

Our
Energy...
Our
Future...
11-20-08



What is Biomass



- Forest biomass can include not only trees of any size, along with their branches and foliage, but also standing and fallen dead trees, woody shrubs, herbaceous plants and even animals.
- The definition of biomass in current discussions in Nova Scotia may be restricted to living trees over 9.1 centimeters in diameter at breast height, including their branches and foliage. However, some include dead trees as part of a biomass harvest, as illustrated in a recent article (emphasis added):

What is Biomass con't...

- *The beauty of the idea [of biomass energy] is its ability to run on the ugly stuff; the bark, the lumber leftovers, the logs of dubious marketing quality, and even the dead trees in the forest. 'Why would New Brunswick want to bring in oil from Venezuela when we have 10 million tonnes of wood rotting in the forest every year?' asks George Jenkins, a research scientist at the Wood Science and Technology Centre with the University of New Brunswick.*
- Organic materials recently produced from plants, and animals that feed on the plants and as such biomass can be collected and converted into useful bioenergy. Other forms of biomass includes crop residues, forest and wood process residues, animal wastes including human sewage, municipal solid waste (MSW) (excluding plastics and non-organic components), food processing wastes, purpose grown energy crops and short rotation forests. (Ecology Action Centre)

Raw Material Available



- ***Annapolis and Digby Counties***

- ✦ Total Forested Land: 1,167,077 acres
- Annual Regeneration (assume 0.5 cord/acre/yr):
583,538 cords = maximum theoretical sustainable harvest
- Total 2006 Harvest: 329,465 cords
- Annual Theoretical Underutilization of Resource =
254,073 cords per year = 508,146 tonnes (green)
- 90% of this underutilization is occurring on small private woodlots (<2000 acres) and crown land
- Little mill residues available

Local Market



- Potential commercial and institutional customers
- Ultimate C and I local market (<200km) could be 20,000 tonnes per year
- Residential market for standard pellets not yet established
- New residential appliances for standard pellets will be on the market within 1 year.

Local Market cont.



- Over 1600 pellet stoves sold in NS in past 2 years – need premium pellets
- New whole home heating appliances will be CSA and ULC certified – approved by the insurance industry

Export Market



- Large well developed market in Europe
- US market growing but not yet importing much
- High transportation costs make for reduced margins on exported pellets – bottom price in Europe is too low to justify sales , need higher price and long term sales.

THE RISING COST OF #2 HEATING OIL

Year	Heating Oil Price per Litre	Escalation
Jan-00	0.499	--
Jan-01	0.587	18%
Jan-02	0.454	-23%
Jan-03	0.595	31%
Jan-04	0.547	-8%
Jan-05	0.682	25%
Jan-06	0.835	22%
Jan-07	0.819	-2%
Jan-08	0.999	22%
Average Escalation =		11%
Source:	www.mjervin.com	

