Wood Heat Pre-Feasibility Studies

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Biomass Energy Resource Center (BERC)

Advancing Community-scale Biomass Energy in North America

Technical Consulting

- Project feasibility studies
- Fuel supply assessments and procurement
- Third-party expert review
- Develop and review of standards
- Market Assessments

Program Design & Implementation

- Expansion potential assessments
- Program management
- Training, and advisory support services

Advocacy

- Showcasing “best practices” and case studies of successful projects
- Tracking market growth and impacts

BERC is a program of the Vermont Energy Investment Corporation
A mission-driven non-for-profit whose mission is to reduce the economic and environmental impacts of energy production and consumption

What is a Pre-Feasibility Study?

Assess if wood heat is a good fit for a facility:

- **Technical/ Logistical feasibility:**
  - **Fuel type**
  - **Boiler plant location: shoehorn, separate building, mini-district heat**
  - **Fuel delivery feasibility**
- **Economic feasibility**-An estimate of the range of costs and savings over time, conceptually

- Suggestions on next steps, available grants, funding opportunities
- Professional expertise in selecting proper inputs for calculations

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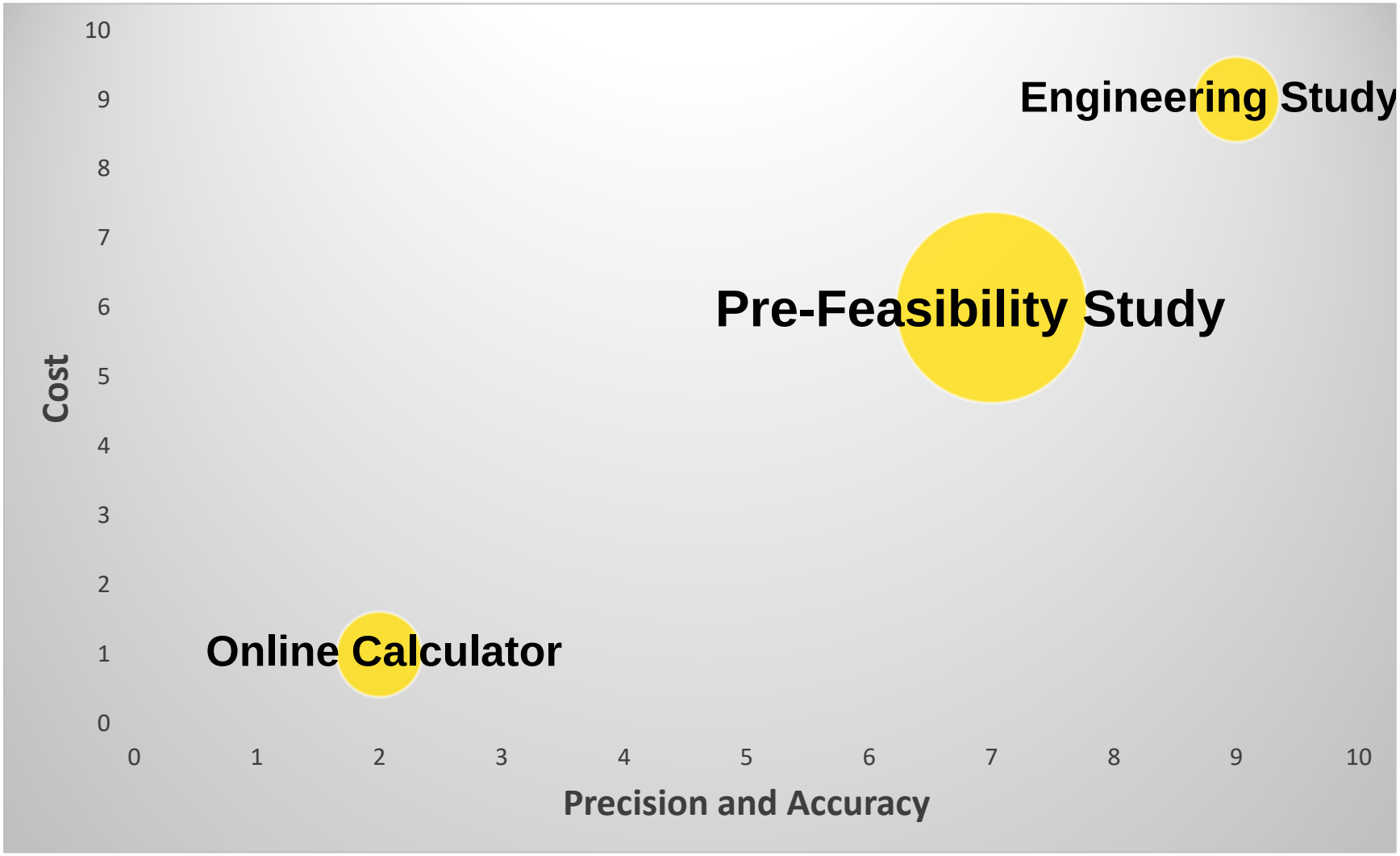
What is a Pre-Feasibility Study?

