



Modern Wood Heating for Healthcare Facilities

Introduction to how wood biomass energy can benefit your healthcare facility—
saving you money in operations while investing in your local community.

March 5, 2015

*This webinar is co-sponsored by Frontier Medicine Better Health Partnership,
Montana Department of Natural Resources and Conservation, Montana Wood
Energy Team, Idaho Statewide Wood Energy Team and USDA Forest Service*



Quick Notes

- Open audio
- Please mute phone during presentations.
- Save questions for end of presentations.
- Recording of webinar and slides available later. Registrants will be notified by email.

Webinar Outline and Speakers

- Welcome
 - *Denyse Traeder, Frontier Medicine Better Health Partnership*
- Introduction to Modern Wood Heating: Benefits, technology options, biomass fuel supply, and environmental health considerations
 - *Julie Kies, Montana Dept of Natural Resources and Conservation*
- Experience from hospital administrator and maintenance staff
 - *Barry Fowler, Director of Human and System Resources, Clark Fork Valley Hospital*
 - *Jason Williams, Facility Services Manager, Clark Fork Valley Hospital*
- Financial assistance available
 - *Julie Kies, Montana Dept of Natural Resources and Conservation*
 - *Matt Wiggs, Idaho Office of Energy Resources*
- Q&A Session



THE FRONTIER RURAL HEALTH NETWORK'S FRONTIER MEDICINE BETTER HEALTH PARTNERSHIP (FMBHP)



What is the **FRHN - FMBHP**?



- An innovative, evidence-based, community responsive infrastructure of CAH Communities:
 - **The “voice of data-driven frontier medicine”**
 - **Leverages strategic resources to develop relevant, evidence based models of care, cost savings, and care delivery throughout Montana**

FMBHP Goal: Achieve the Triple Aim



“To improve health outcomes for frontier and rural populations, patients, and communities while lowering total expenditures and improving patient satisfaction.”



Guiding principles:



- Rural and frontier communities need a voice in identifying and addressing health care needs.
- CAHs and Community Providers are vital components in the health of their communities.
- Community-engagement, robust data collection, monitoring, benchmarking, and evaluation are needed to successfully address community needs.
- Providing appropriate health care locally will increase access and patient satisfaction, improve quality and decrease costs.
- Workforce training must be tailored to meet identified needs and support patients in lower cost and community based settings.

FMBHP Pillars



**Community
Engagement**

**Data-driven
Best
Practices**

**Integrated
EHR system**

**“Just in Time”
Inter-
Professional
Workforce
Development**

**Rural
Participation
in Value-
Based
Purchasing**

Thank You for Participating



For more information, please contact:

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Introduction to Modern Wood Biomass Heating

- Benefits
- Technology
- Fuel supply
- Environmental health considerations

Julie Kies
Forest Products and Biomass Program Manager
Montana Department of Natural Resources and Conservation



Benefits of Wood Biomass Energy

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

Wood Energy in Healthcare Facilities

Notable Numbers:

- **43 hospitals** in rural, suburban, and urban areas across the U.S. use wood energy.
- **18 facilities in Montana and Idaho** use wood energy. This includes **2 hospitals**, 12 schools, 2 universities, and 2 state buildings.
- **16 states** currently have hospitals that use wood energy.
- Hospitals collectively **save nearly \$8 million** annually in fuel costs by using wood instead of fossil fuel or electricity.
- On average, each CAH with a wood energy system **annually saves about \$200,000** by using wood energy.