• **In the last 8 years the price of heating oil has doubled.**

• **This results in an average escalation of 11% per year.**

PROJECTED COSTS OF #2 HEATING OIL

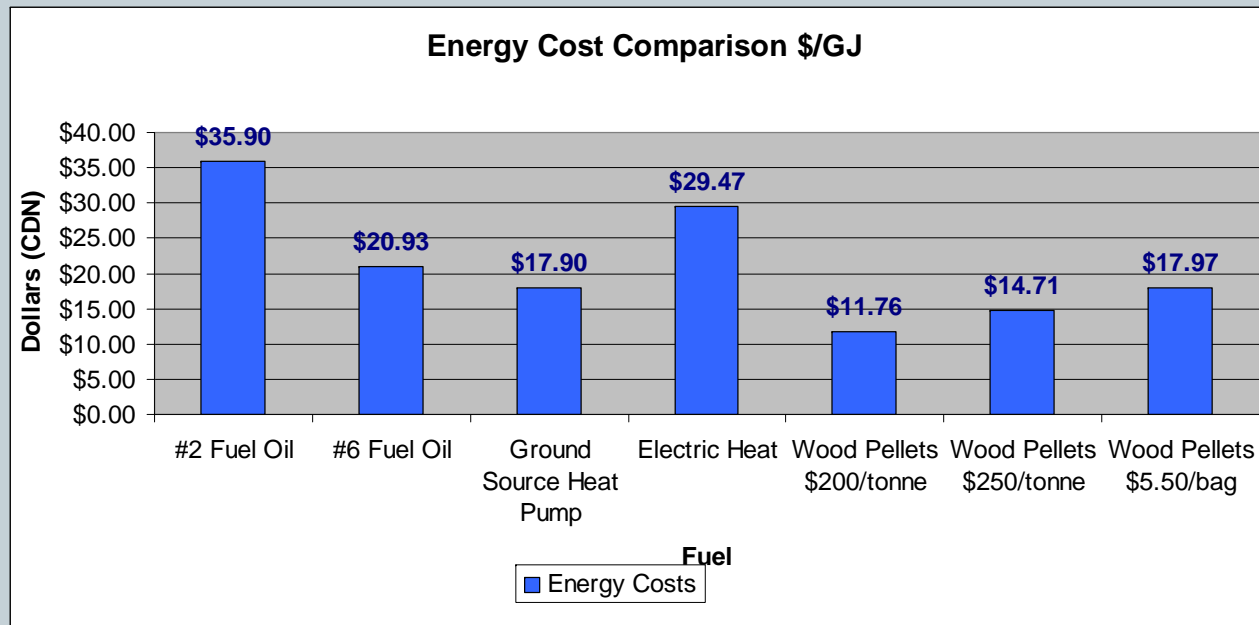
Year	Heating Oil Price per Litre	Escalation
Jan-09	1.109	11%
Jan-10	1.231	11%
Jan-11	1.366	11%
Jan-12	1.517	11%
Jan-13	1.684	11%
Jan-14	1.869	11%
Jan-15	2.074	11%
Jan-16	2.302	11%
Jan-17	2.556	11%
Jan-18	2.837	11%

• **If this escalation continues the price of heating oil will be \$2.84 per litre in 2018.**

• **This is an increase of more than 5 times the original price in 18 years.**

WOOD VS. OIL

- **Wood pellets are currently available in Nova Scotia for \$5.50 a bag or \$17.97 per gigajoule of energy.**
- **At \$1.10 per litre, heating oil is \$35.90 per gigajoule. On Sept 10th, 2008 heating oil was \$1.10 per litre in Halifax.**



