

The **Wood Energy Financial App** is an interactive calculator that rapidly estimates capital investment costs, biomass usage, annual fuel cost savings, and a projected payback for wood chip and wood pellet energy systems in comparison to fossil fuel energy systems. The App and companion Community Biomass Handbook facilitate early screening of potential wood energy systems of various sizes.

The App predicts the financial return of a wood energy system based on selected fuels, capital costs of known wood energy installations in the U.S., and other project variables. The App is suitable for business owners, consultants, facility operators, economic development organizations, and others considering wood energy.

Wood Energy Financial App Annual Fuel Cost Savings: **\$86,100**

Energy Costs | Capital Costs | Cash Flow

Existing Heating System

- Fuel Type: Propane
- Cost per Gallon: \$1.85
- Cost per MMBtu: \$20.26
- MMBtu per Gallon: 0.09130
- Annual Fuel Usage:
 - MMBtu per Year: 5,935
 - Gallons per Year: 65,000
 - Annual Propane Cost: \$120,250
- Existing Boiler:
 - Boiler Type: Conventional
 - Efficiency (%): 80%
- Annual Heat Demand:
 - Delivered Heat (MMBtu): 4,700
 - Substitution Percentage: 90%

Biomass Heating System

- Biomass System: Chips
- Efficiency (%): 86%
- Biomass Fuel:
 - Moisture Content (wet): 50%
 - Cost per MMBtu: \$4.45
 - Cost per Green Ton: \$30
 - Cost per Dry Ton: \$60
- Biomass Annual Fuel Usage:
 - Green Tons: 737
 - Dry Tons: 369
 - Truck Loads (25-ton loads): 30
 - Biomass Fuel Cost: \$22,000
- Remaining Annual Fuel:
 - Remaining Propane Cost: \$12,000

Cost per Gallon: \$1.85

Capital Costs →

- Identify the size of boiler needed for your proposed heat load.
- Calculate the total capital cost of your system including the boiler, fuel handling and storage, site and building, engineering, and related costs.
- Assess the viability of a district heating system including pipe trenching and installation, building hookup costs, and related.

← Energy Costs

- Quickly compare the fuel cost savings of a wood pellet or chip system to your current fossil fuel system.
- Examine the impact of wood moisture content on delivered fuel cost and energy output.
- Determine the amount of biomass necessary to source your proposed wood energy system.

Wood Energy Financial App Total Capital Cost: **\$768,000**

Energy Costs | Capital Costs | Cash Flow

Biomass System Cost and Size Estimates

- Biomass Boiler Size Estimate:
 - MMBtu per Year (biomass): 4,968
 - Utilization (Months/Year): 7.0
 - Utilization (percent): 58%
 - System Size (MMBtu/hr): 1.0
- Use Model-Driven Estimate
- Biomass Boiler Cost:
 - Boiler System Costs: \$768,000
 - Building & Site Costs: \$0
 - Total Boiler & Building Cost: \$768,000

Distribution Costs

- Hookups:
 - Building Hookup Costs: \$0
 - Number of Buildings: 0
 - Home Hookup Costs: \$0
 - Number of Homes: 0
- Piping:
 - Pipe Cost per Linear Foot: \$0
 - Pipe Distance: 0
- Total Distribution Costs:
 - Total Distribution Costs: \$0

Utilization (Months/Year): 7.0

← Cash Flow

- Make a preliminary judgment about the financial viability of your project. Alter the project inputs and re-run the analysis as needed.
- Determine the sensitivity of cash flow to interest rates, outside grants, cost of fuel, and other variables affecting projected payback.

Disclaimer:

The App is designed only for early project scoping and should never replace a more formal site specific pre-feasibility assessment.

Wood Energy Financial App Payback Period (years): **16.8 Years**

Energy Costs | Capital Costs | Cash Flow

Financial Inputs

- Financial Parameters:
 - Total System Costs: \$768,000
 - Interest Rate: 3.0%
 - Project Lifespan: 25
 - Outside Grants: \$75,000
- Operations & Maintenance Cost:
 - O&M Costs: \$5,000
 - O&M % of System Cost: 1%
- Cost Scenarios:
 - Biomass Cost (Green Ton): \$30.00
 - Propane Cost per Gallon: \$1.85

Financial Results

- Financial Results:
 - Financed System Cost: \$693,000
- Biomass System Annual Expenses:
 - Biomass Fuel Cost: \$22,000
 - Remaining Fuel Cost: \$12,000
 - O&M Cost: \$5,000
 - Debt Payment: \$39,800
 - Total Expenses: \$79,000
- Existing System Annual Expenses:
 - Annual Propane Cost: \$120,000
- Value of Adding Biomass System:
 - Annual Net Cash Flow: \$41,000
 - Present Value of Cash Flow: \$720,000
 - System Cost per MMBtu: \$16.62

Outside Grants: \$75,000