy source.
- Since the main part of the Sunila equipment is placed indoors, a proper design for the gas collection system was crucial to ensure safety. The atmosphere in the dryer area is kept inert and non-explosive by utilizing flue gases from the lime kiln with low oxygen content together with nitrogen as purge gas. The safety systems developed in the project have proven to be effective and there have been no safety-related incidents. The plant is now operating at a high production level.

### QUANTITATIVE INFORMATION:

- So far, Sunila Mill is replacing 70% of the natural gas in the lime kilns with lignin, meaning that we reduce our fossil CO<sub>2</sub> emission by 27,000 tonnes per year. The target is to increase this, which will most likely be possible after some modifications have been made at the mill.

### KEY BENEFITS

- Business
  - Stora Enso can sell lignin to external customers.
- Sustainability
  - By utilizing a greater part of wood, lignin contributes to resource efficiency.
  - The lignin is made of sustainably sourced wood.
  - Stora Enso's Sunila Mill has both FSC and PEFC chain-of-custody certification

Link: <http://www.storaenso.com/newsandmedia/lignin-of-tomorrow>