Study Precision and Accuracy vs. Cost



Value of Pre-Feasibility Studies

For Facility Manager:

- **Third-party, trusted, objective** information for potential wood heat users
- If results of the economic analysis are unfavorable, at **what point do they become more favorable**
- **Overcomes the information gap barrier** between potential user and sales rep

For Program Managers:

- Offers the flexibility **streamline analyses for a similar group of facilities or a specific State-sponsored program.**
- **Consistency of analysis** across multiple facilities, as long as using the same model

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What Informs a Pre-Feasibility Study?

Site visit to assess technical/logistical feasibility

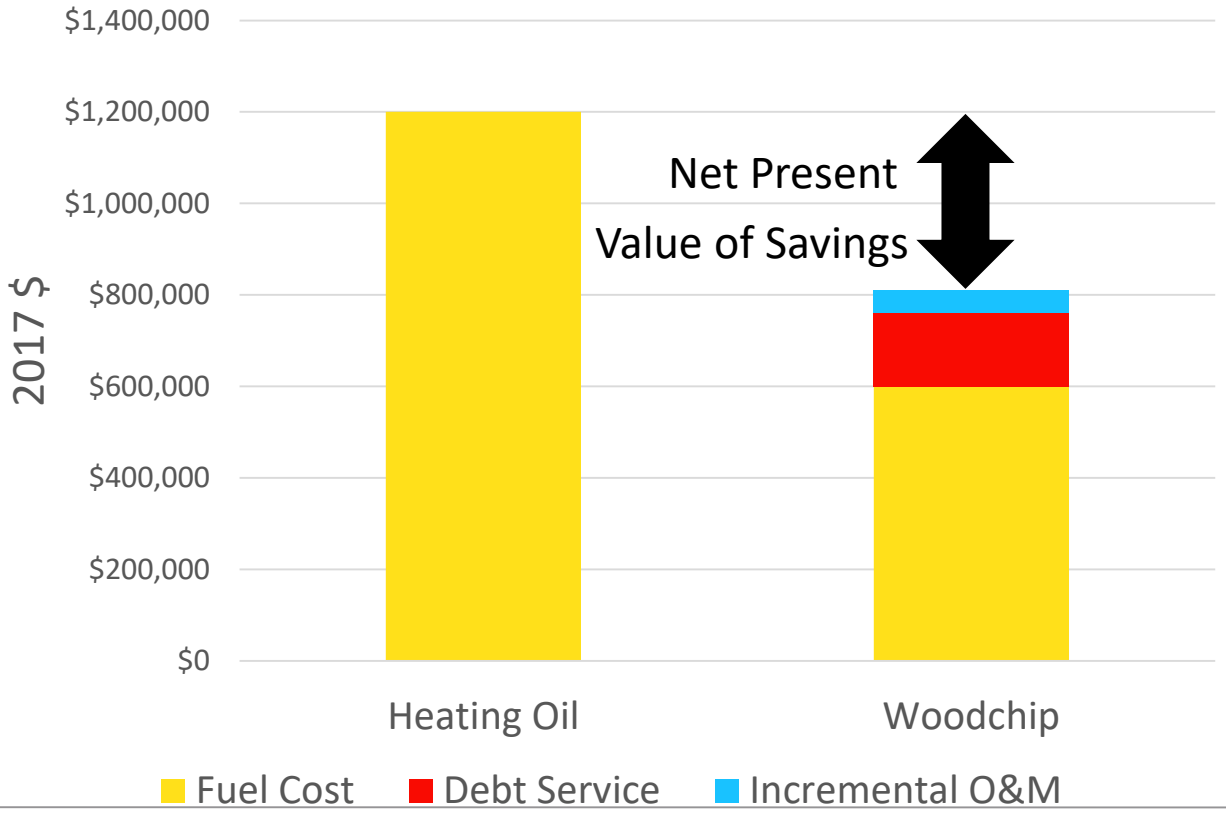