5TPH Capital Cost Estimate

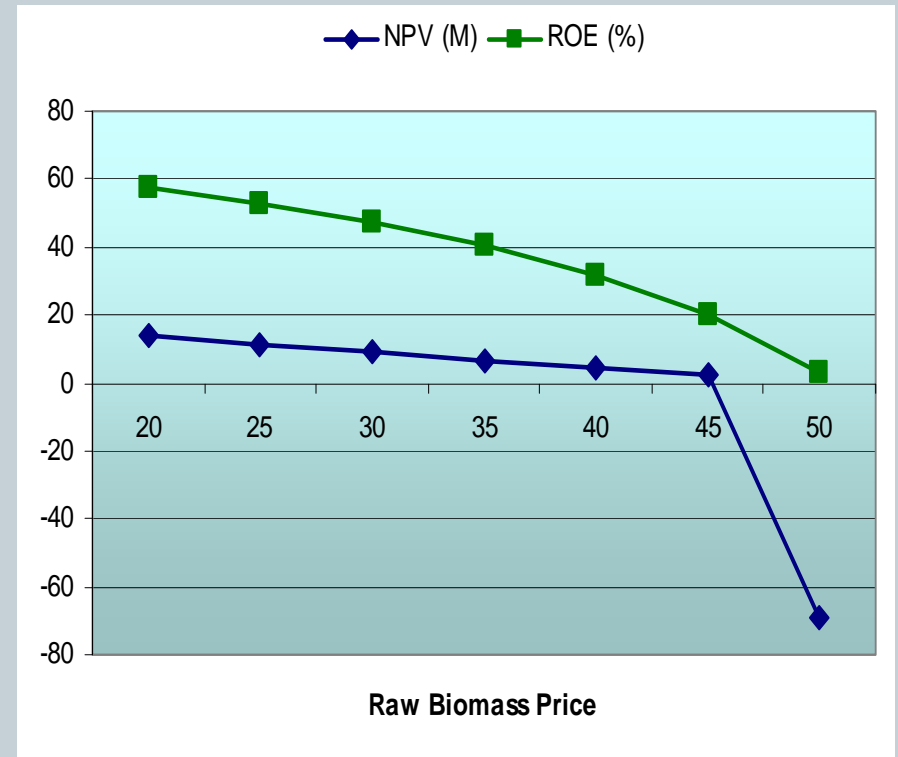
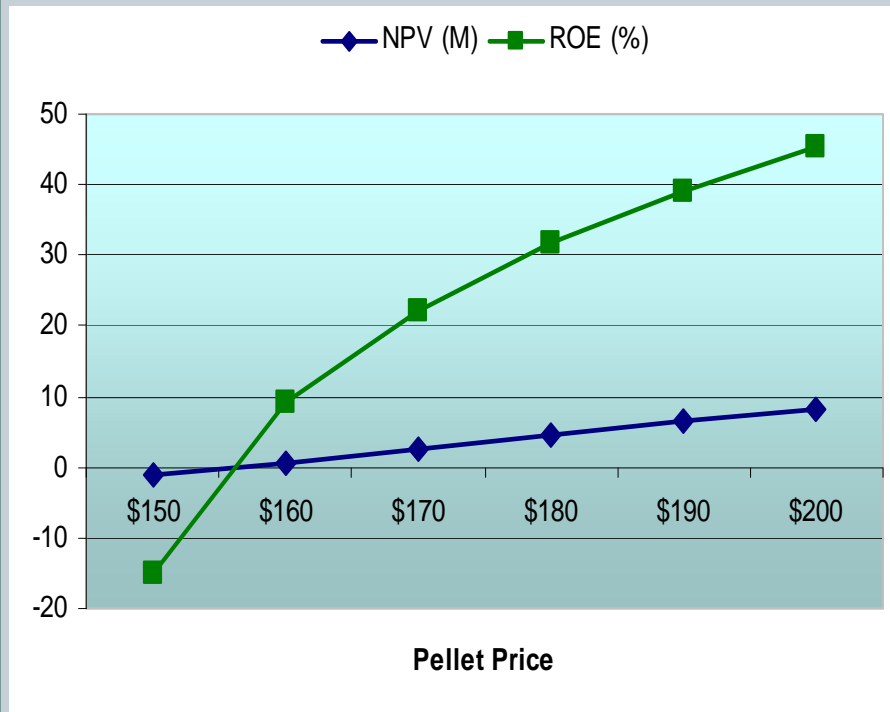
Crushing and Grinding System				\$178,000
Drying System				\$354,000
Pelletizing System				\$715,000
Belt Cooler System				\$196,000
Miscellaneous Systems				\$37,000
Mill Design, Commissioning, Training				\$28,000
Crusher Building (10mx10m)				\$159,000
Pelleting and Cooling Building(10mx30m)				\$475,000
Finished Pellet Storage and Loading (500 T)				\$250,000
Truck Scales				\$50,000
Site Lighting				\$25,000
*Land Purchase (2 acres)				\$50,000
Yard Prep and Paving				\$150,000
Yard Payloader				\$70,000
Equipment Shipping and Installation				\$650,000
Engineering and Project Management				\$100,000
Interest During Construction				\$100,000
Legal Costs				\$50,000
Market Development - Pre Production				\$50,000
Sub Total				\$3,687,000
Contingency (15%)				\$553,050
Total				\$4,240,050