Traditional Wood Fuels

Cordwood



Residential Heating
Small buildings

Chips



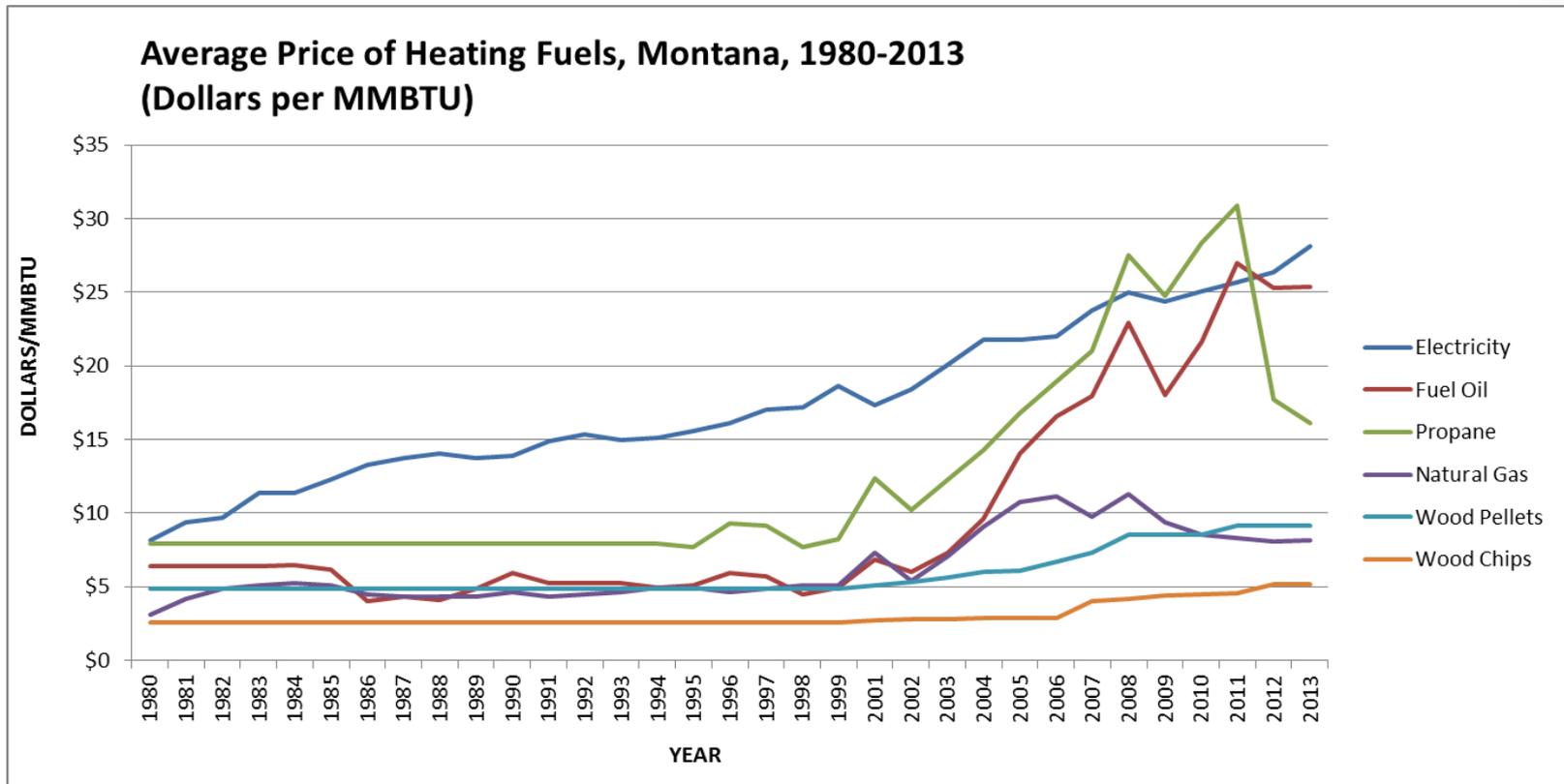
Commercial and
institutional heating
Utility-scale power
production

