4/07/11 Presenta-tion: Biomass Boiler Heating Systems

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Biomass Boiler Heating Systems

Featuring the Delta Greely Biomass Project

September 16, 2010

Alaska and Biomass Boilers

- Alaska's Biomass Boilers
  - Craig, Tok, Delta Junction, Dot Lake
  - Modular Conex unit for Bush School Testing
  - Campbell Creek Science Center
  - Juneau, SeaAlaska (Pellet)
- Other States
  - Montana, Oregon, Idaho
- Department of Forestry – Research
- As well as several individuals who have dedicated themselves to biomass research

Types of Systems

- Residential / Commercial Systems
- Cord Wood, Pellet, or Wood Chip

Feasibility Assessment

- Evaluation of Pay Back
- Fuel Cost Comparisons
- Sources of Fuel
- Support From State and Federal Agencies
- Cost of Construction

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Key Components and System Considerations

Fuel Source

Fuel Source

Wood Chip quality and delivery

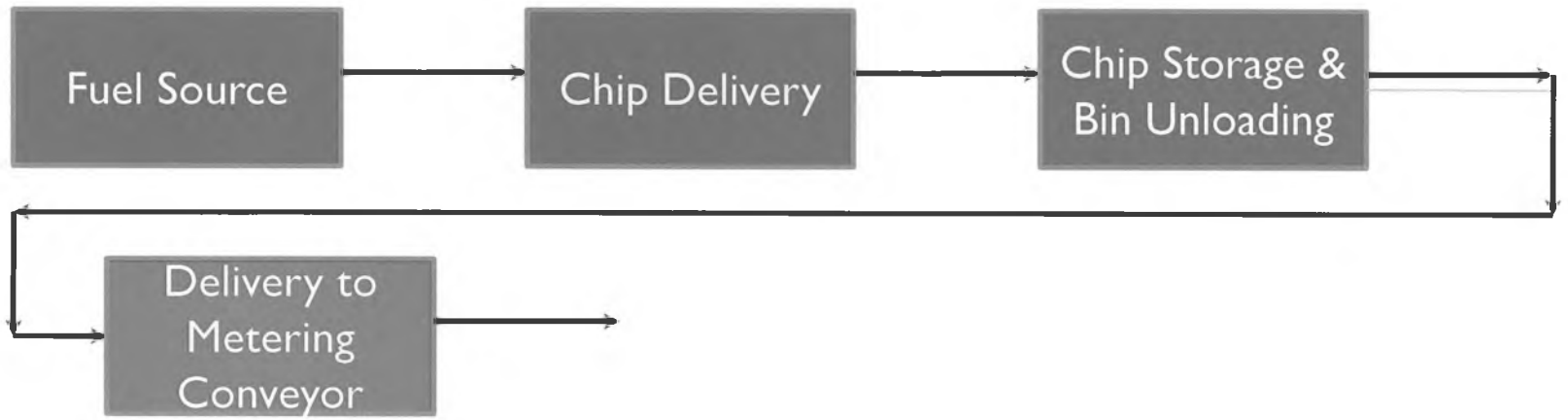
- Verify the quality and quantity of fuel
- Wood chip quality is directly related to boiler efficiency
- Assess the availability of pellets in the future

Wood Chip Delivery & Storage

Wood Chip Delivery

- Determine type of trucks that will be used to deliver chips
  - Walking floor, conveyor floor, dump style, heated, larger semi trailers, or standard dump trucks
- The truck type has a large impact on the approach to the storage building and bulk delivery to the boiler
- Chip storage