High level review and analysis of

- Recent annual fuel use and cost
- Current heating and hot water loads

Parameter	Assumptions
Annual consumption of heating oil (gallons)	6,054
Year 1 Price of Heating Oil (per gallon)	$2.73
Heating oil price escalation rate over general inflation	1.50%
% of peak demand covered by pellets system	50%
% of annual heating covered by pellets system	90%
Annual Bulk Pellets required (tons)	45
Year 1 price of bulk pellets (per ton)	$250
Bulk pellets price escalation rate	At general inflation
Percent of capital cost covered by grant	43%
Percent of project cost financed	57%
Term of financing (years)	20
Interest rate	4.0%

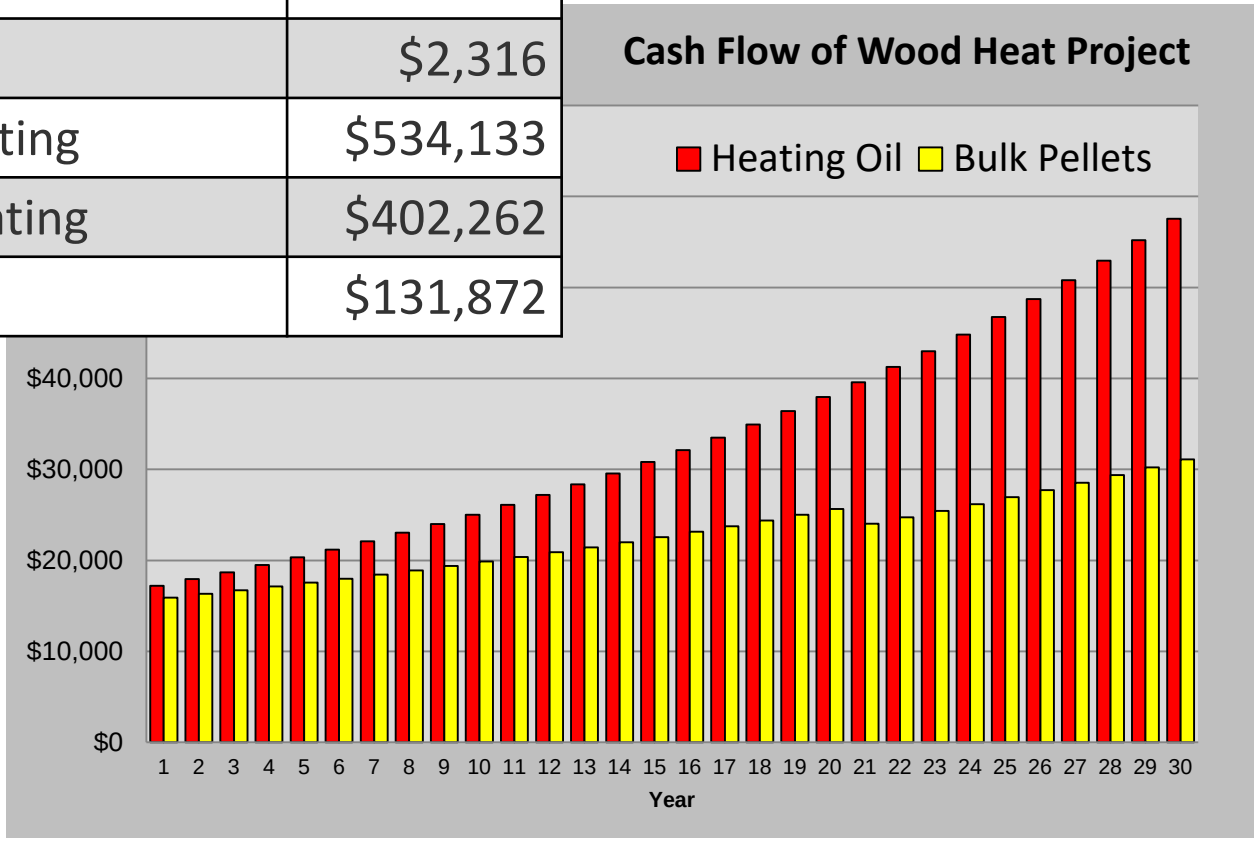
Key Outputs from a Typical Pre-Feasibility Study

