Community
Roadmap
to Renewable
Woody Biomass Energy

A Step-by Step Decision-Making Tool for New Hampshire Communities

Agenda:

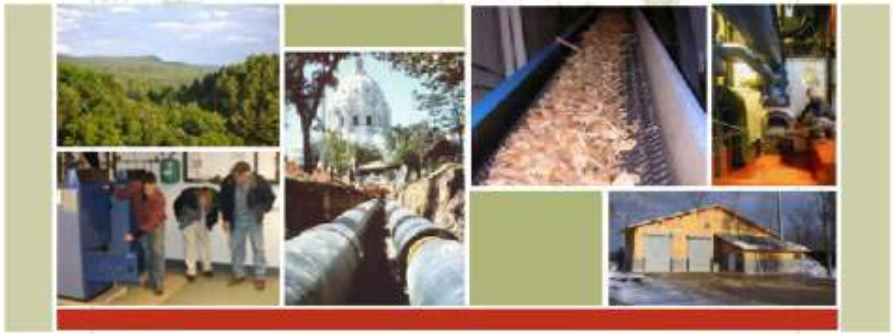
- *Why a Roadmap?*
- *What is the Roadmap?*
- *How to use the Roadmap*

The Roadmap is a decision-making tool to help communities decide if woody biomass heating/cooling is a good choice for their energy future.

The Roadmap is a detailed plan

- ✓ ***Community gathers information***
- ✓ ***Community evaluates information***
- ✓ ***Community makes decisions***

Community Roadmap to Renewable Woody Biomass Energy



A STEP-BY-STEP DECISION-MAKING TOOL
FOR NEW HAMPSHIRE COMMUNITIES

Contents

Community District Energy:

The use of a central heating plant to provide heat or combined heat and power (CHP) to multiple buildings using buried pipes to distribute the energy.