Chip Handling

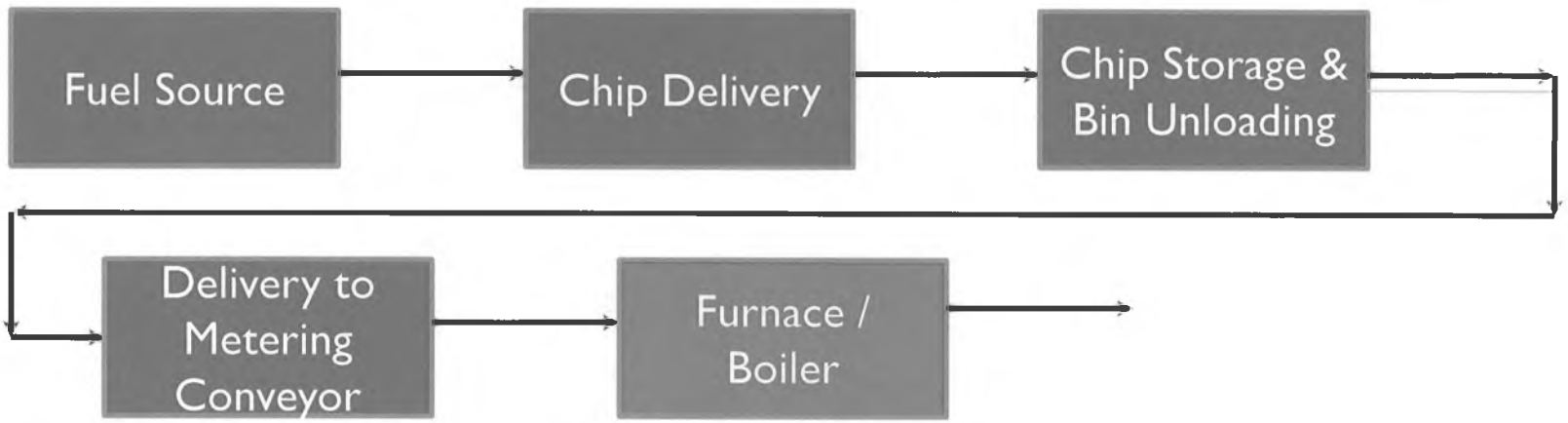


Conveyor Systems

Options:

1. Bulk delivery by sliding chain/bar conveyor
2. Belt conveyor to a shaker screen for removal of large chips (if required)
3. Screw conveyors for delivery to the fire grate