- Economic analysis:
  - Simple payback,
  - First year fuel savings
  - Cash flow
  - Life Cycle Cost Analysis - Net Present Value of Savings:

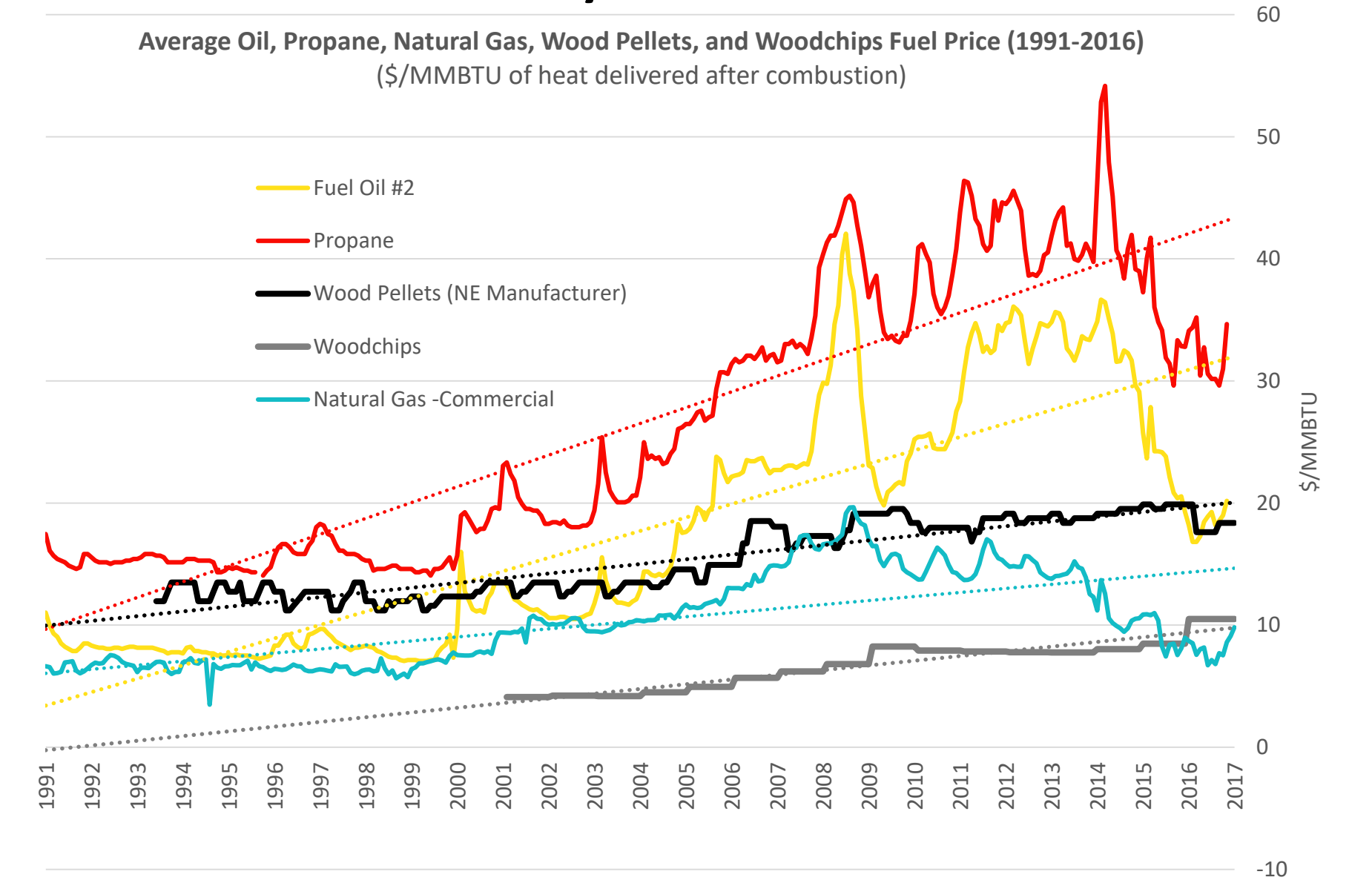


Key Outputs from a Typical Pre-Feasibility Study

Economic performance indicator	Result
First year fuel savings	$3,818