The

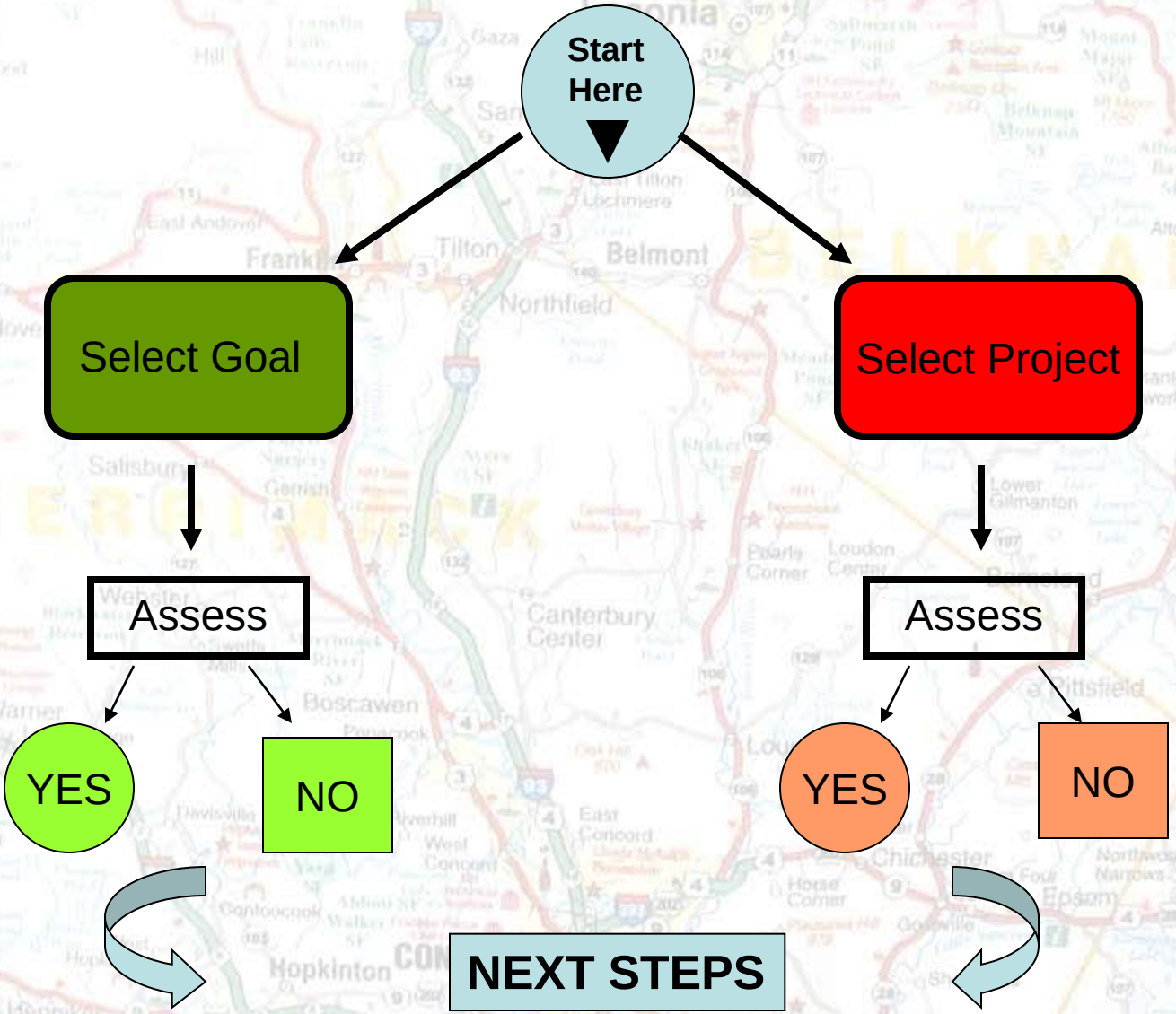
Roadmap

has two main components:

1. ***Establish community goals***
2. ***Evaluate a biomass project***

Community Engagement

Roadmap Decision Tree



Community Engagement

- *Makes good use of local expertise*
- *Allows people to gain new information*
- *Allows leaders to gauge community interest*
- *Result is better, well-informed decision-making*

Community Energy goals

May include the following:

- *We Have Lower Energy Costs*
- *We Are Energy Independent*
- *Our Energy is Reliable*
- *We Emit Less Carbon*
- *We Rely on Renewable Energy Resources*
- *We Are Energy Efficient*
- *We Have a Strong Local Economy*

- ▶ We Have Lower Energy Costs
- ▶ We Are Energy Independent
- ▶ Our Energy Is Reliable
- ▶ We Emit Less Carbon
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▶ COMMUNITY GOAL 1

G1. We Have Lower Energy Costs

DEFINITION: **We spend less on energy and our energy spending is relatively stable.**

Introduction

Once capital investments are made, biomass fuels used for heating are significantly less expensive than fossil fuels on a cost/Btu basis. Fuel savings cover the cost of capital investments over some period of time. Long-term contracts for biomass can provide stable pricing with little impact from global economic and political events. The price of biomass fuels in the New England area has remained very stable in the last 20 years and is likely to fluctuate much less than the fossil fuel prices.

While biomass fuel pricing tends to be more stable than fossil fuels, the market does still fluctuate. The best way to predict the cost of your biomass fuel is to contact local providers (**go to ▶ Section P6. Biomass Fuel**). In New Hampshire, the average price for biomass in 2009-2010 was approximately $55 per ton of delivered wood-chips and $250 per ton of delivered pellets (this is bulk delivery of pellets by truck to silo, bagged pellets are more). You should confirm prices in your area before completing this section. **Go to ▶ Section P6. Biomass Fuel.**

If you do not know which building(s) to assess for biomass heat, **go to ▶ Section P1a. Selecting a Project.**

IN THIS SECTION

G1a. Existing Fuel Costs

Complete the following table to determine the existing fuel costs for each building being evaluated for a biomass heating system:

Instructions: Existing Fuel Costs

COLUMN 1: List each building that will be affected by the biomass project.

COLUMN 2: List the type of fuel(s) currently being used to heat each building. (For more detailed information on collecting fuel use/cost data, **go to ▶ P3. Existing Fuel Use**).

