

Selecting Successful Biomass Projects



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Successful Projects

➤ Common Traits of Successful Projects

- A committed owner
- Energy Cost Savings



Identify Owner's Goals

- Energy Savings
- Environmental
- Fuel Diversity
- Demonstration
- Economic Development



Drop Dead Issues



- Economic
 - Potential energy savings
 - Project cost
 - financing
- Interconnection
 - Central heating system?
 - Distributed heating system?
- Siting
 - Access for fuel delivery
 - Location of biomass system
- Biomass fuel supply
 - Infrastructure

Economics

- Potential Energy Savings
 - Capital Cost of the Project
 - Financial expectations of the owner
 - Public/Non-Profit looking for positive cash flow
 - Business looking for simple payback of 7 years or less
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Energy Savings

- More expensive fossil fuel = greater savings
 - Fuel oil
 - Propane
 - Electric
- Larger loads = greater savings
 - District heating systems
 - Year round loads
- Cost of biomass fuel
 - Opportunity fuel
 - Local market



Relative Fuel Value

	¹ Wood Chips	Wood Pellets	Natural Gas	Fuel Oil	Propane	Electricity
Cost per unit	\$40/ton	\$180/ton	\$8/mcf	\$3.50/gal	\$2.50/gal	\$0.10/kWh
² Btu/unit, HHV	10,500,000	16,400,000	1,025,000	138,800	91,300	3,412
Thermal Efficiency	70%	83%	80%	83%	79%	100%
\$/mmBtu, output	\$5.44	\$13.24	\$9.76	\$30.38	\$34.66	\$29.31

¹40% moisture wood chips

²LHV based on flue gas temperatures of 150° C which assumes latent heat of water evaporation not recovered

Controlling Project Costs

- Overall project scope
- Right sizing the boiler
 - Not only boiler affected by size selection
 - Pumps
 - Pipes
 - Building and storage size
 - Permits
 - Operating costs
- Type and location of building
- Financial assistance

Environmental Goals

- American College and University Presidents Climate Commitment
- Corporate Environmental Sustainability Policies
- Avoiding permitting compliance costs



Fuel Diversity

- Permit operating restrictions
- Hedge against volatile fossil fuel prices
- Fuel use restrictions
 - Better pricing
 - Limited availability



Pitfalls

- Project Creep
 - Selecting the right type of installation
 - Financing
 - Selecting design team
 - Fuel supply
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Selecting the Right Type of Installation

- Setting
 - Institutional
 - Industrial
- Owner's personnel
 - Level of automation





Financing

- Grants
 - Long lead times
 - May add to project costs
 - Limit equipment sourcing
 - Reporting and documentation
- Financial strength of owner

Selecting the Design Team



Pharmaceutical manufacturer

- Energy Savings and Corporate sustainability
- 575,000 gallons of fuel oil annually
- 12,000 lb/hr steam biomass system
- 275 kW electric generation
- \$1.2 million in annual savings
- \$5.0 million project



University

- Fuel diversification/
environmental compliance
and energy savings
- Offsets 90% of 7,000 tons
of coal and 150,000 mcf
NG
- 42,000 lb/hr steam
biomass boiler
- \$1.0 million in annual
savings
- \$8.1 million project



County Complex (prison and nursing home)

- Energy Savings
- 250,000 gallons of fuel oil
annually
- 220 HP biomass boiler
- \$300,000 in annual
savings
- \$3.2 million project
 - \$2.0 million grant



Hospital Complex

- Corporate sustainability goals and energy savings/
- Offsets 157,000 mcf NG
- 440 kW electric generation
- 27 mmBtu Biomass system
- \$470,000 in annual savings
- \$5.9 million project



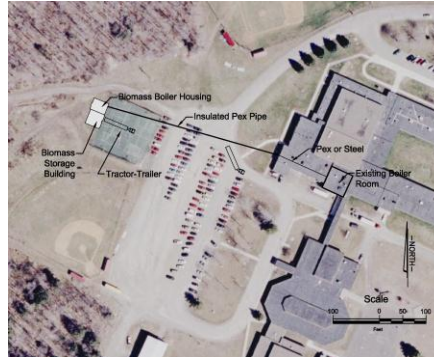
School and Community Complex

- 32,000 mcf of NG annually
- 190 kW electric Generation
- \$200,000 in annual savings
- \$3.5 million project
 - \$940,000 grants
 - \$600,000 avoided costs



High School

- 45,000 gallons of fuel oil offset
- \$100,000 in annual savings
- \$1.5 million project
 - \$1.1 million in grants



Conclusions

- Successful projects Require
 - A committed owner
 - Must make economic sense
 - Environmental factors can help drive projects
 - Fuel diversity can be important
 - Grant dollars can drive projects for demonstration or to create markets



Questions