Simple payback (years)	8.34
Annual debt service	$2,316
30YR NPV Heating Oil heating	$534,133
30YR NPV Bulk Pellets heating	$402,262
30YR NPV of Savings	$131,872



Fossil Fuel Price Volatility



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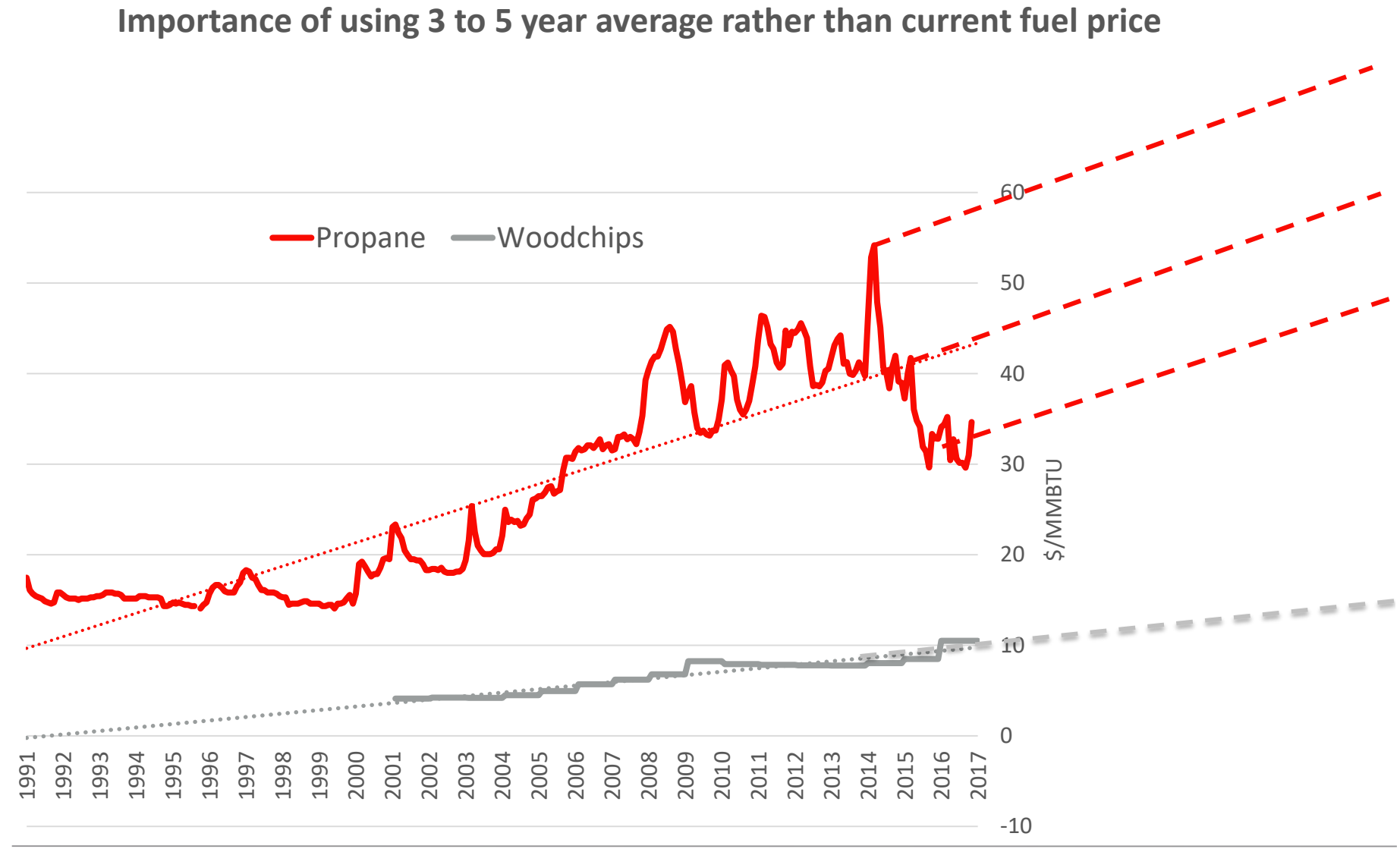

