

Advanced Wood Biomass Heating



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Benefits of Wood Biomass Energy

- Reduce and stabilize fuel costs
- Provide fuel flexibility
- Local renewable fuel
- Clean, efficient, scalable
- Keep dollars in regional forest economy
- Support forest management

Traditional Wood Fuels

Cordwood



Residential Heating
Small buildings

Chips



**Commercial and
institutional heating**
**Utility-scale power
production**

Pellets



Residential Heating
**Small Commercial
and Institutional
Heating**

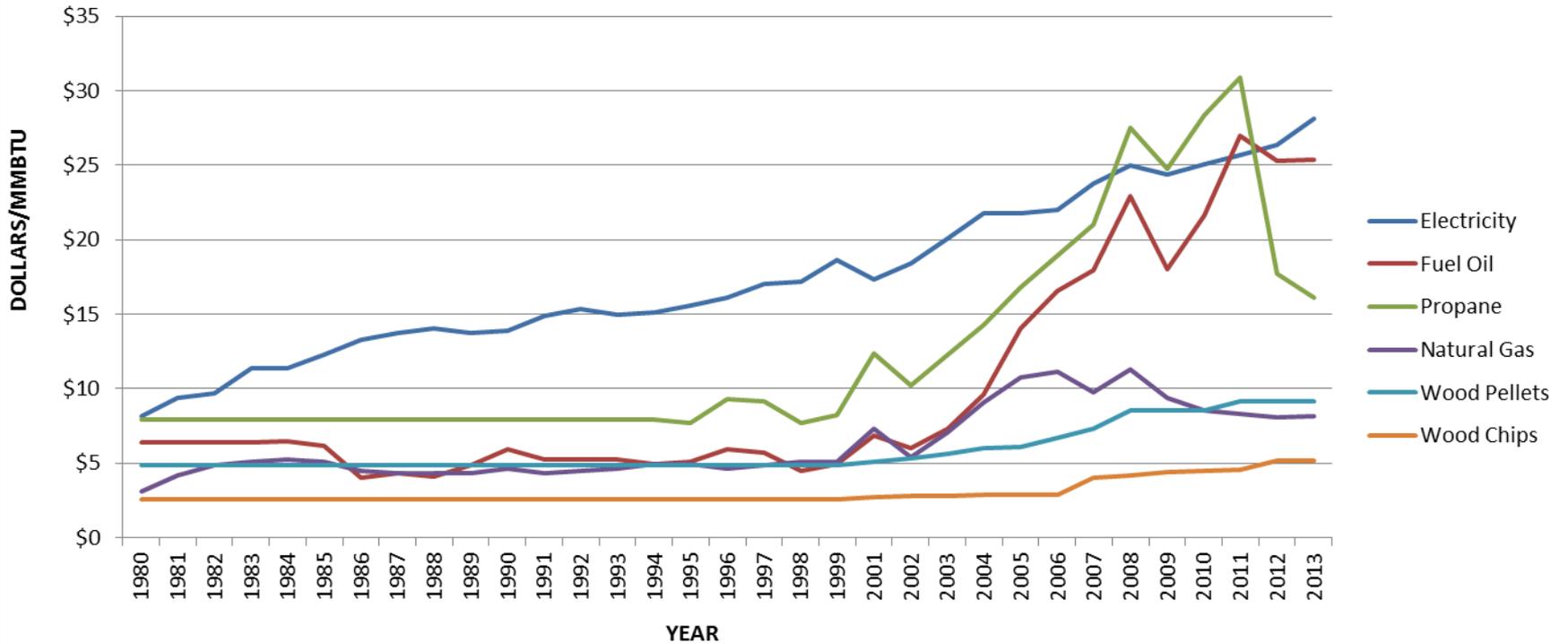
Where Wood Works Best

- Where heat demand and/or fuel costs are high
- With facility enthusiasm (& capacity)
- Near a forest or wood pellet fuel source
- Near local logging infrastructure (mills/chippers/trucks)
- Near other wood energy users
- New construction projects