Pellets



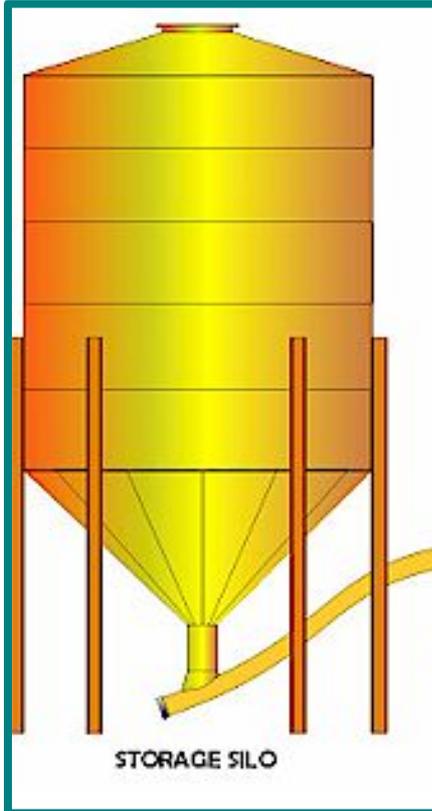
Residential Heating
Small Commercial
and Institutional
Heating

Heating Fuel Prices, Montana

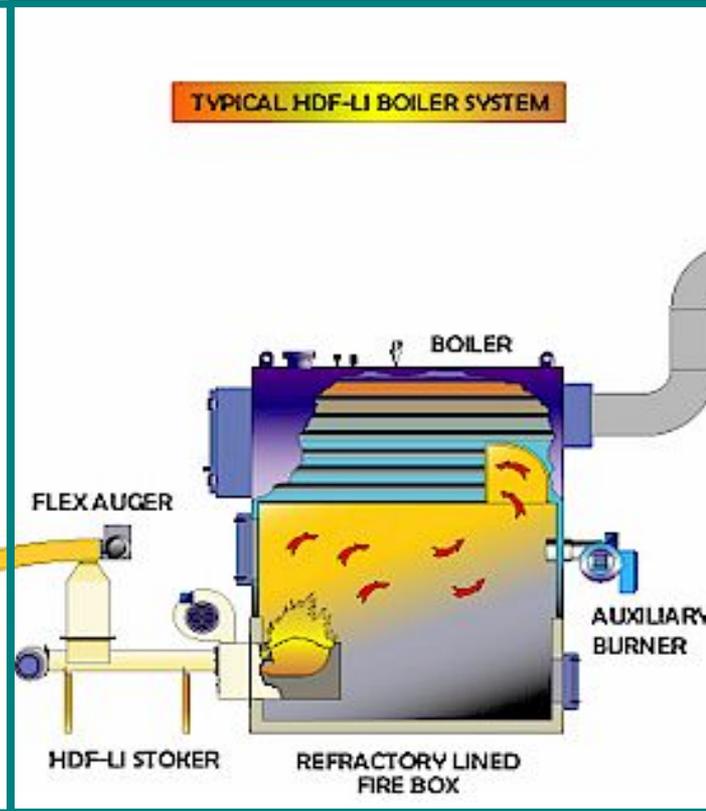


Biomass Heating System Configurations

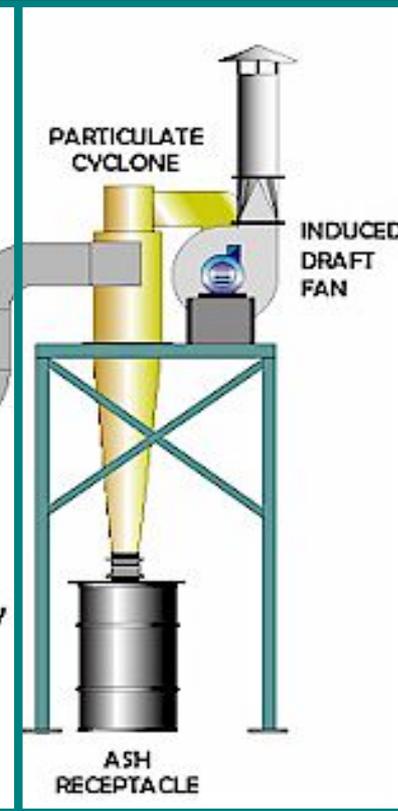
Fuel Storage