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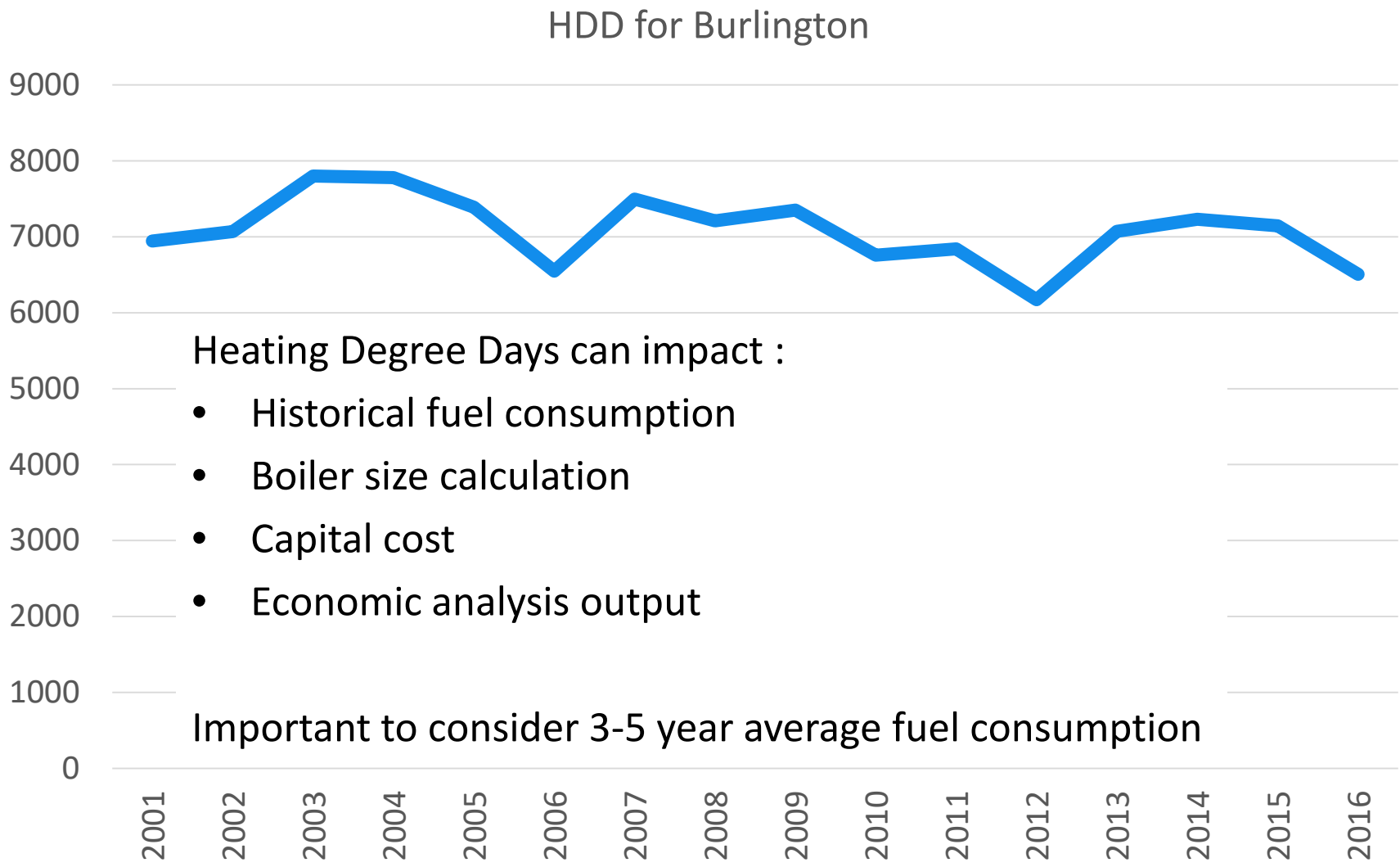
Fuel Consumption Variability