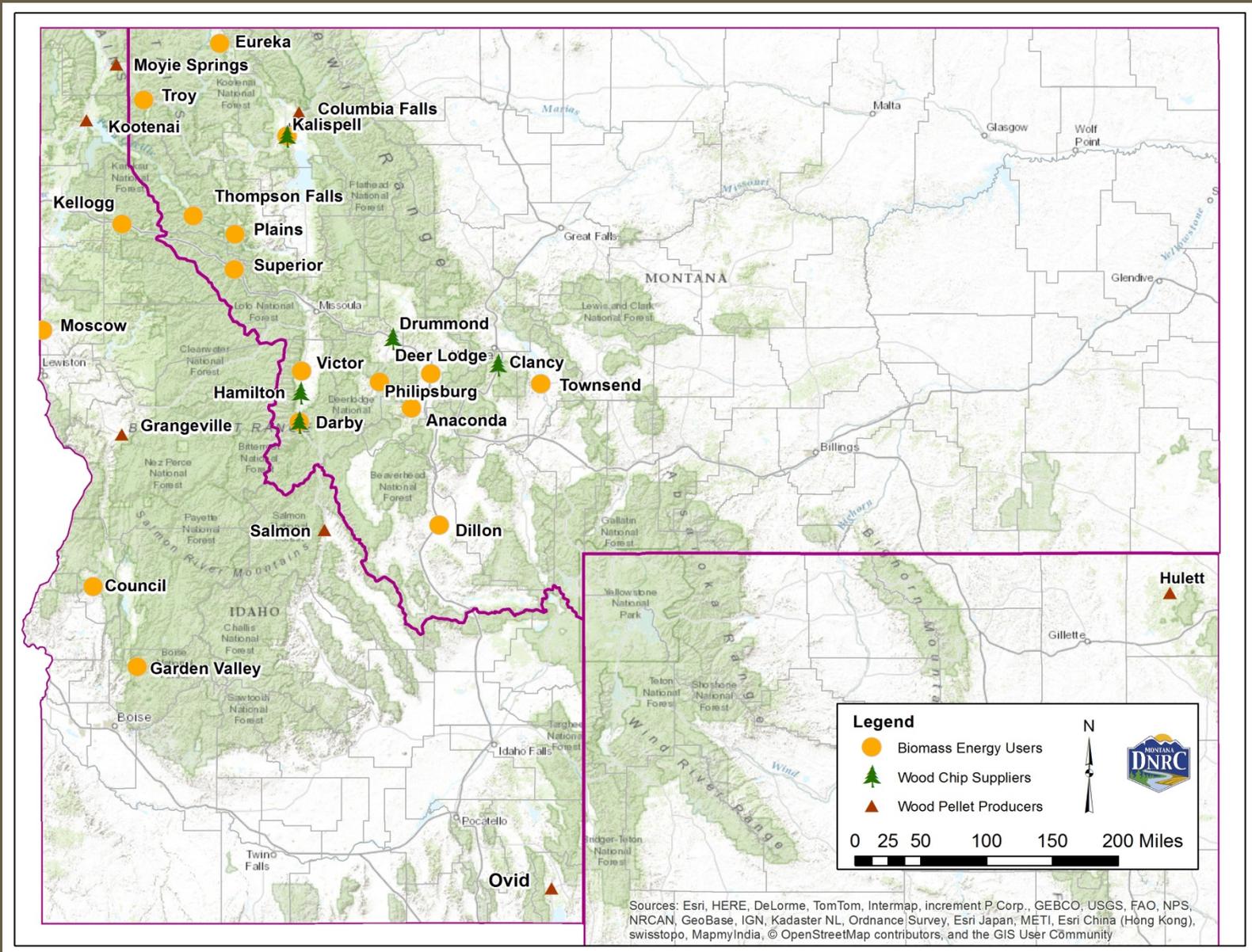


Heating Fuel Prices, Montana

Average Price of Heating Fuels, Montana, 1980-2013
(Dollars per MMBTU)