Operating Costs for 30000TPY

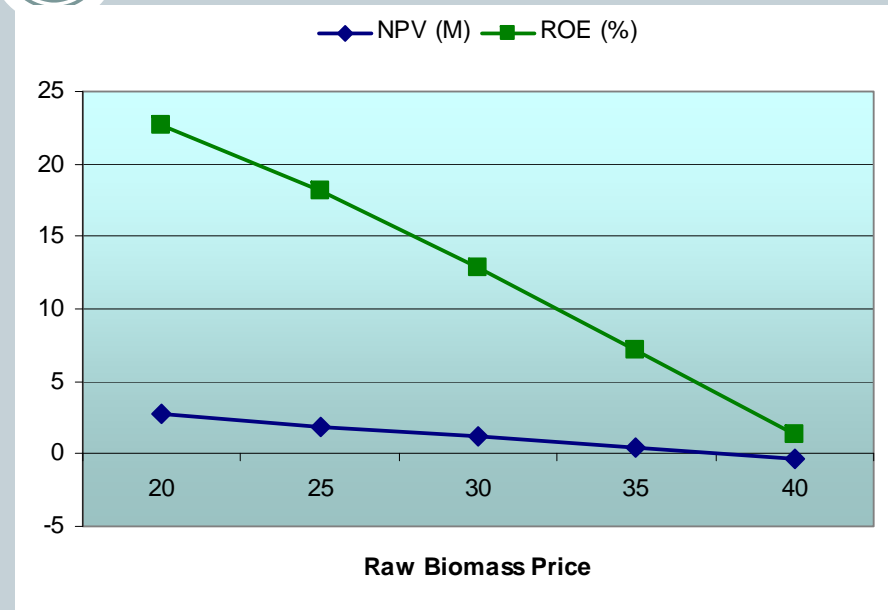
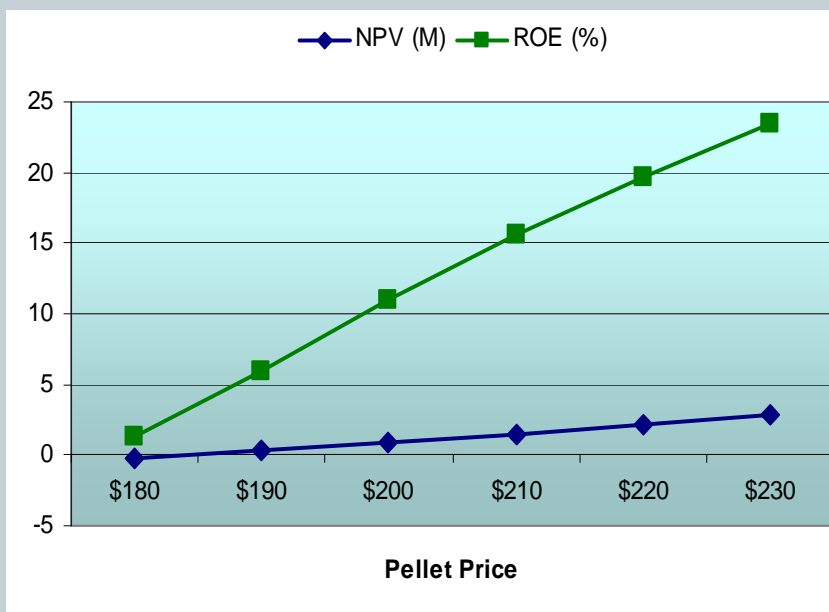


- Electricity Costs will be over \$550,000
- Personnel Costs for 22 staff - \$680,000
- Biomass Fuel - \$2,900,000
- Maintenance and Supplies - \$150,000
- Miscellaneous other - \$60,000
- Total cost is \$4.3M per year or \$140/tonne

30,000 Tonnes per Year Production Sensitivity Analysis



10,000 Tonnes per Year Production Sensitivity Analysis



TRANSPORT COSTS OF WOOD PELLETS

- **The cost of wood pellets also increases with the cost of oil due to the transportation of the pellets.**
- **For this plant , the maximum round trip delivery distance anticipated to deliver pellets to end users is 400 km**
- **In 2008 it costs \$26.40 to transport a ton of wood pellets over a round trip of 400 km.**





➤ **Situation In Annapolis / Digby**

- Local forestry industry is hurting
- Biomass as alternate energy presents opportunity
- Biomass as job creation strategy
- Biomass as part of community economic development
- Biomass as a way to reduce our carbon footprint



➤ **Next Steps**

- Confirm supply of biomass
- Seek investors either local or foreign
- Develop local market for biomass
- Develop demonstration project for district heat



➤ **Biomass Supply**

- Confirm supply of biomass – local woodlot owners
- Establish high level meeting with DNR for use of Crown Land to meet supply needs
- Meeting with woodlot owners on November 26th
- Introduce opportunity as both supplier & investor
- Introduce Co-operative model for investment
- Co-operation with Federation of NS Woodlot Owners