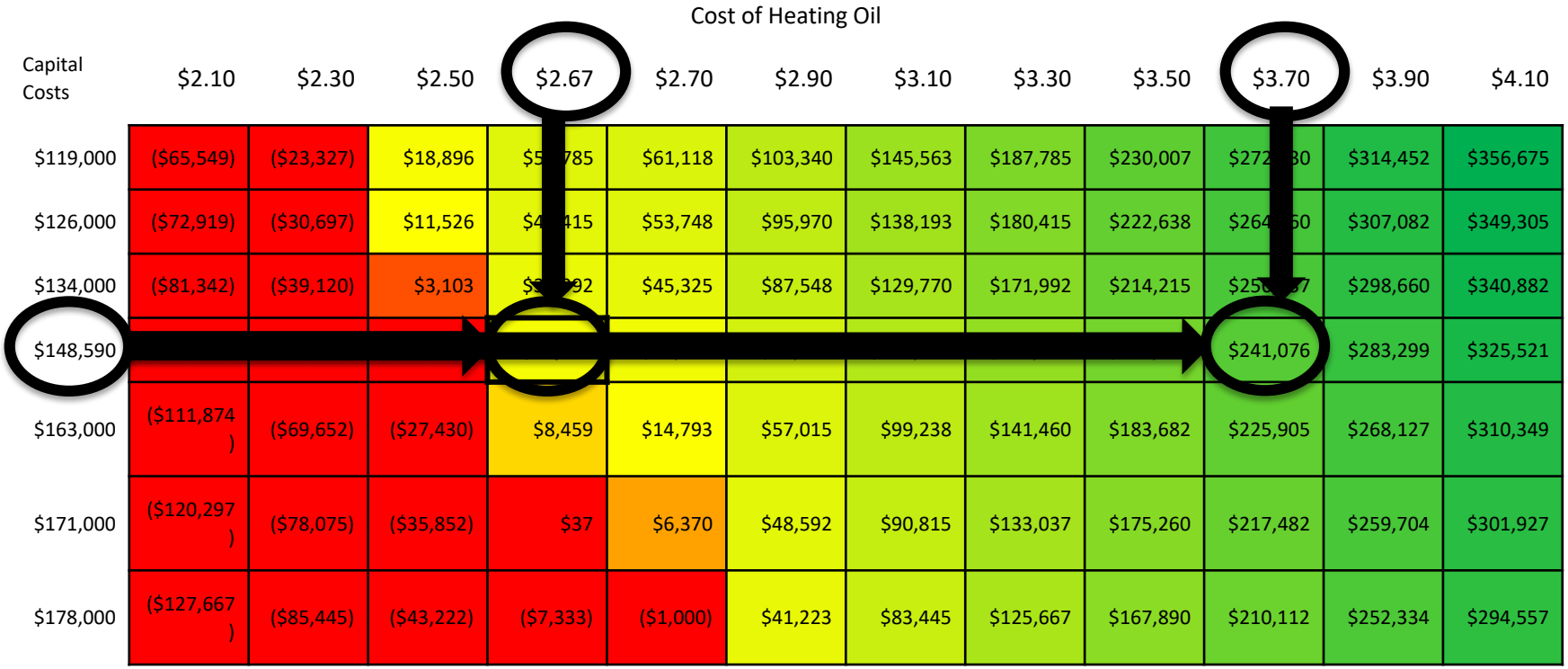
Heating Degree Days can impact :