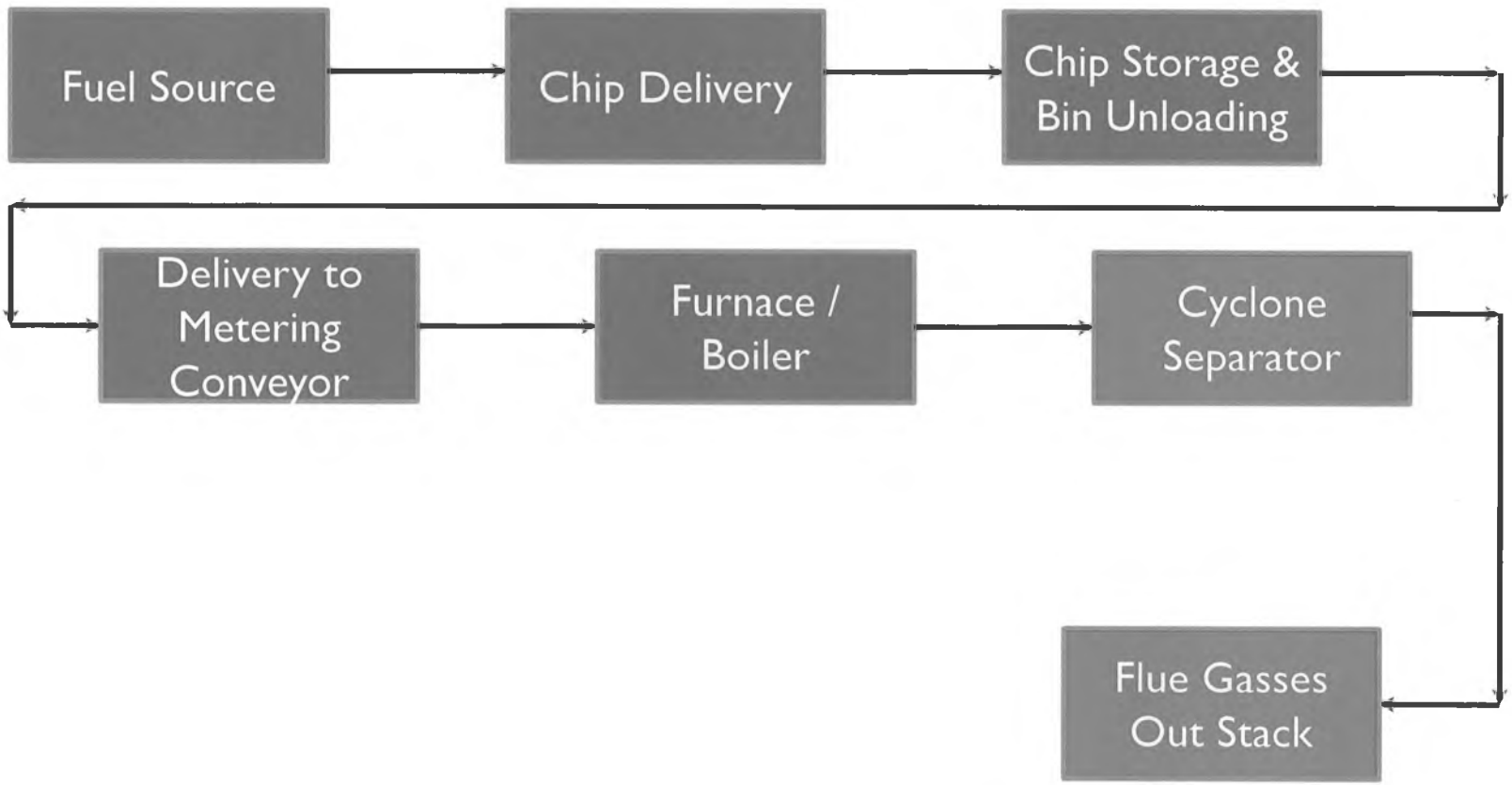
Furnace / Boiler



Boiler System

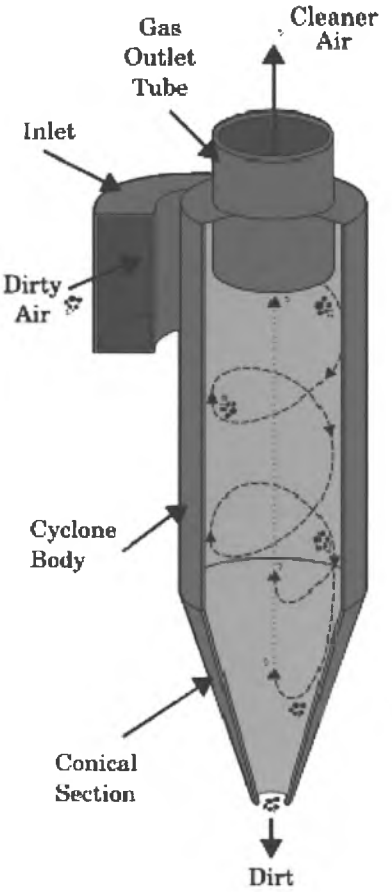
- Gasification System
  - Fixed grate, conveyor grate, step grate
- Boiler – fire tube, hot water, 30 psig
- Vendors