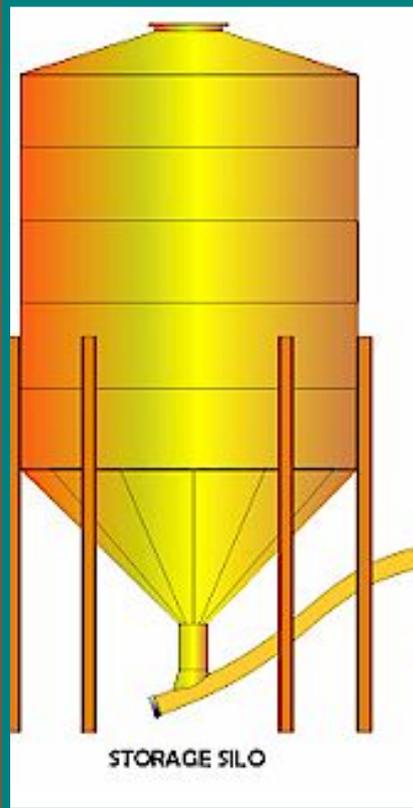


Biomass Fuel Users and Suppliers



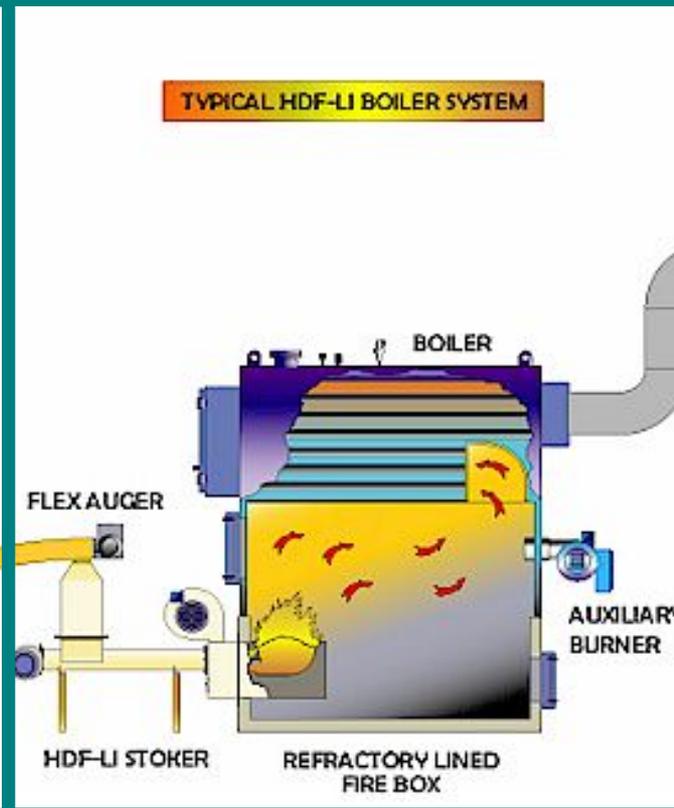
Biomass Heating System Configurations

Fuel Storage



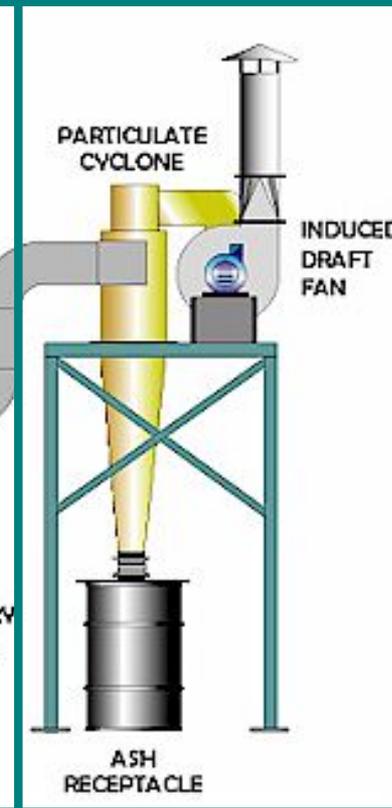
Pellet Silos
 Slab chip bins
 Below grade chip bins