Combustion Equipment



Emissions Control Equipment & Stack



Pellet Silos
 Slab chip bins
 Below grade chip bins

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

Single cyclone
 Multi-cyclone
 Baghouse
 ESP

Boiler Houses and Fuel Storage Examples



Clark Fork Valley Hospital, Plains, MT



Mineral Community Hospital, Superior, MT

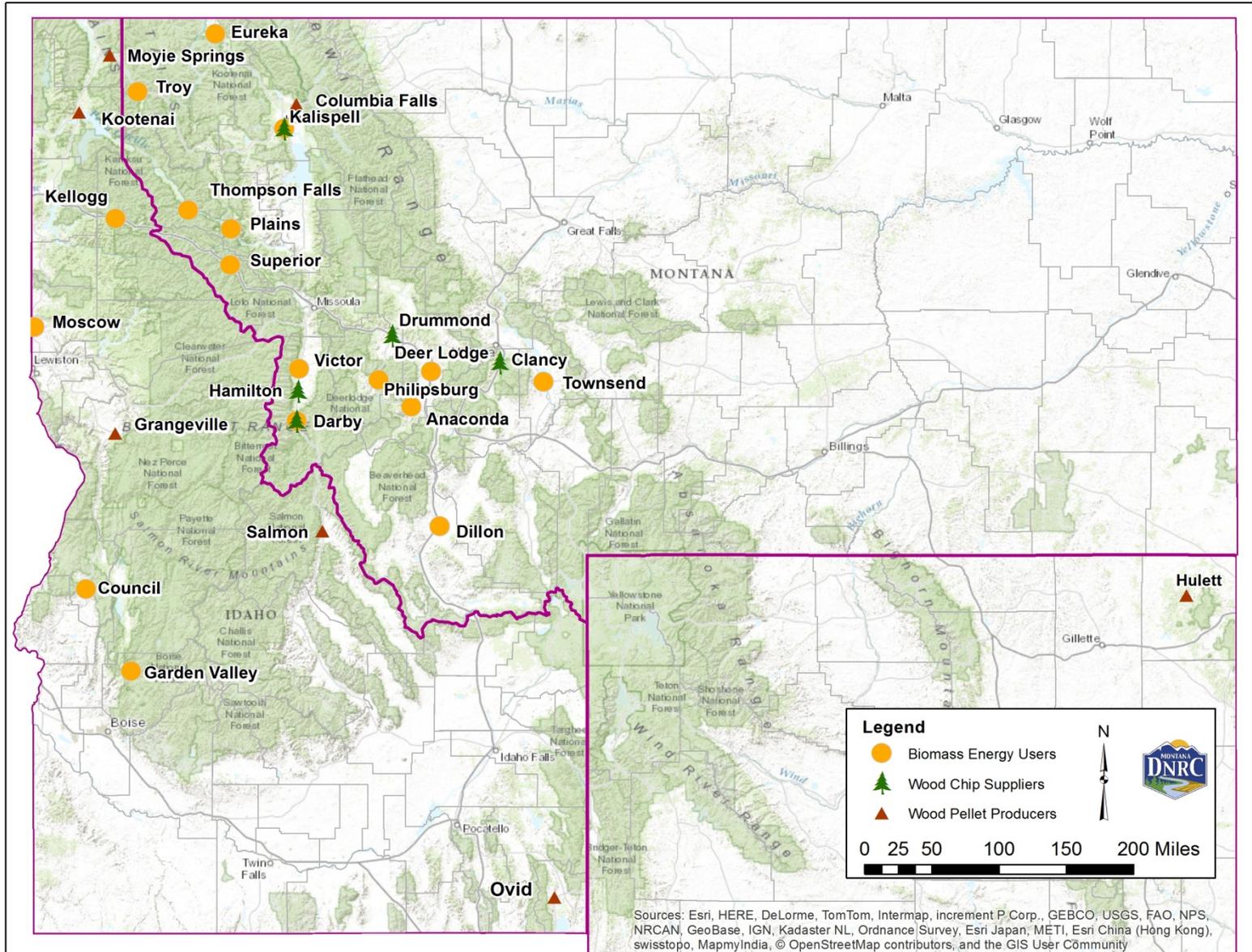


Victor School, MT



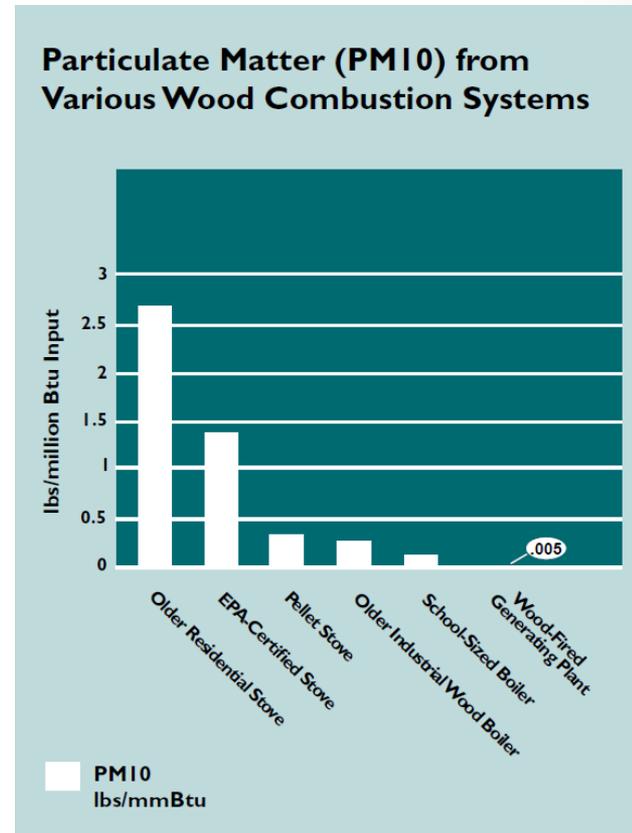
Townsend School, MT

Biomass Fuel Users and Suppliers



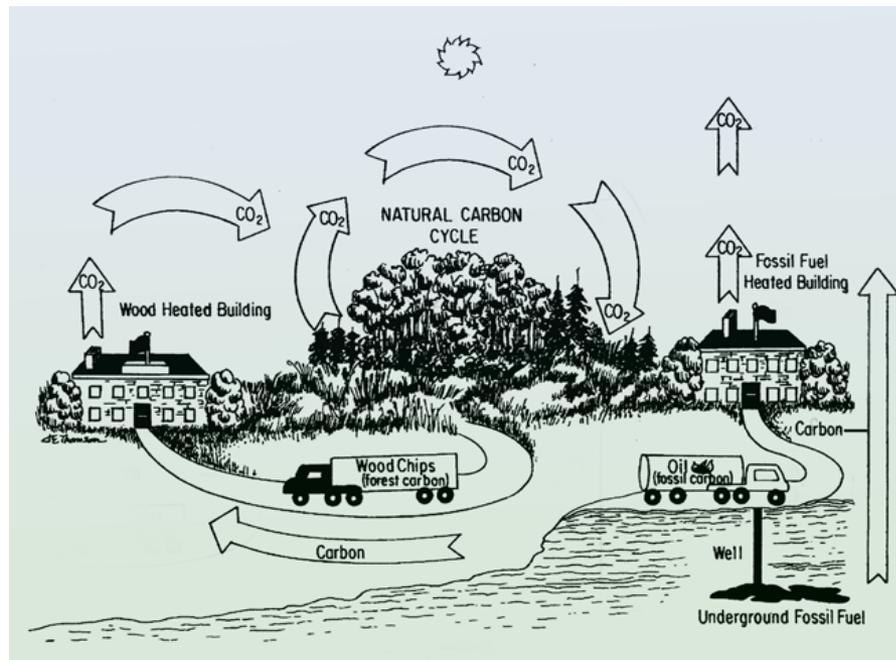
Environmental Health Considerations: Air Emissions

