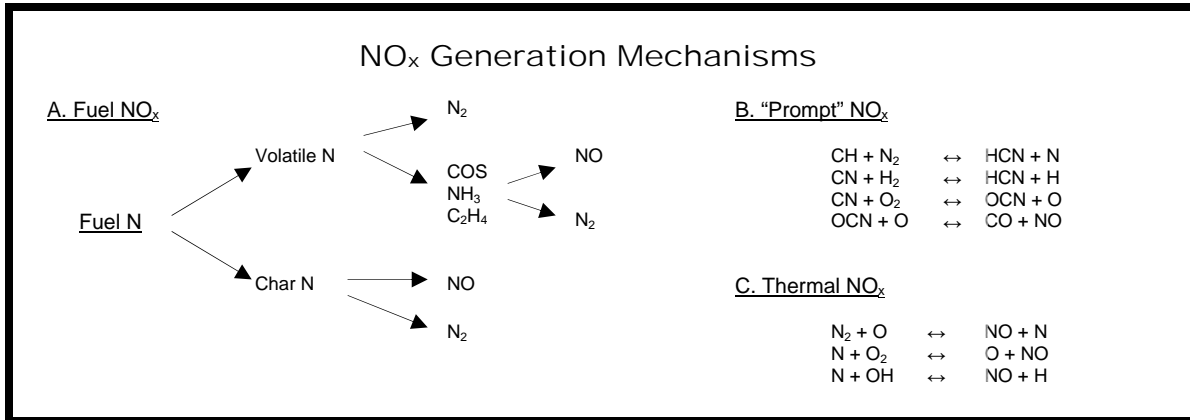


# PROJECT CAPABILITIES



## NO<sub>x</sub> EMISSIONS REDUCTION



### Background

Many plants are facing stricter NO<sub>x</sub> emission limitations from boiler stack gases in the near future. Often, NO<sub>x</sub> emissions must be reduced by more than 50% from current levels.

### Jansen's Approach to Solving NO<sub>x</sub> Issues

1. Understanding the customer's goals
2. Understanding the local environmental permitting constraints.
3. Evaluating the current boiler operation to:
  - a. Determine current NO<sub>x</sub> creation mechanism
  - b. Analyze the physical arrangement of the combustion system; size of furnace, location of existing burners and air supply
  - c. Determine operating strategy/control, fuel splits, load variability
  - d. Establish fuel properties
4. Perform Computational Fluid Dynamics (CFD) modeling to predict effectiveness of types of solutions.
5. Evaluating types or combination of NO<sub>x</sub> reduction solutions for most viable and cost effective solutions. Determine capital cost and operating costs as well as "side effects" of proposed solutions.
6. Providing operating recommendations and hardware alterations that best meet the customers' goals. Where appropriate, possible solutions may include:
  - Staged combustion/overfire air
  - Low excess air
  - Fuel rich secondary combustion (reburning)
  - Urea/ammonia injection (SNCR)
  - Flue gas recirculation (FGR)
  - Low NO<sub>x</sub> burners
  - Automatic combustion controls
7. Design and supply specific NO<sub>x</sub> reduction technology and equipment.

### Selected References (see next page)



## **Selected References**

Boise - International Falls, MN  
Boise - Wallula, WA  
Georgia-Pacific Corporation - Crossett, AR  
International Paper Company - Roanoke Rapids, NC  
International Paper Company - Texarkana, TX  
MeadWestvaco Corporation - Covington, VA  
MeadWestvaco Corporation - Phenix City, AL  
Simpson Tacoma Kraft - Tacoma, WA  
Smurfit-Stone Container Corporation - Hodge, LA  
Smurfit-Stone Container Corporation - Missoula, MT  
Smurfit-Stone Container Corporation - Stevenson, AL  
Stora Enso North America - Wisconsin Rapids, WI  
Veolia Waste-to-Energy - Burnaby, BC  
Weyerhaeuser Company - Valliant, OK