Furnace / Boiler

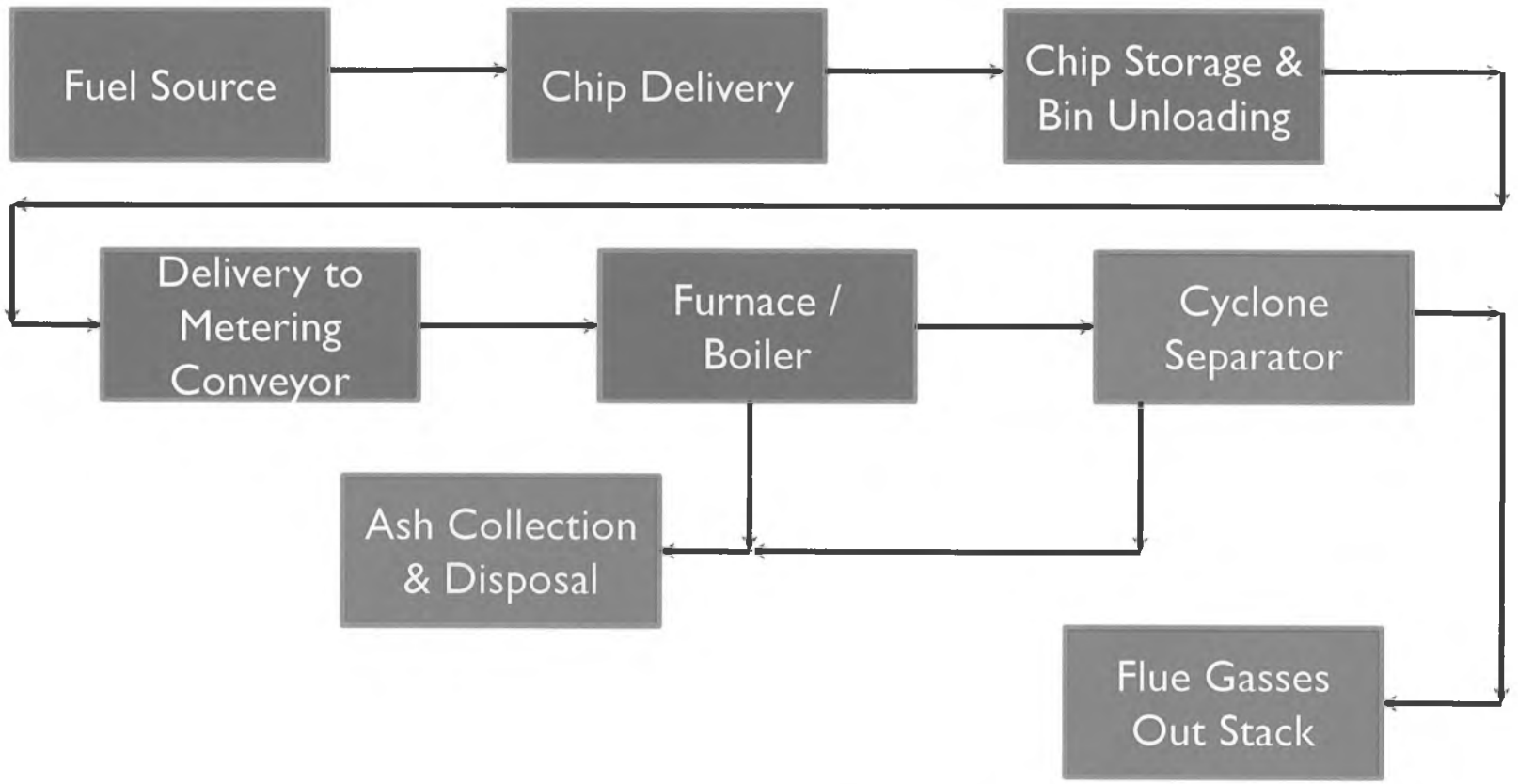


Flue Gasses

- Flue gasses will run through a cyclone separator or electrostatic precipitator
- Stack is usually 65+ ft tall and penetrates the roof
- Stack height is analyzed based on wind, other buildings and obstacles to determine the most efficient dispersion height



Furnace / Boiler



Ash

- Ash is collected for removal from the facility
- Collection/removal may be automated or manual
- Disposal options:
  - Concrete mix
  - Soil mix
  - Dispose at the land fill
  - Farm/Garden soil additive

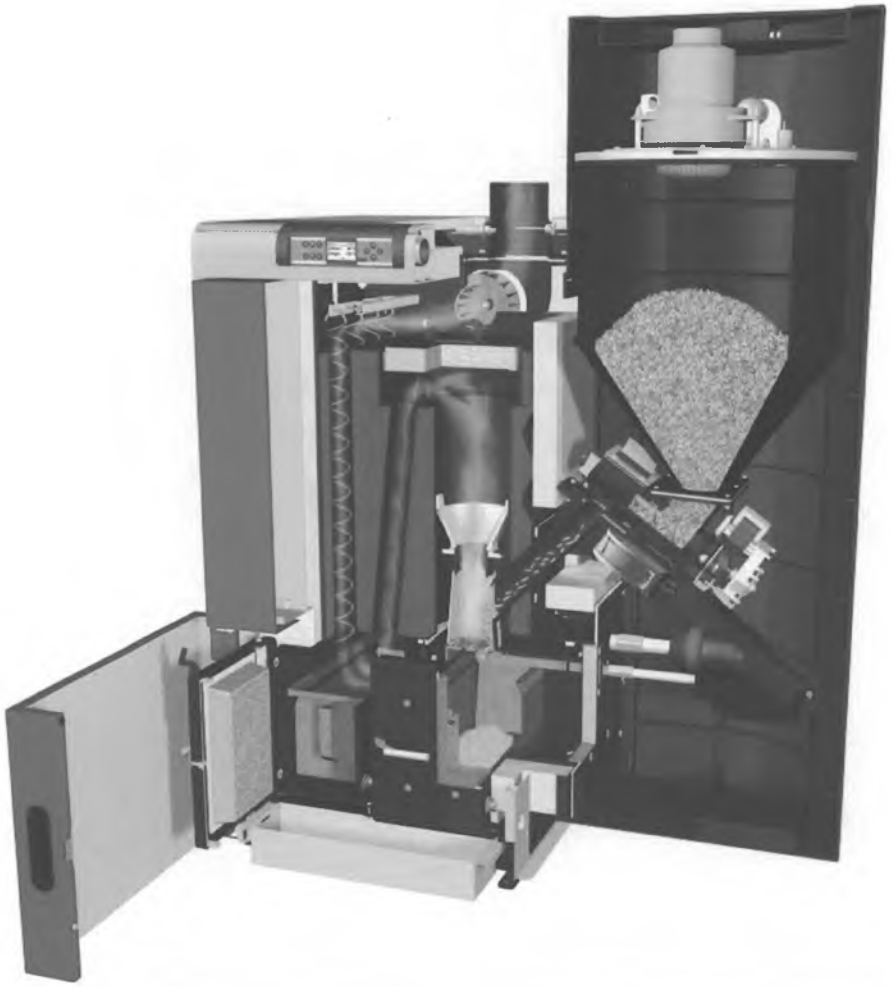
Structure

- Boiler Building
  - Pre-engineered metal building with insulated panels on a concrete slab
- Wood Chip Storage
  - Concrete bunker with either a pre-engineered metal structure or fabric structure cover.
- Wood Cylo feeder system

Permits & ADEC

- Permit/ADEC – Discussions required
  - Emission calculation will be required to confirm

Questions?



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