- Particulate matter (PM), CO, NO_x, SO_x
- Wood fuel characteristics affect amount/composition of PM emissions
- Consult with air regulators on local regulations. They may advise on correct stack height to disperse emissions
- Add-on pollution control devices are available



Environmental Health Considerations: Carbon and Climate Change

- Carbon neutral fuel if harvested sustainably
- Biomass C is already part of the atmospheric C cycle
- Thinned forests exhibit higher growth rates sequestering C in larger trees



Environmental Health Considerations: Forest Sustainability

- Source wood fuel from responsible harvest practices from state, federal, private, tribal, community lands, or mill residue.
- Markets for biomass support economic viability of forest management and fire mitigation to protect water, air quality, wildlife habitat, recreation, etc.



Where Wood Works Best

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



Wood Heating for Healthcare

Sustainability and the “Bottom Line”

Barry Fowler – Director of Human & System Resources

| March 5, 2015

Jason Williams – Facility Service Manager

Clark Fork Valley Hospital ~ Plains, MT

Nice Cleaver Brooks Boilers!



The Challenge

- No natural gas source in our town.
- Propane our primary source of heat.
- 8,000 gal tank
- Negotiations / changed supplier
- 60,000 sq ft – 28 bed LTC, 16 bed Acute Care, Food Service, Internal Laundry
- CTA building design included space for bio-mass
- Local Project negative impression
- CTA revisited us with McKinstry
- Submitted Grant Proposal with McKinstry assistance

30,000 Gallon Submarine



PROPANE

Opportunity at CFVH

- Pain of High Utility Costs
- Identified Opportunities with Energy Audit
- Quantified Cost and Savings
- Pulled in Grant Money

Economics of CFVH Project

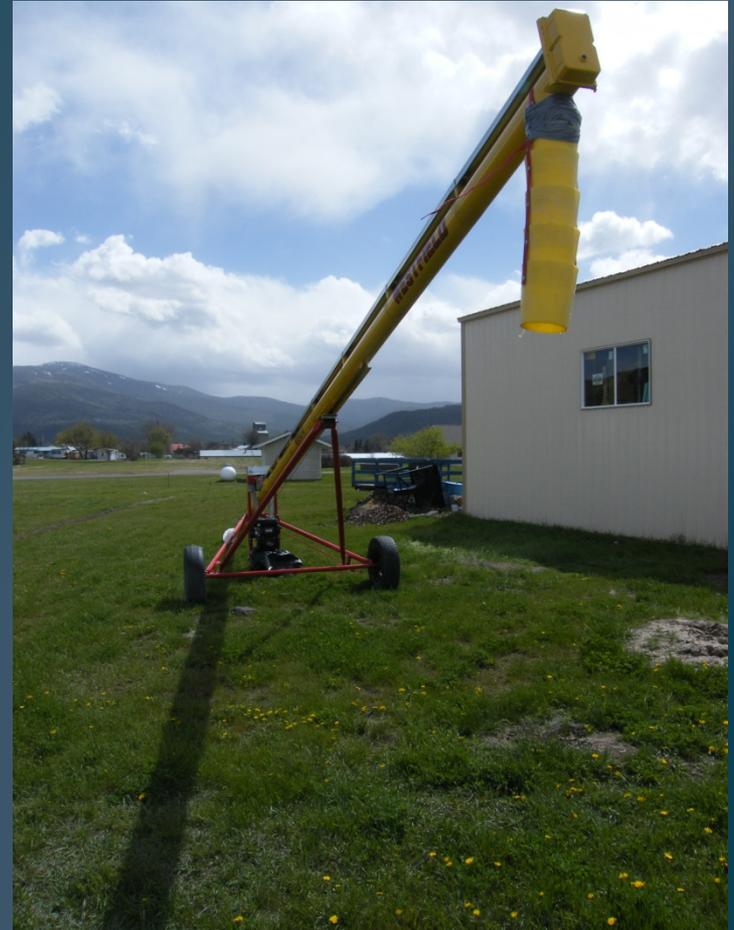
- Fuel Switching
- GMAX Project Cost = \$368,833
- DNRC Grant = \$139,000
- Guaranteed savings = \$19,505 (annual)
- DNRC Pay for one year fuel = \$20,700
- 11 year payback, positive cash flow in year 8
- Selling carbon credits = \$21,000 (every 12 years)

