

# Potential Uses of Petroleum Coke in Kraft Pulp Mills



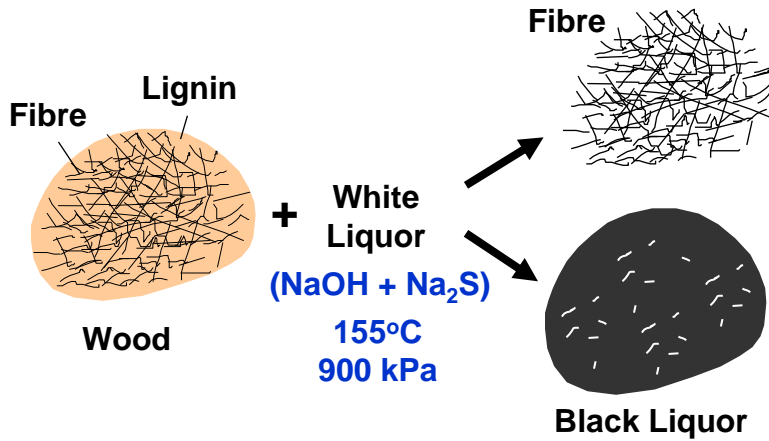
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Future Utilization of Petroleum Coke Meeting  
University of Calgary, December 11, 2007

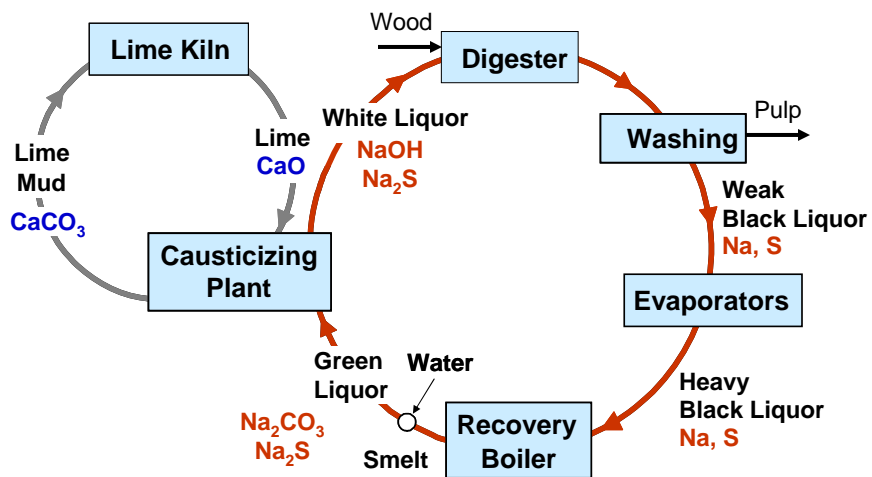
## Kraft Pulping Process

- **Most important chemical pulping process**
- **Global kraft pulp production: 130 million metric tons/year (67% of total)**
- **Advantages**
  - **High pulp strength**
  - **Versatility - ability to handle a wide range of wood species**
  - **Favorable economics - High chemical recovery efficiency (96 - 98%)**

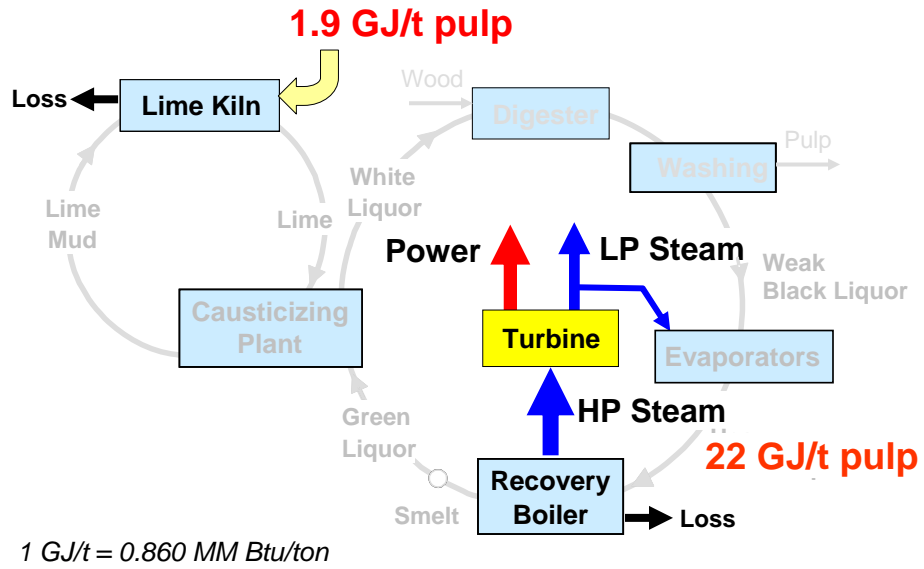
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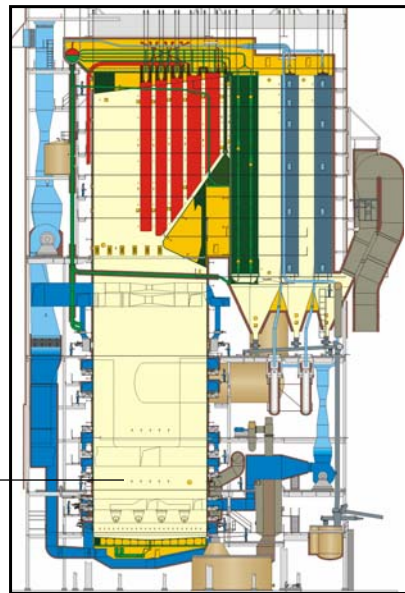
# Kraft Recovery Process



# Energy Recovery & Consumption

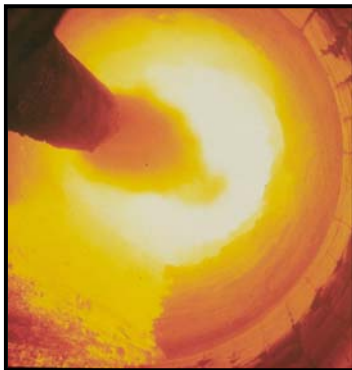


## Recovery Boiler



Courtesy of Andritz

## Lime Kiln



## Potential Petcoke Utilization

- Replace natural gas as fuel for lime kilns
- Increase heat input to recovery boilers
  - Increase steam and power production
  - Increase smelt reduction efficiency
  - Decrease SO<sub>2</sub> emissions
  - Facilitate borate autocausticizing reaction
- Produce heat for drying mill sludges and biomass
- Produce syngas

## Potential Benefits of Burning Petcoke in Lime Kilns

- Lower energy cost
- Lower dusting
- Lower S makeup requirement

## Potential Problems

- Unburned carbon in pulp
- High S input
  - Na and S imbalance
  - High liquor sulphidity
  - Increased use of makeup caustic
  - High TRS and SO<sub>2</sub> emissions
  - Increased Na<sub>2</sub>SO<sub>4</sub> deadload
  - Increased ring formation

## Potential Problems

- **Poor lime quality**
  - Low availability
  - Low reactivity
- **Accumulation of non-process elements (NPE), particularly vanadium**
  - Recovery boiler corrosion
  - Mud settling and dewatering
- **High heat input**
  - Refractory damage
  - Chain damage