- Historical fuel consumption
- Boiler size calculation
- Capital cost
- Economic analysis output

Important to consider 3-5 year average fuel consumption

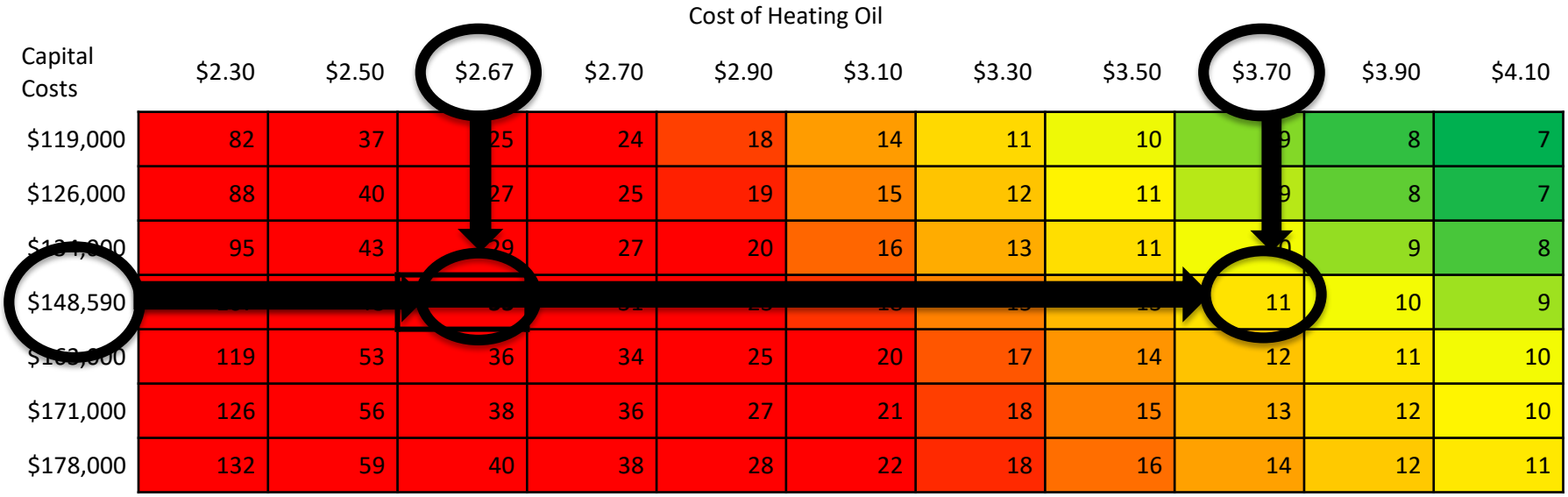
Key Variables in a Pre-Feasibility Study

Net Present Value of Savings over 30 Years



Key Variables in a Pre-Feasibility Study

Simple Payback from 30 Year Life Cycle Cost Analysis



Adding Value to Positive Externalities

Cost effectiveness at the facility level should not be the only decisive factor

Benefits of wood heat should be considered:

- **Support local economy**: forestry, fuel processing and delivery
- **Market for low-grade wood**
- **Price stability of wood** vs. volatility of fossil fuels

Environmental Benefits:

- Renewable Energy Credits- RECs (NH only; large facilities only)
- Carbon Saved

Summary- Value of Pre-feasibility Studies

- Provides **objective information** for facility managers to **make decisions** based on economic factors
- Highlights **benefits beyond the pure economic** analysis
- **Offers flexibility to streamline** analyses for a similar group of facilities or a specific State-sponsored program

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