Barry's Comparative Energy Savings

	2011	2012	2013	2014
Gallons Propane	81,353	27,240	33,158	37,337
Avg. Cost/Gal	\$1.25	\$1.25	\$1.40	\$1.91
Propane	\$101,691	\$34,050	\$46,421	\$71,314
Tons of Pellets	0	275	256	260
Pellets ** \$168/ton deliv.	\$0	\$40,975*	\$43,008	\$43,680
Total	\$101,691	\$75,025	\$89,429	\$114,994
Projected Cost based on BTU's used	\$101,691	\$94,603	\$109,555	\$158,792
Projected Savings	\$0	\$19,578	\$20,126	\$43,798

- *Multiple Suppliers with differing prices
- **Pellets at \$168 per ton = Propane @ \$.885 per gallon

On Site Storage



Pellet Delivery System



Burner and Boiler



Firebox



Ash Collection / Stack

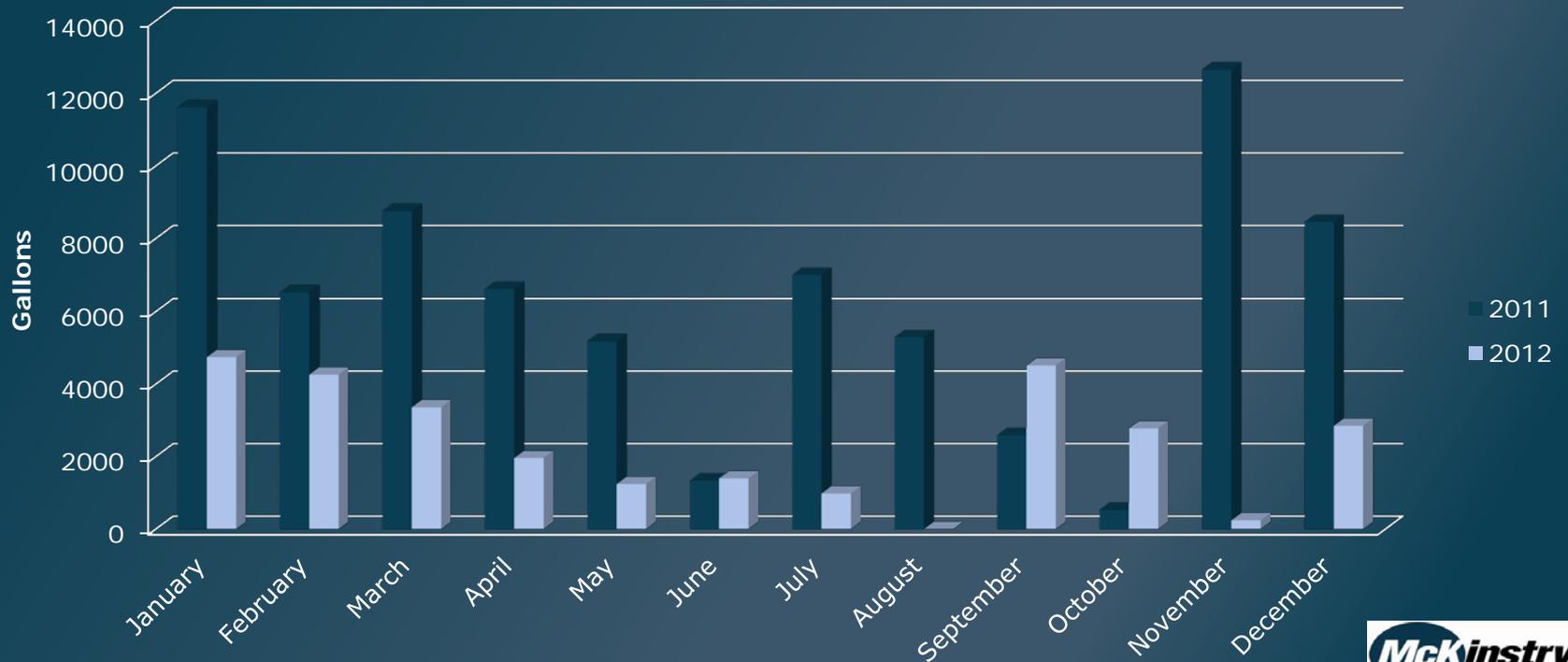


Servicing Ash Collection



CFVH Propane Use by Month

Clark Fork Valley Hospital Approximate Propane Use



Alternative to Propane



Strategic Direction

- CFVH
 - Transfer Domestic Hot Water to Biomass
 - Re-commission Building to identify Energy Savings
 - Utilize Biomass and Clean Energy solutions in outlying facilities



Additional information:

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Montana Wood Biomass Energy Assistance

➤ Grants

- Preliminary technical/economic feasibility assessments
- Engineering and design

➤ Biomass Resource Supply Assessments

➤ Guidance on financing options

➤ Tours of biomass energy installations

➤ DEQ/DOE Combined Heat and Power assistance

Contact