Combustion Equipment



Stoker/fixed grate
 Stoker/moving grate
 Pneumatic/suspension
 Fluidized bed

Emissions Control Equipment & Stack



Single cyclone
 Multi-cyclone
 Baghouse
 ESP

Small-scale thermal biomass energy technologies



Biomass Thermal Energy Installations



Clark Fork Valley **Hospital**, Plains, MT



Grant County Regional **Airport**, Oregon



Victor **School**, Victor, MT

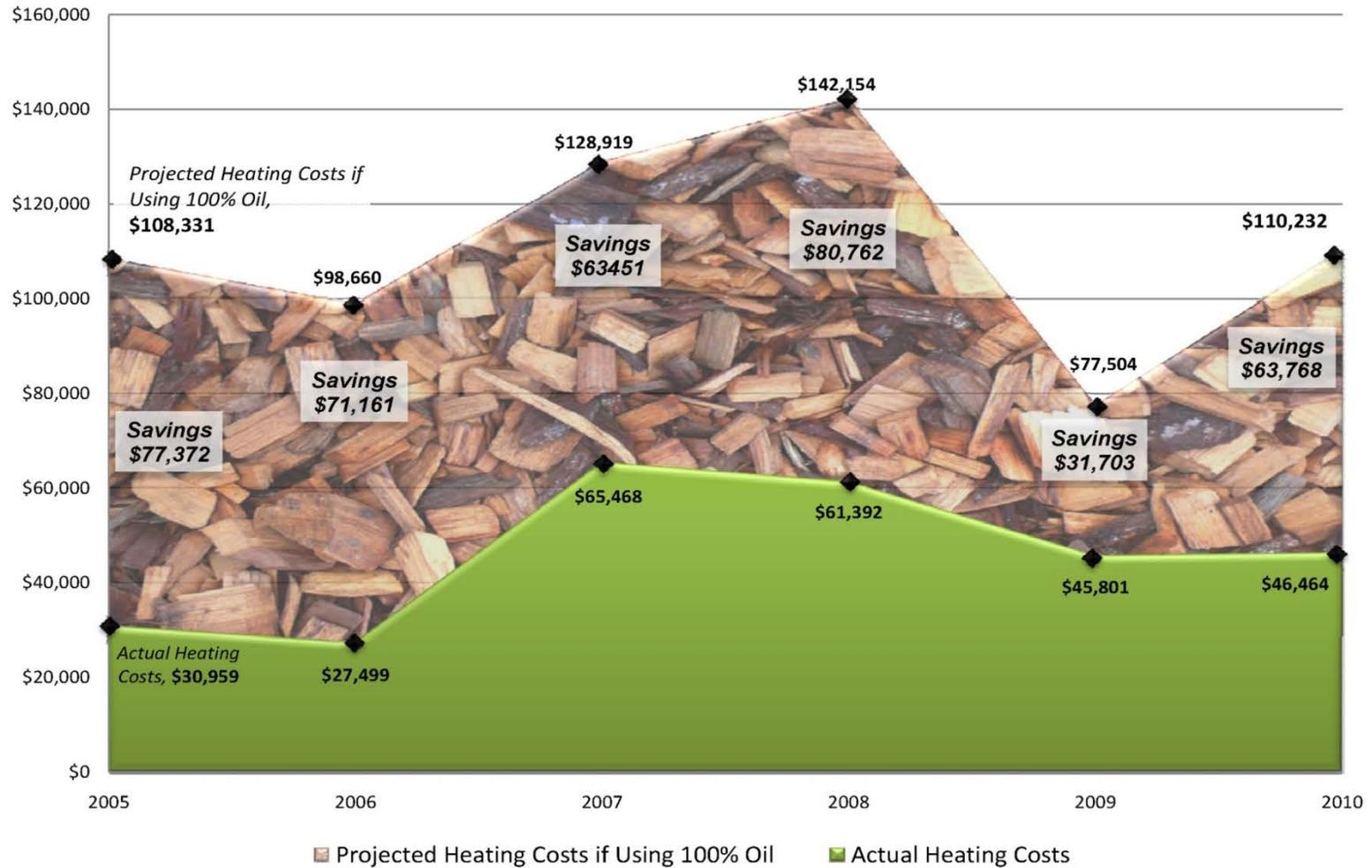


Bridger Bowl **Ski Area**, Bozeman, MT

Proven Returns on Investment

- Montana biomass energy users saving 25-75% off energy costs
- Displacing 50-90% of fossil fuels

Thompson Falls School Fuel Cost Savings



Darby School: Fuels for Schools Community Partnership



Grants and Assistance for Wood Biomass Energy

- **Grants**
 - Preliminary technical/economic feasibility assessments (up to \$3,500)
 - Engineering and design

- **Biomass Resource Supply Assessments**

- **Guidance on Financing Options**

- **Tours of Existing Biomass Energy Installations**

OTHER:

Wood Innovation Grants, USDA Forest Service

USDA Rural Development

Website: <http://dnrc.mt.gov/forestry/assistance/biomass>

