Alaska Northern Forest Cooperative

Biomass and Small Tree Utilization
Wood Energy and Business Opportunities for Interior Alaska

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Wood Use Opportunities

Cofiring Wood and Coal for Electrical Generation

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Background / Motivation

**Concept paper- cofiring wood and coal**

- prepared for Chancellor Jones, University of Alaska Fairbanks
- at the request of Andy Mason, Director of Alaska Region State & Private Forestry, USDA-FS
Scope

► preliminary paper providing an overview of key issues
► not intended to provide detail re: technical, engineering or economic feasibility

Status

► open review and comment (July-Aug.)
► draft completed (Sept.)
Background

- Reduce hazardous fuel loadings within Fairbanks North Star Borough
- ~ 250 acres removed to date
- ~ 5,000 additional acres expected over the next 5-10 years
- shearblade, windrow, burn on-site
birch stand near Fairbanks
Past cofiring research- wood and coal

**Interior Alaska**

“Cofiring of wood chips with coal in interior Alaska”
Sampson, Richmond, Brewster, Gasbarro
Forest Products Journal. 1991

**Other regions**
Numerous co-firing trials and case studies
*Florida, Kentucky, New York, Michigan*
Local coal plants considered:

- University of Alaska Fairbanks
- Aurora Electric
- Fort Wainwright
- Eilson Air Force Base

Healy plant not considered (pulverized coal)
A few numbers......

Combined capacity:
- ~85 megawatts (MW) capacity
- ~600,000 tons coal per year

- typical co-firing rate:
  approx. 10 percent of fuel mix
Perspectives of local coal plant managers

- wood fuel issues
- equipment modifications
- fine tuning plant operating conditions
- fuel mixing procedures
- long term procurement contracts
Biomass availability

► **WUI clearings**
  ■ *small diameter, includes bark & foliage*

► **sawmill residues**

► **woody landfill materials**

► **harvesting residues**

► **economic volumes available?**
Harvesting and forest management considerations

- estimate 5,000 acres at 20 tons biomass per acre
- shearblading harvesting ~$150 per acre
- transportation costs ~0.25 per green ton-mile
- chipping / loading costs?
Harvesting and forest management considerations

- appropriate scale of operation
- in-woods chipper / dump truck
- chip vans
- concentration yard
- biomass storage
Summary

Fairbanks advantages

- Flexibility -- four local coal plants.
- Transportation distances -- relatively short
- Terrain -- relatively gentle
- Past successes -- test burns with wood and coal
- Air quality -- potential improvements (N, S gases)
- Landfill -- potential reduction of material
Contributors

The following are acknowledged for their helpful contributions-

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