COLUMN 3: Identify how much of each type of fuel you are using per year. Check if the fuel used for heating includes fuel for domestic hot water (DHW). If the fuel used for heating does not include DHW, get the estimated consumption of fuel for DHW from the building owner/maintenance staff and add it to your Current Annual Usage. If no estimates are available add 11% of the fuel consumption for space heating for DHW. Annual Usage for Heat _____ x 11% = DHW. (Add this to Current Annual Usage for heat) in column 3.

COLUMN 4: Identify how much you are paying (per gallon, kWh, etc.) for each type of fuel.

COLUMN 5: Multiply column 3 by column 4 to determine the average annual cost of each type of fuel.

COLUMN 6: Multiply current annual usage (column 3) by 15% (see Appendix A for an explanation of this number) to identify how much of your existing fuel sources you will be using after the biomass energy system has been installed.

COLUMN 7: Multiply column 6 by column 4 to determine the average annual cost of non-biomass fuel you will need with the proposed biomass system.

G1a. EXISTING FUEL COSTS

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4	COLUMN 5	COLUMN 6	COLUMN 7
Building	Type of Fuel	Current Annual Usage	Current Average Price	Average Annual Cost	Average Usage with Biomass System	Average Annual Cost with Biomass System

***G1a EXAMPLE.* EXISTING FUEL COSTS**

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4	COLUMN 5	COLUMN 6	COLUMN 7
Building	Type of Fuel	Current Annual Usage	Current Average Price	Average Annual Cost	Average Usage with Biomass System	Average Annual Cost with Biomass System
School	*Fuel Oil*	*100,000 gallons*	*$2.50*	*$250,000*	*15,000 gallons*	*$37,500*
Town Hall	*Propane*	*8,000 gallons*	*$2.00*	*$16,000*	*1,200 gallons*	*$2,400*

G1f. Summary

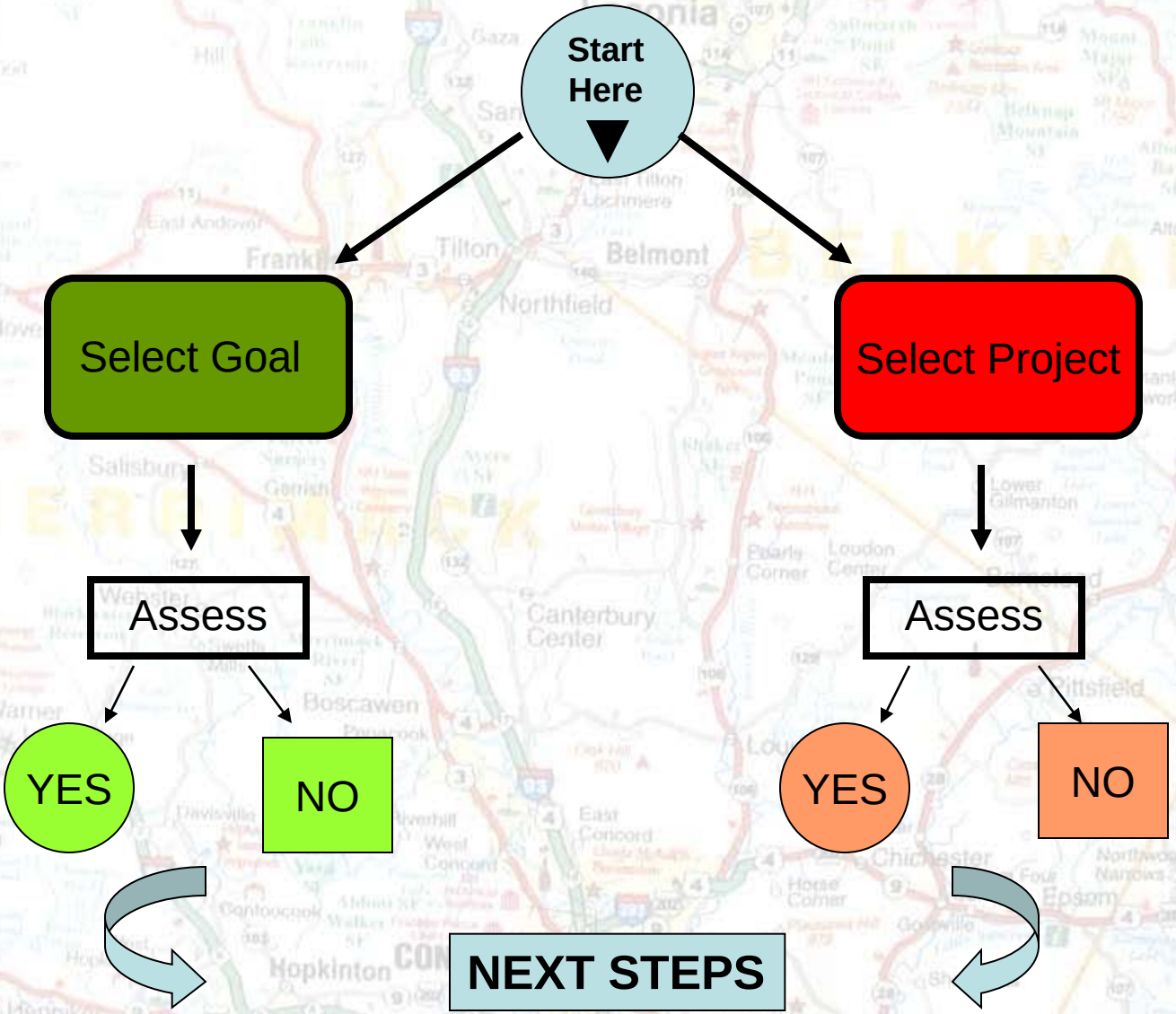
Complete the summary table below with information from preceding tables in section G1. (Columns with the shaded background in preceding tables show which information should be transferred to the summary table.)