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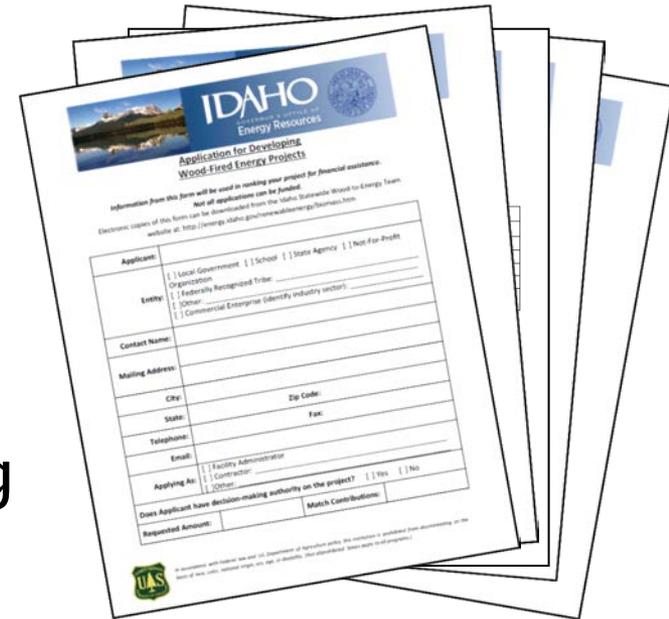
Website: <http://dnrc.mt.gov/forestry/assistance/biomass>





Idaho Project Development Grants

- ▶ Up to \$12,000 per approved application
- ▶ Engineering analysis for an existing facility retrofit or new project
- ▶ Grants cannot be used for construction or equipment



Contact:
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Additional Resources



Community Biomass Handbook eBook

<http://woodenergy.umn.edu/communityBiomassHandbook.html>

Wood Energy Financial App <http://woodenergy.umn.edu/BiomassCalculator/>

Wood Heat Solutions: A Community Guide to Biomass Thermal Projects

www.solageninc.com/articles/biomass_lowres.pdf

Wood2Energy Facility Database www.wood2energy.org

Biomass Energy Resource Center www.biomasscenter.org/

Biomass Thermal Energy Council www.biomassthermal.org/

Hospital CHP Guide: Powering the Future of Healthcare

Question and Answer Session

Ask questions—open audio

Speakers:

- Denyse Traeder, Frontier Medicine Better Health Partnership
- Julie Kies, Montana DNRC
- Barry Fowler, Clark Fork Valley Hospital
- Jason Williams, Clark Fork Valley Hospital
- Matt Wiggs, Idaho Office of Energy Resources

The webinar slides and recording will be made available after today.



Thank you for attending today's webinar.

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