G1f. LOWER ENERGY COSTS SUMMARY

Building	Current Annual Fuel Costs	Estimated Annual Fuel Costs with Biomass	Estimated Annual Fuel Savings with Biomass	Pay-Back Period	Price Stability (G1e)

The cost of wood-chips used for heating fuel tends to increase more slowly and has historically been much more stable in price over the past two decades than fossil fuels.

Roadmap Decision Tree



Biomass Project Evaluation

- *Project Characteristics*
- *Building Information*
- *Existing Fuel Use*
- *Existing Heat & Distribution System*
- *Biomass Energy System*
- *Biomass Fuel*
- *Emissions, Permitting & Air Quality*

- ► Project Characteristics
- ► Building Information
- ► Existing Fuel Use
- ► Existing Heating and Distribution System
- ► Biomass Energy System
- ► Biomass Fuel
- ► Emissions, Permitting, and Air Quality

► EVALUATE A BIOMASS PROJECT 1

P1. Project Characteristics

Biomass energy systems can be used at multiple scales and in multiple types of projects. The *Roadmap* will help communities understand the characteristics of biomass energy systems for a single building, multiple buildings with individual biomass boilers, and district heat systems (one heating plant for multiple buildings).

NOTE: **Combined heat and power (CHP) projects are found to be not as cost effective as the heating only projects with the present policy and incentives framework. It is recommended that the community should consider heating projects initially. The Roadmap does not analyze CHP projects. If the community continues to be interested in a CHP system, this can be evaluated in the pre-feasibility study (see ► Next Steps). For more information on CHP, see ► Appendix B Combined Heat and Power.**

IN THIS SECTION

Next Steps

Following completion of the *Roadmap*, if you determine that your community has a biomass project that is likely to be viable and wish to move toward implementation, a range of public outreach and education, community capacity, technical work, financing, and logistical issues will need to be addressed. In this section, these major categories of implementation are outlined. Communities will need internal capacity and staffing and one or more development partners to move forward effectively.

IN THIS SECTION

Community **Roadmap**

At the end of the journey, a community will have a pretty good idea of whether it makes sense to pursue one or more biomass projects.