➤ **Seek Investors**

- Databases
 - Local Woodlot Owners
 - International & Domestic Pellet Manufacturers
 - Boiler Manufacturers
 - Contact with interested investors
 - Local Businesses/Sophisticated Investors
- Contact Marketing Firm (10,000)
- Work with NSBI, ACOA, NSED, Trade Dev
- Work with international consulates/DFAIT



➤ **Development of domestic markets**

- **Databases**
 - **Local Schools**
 - **NSCC**
 - **Municipal Buildings**
 - **Hospitals**
 - **Businesses**



➤ **Demonstration for District Heat System DHS**

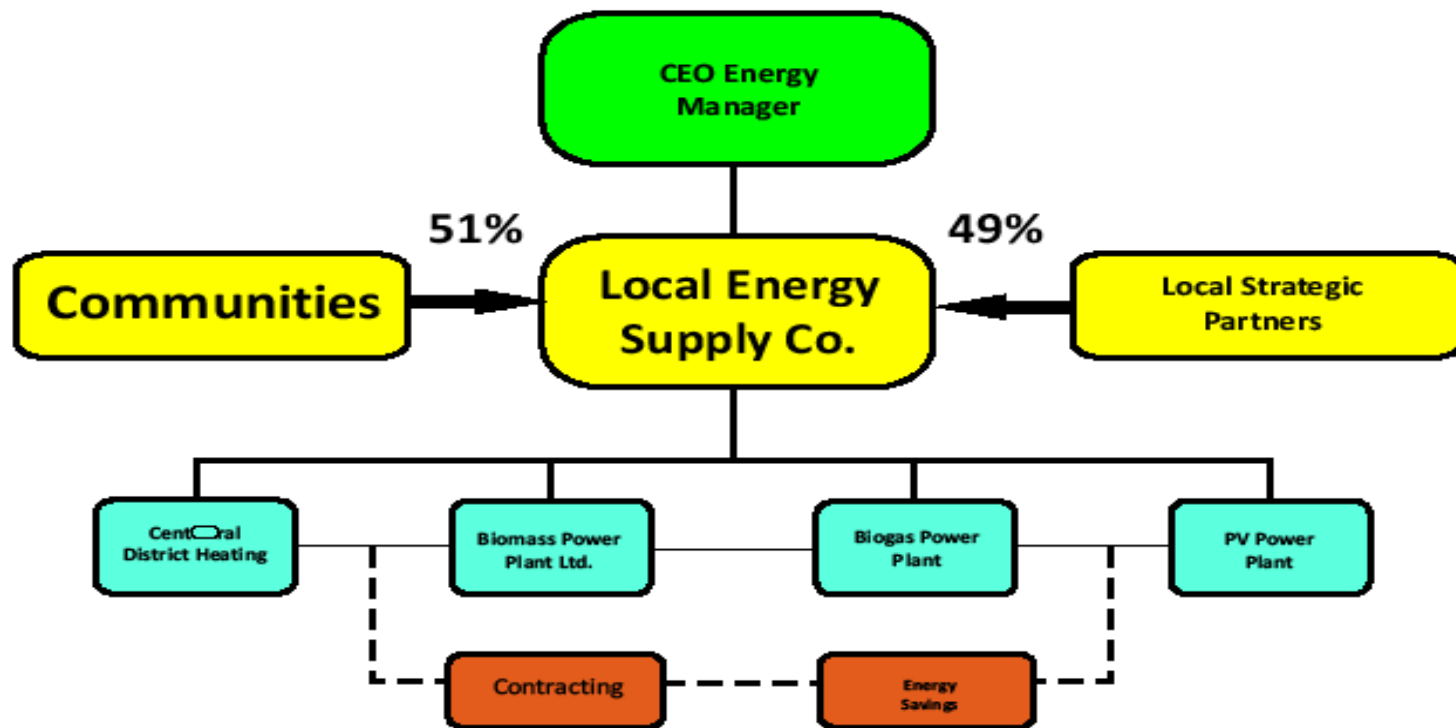
- Update peak thermal demand and monthly
- Review the size and concept for DHS
- Review equipment performance, regulatory constraints and base energy costs
- Determine suitable location for equipment and facilities
- Review suitability of existing piping and trenches



➤ **How can this community support these efforts ?**

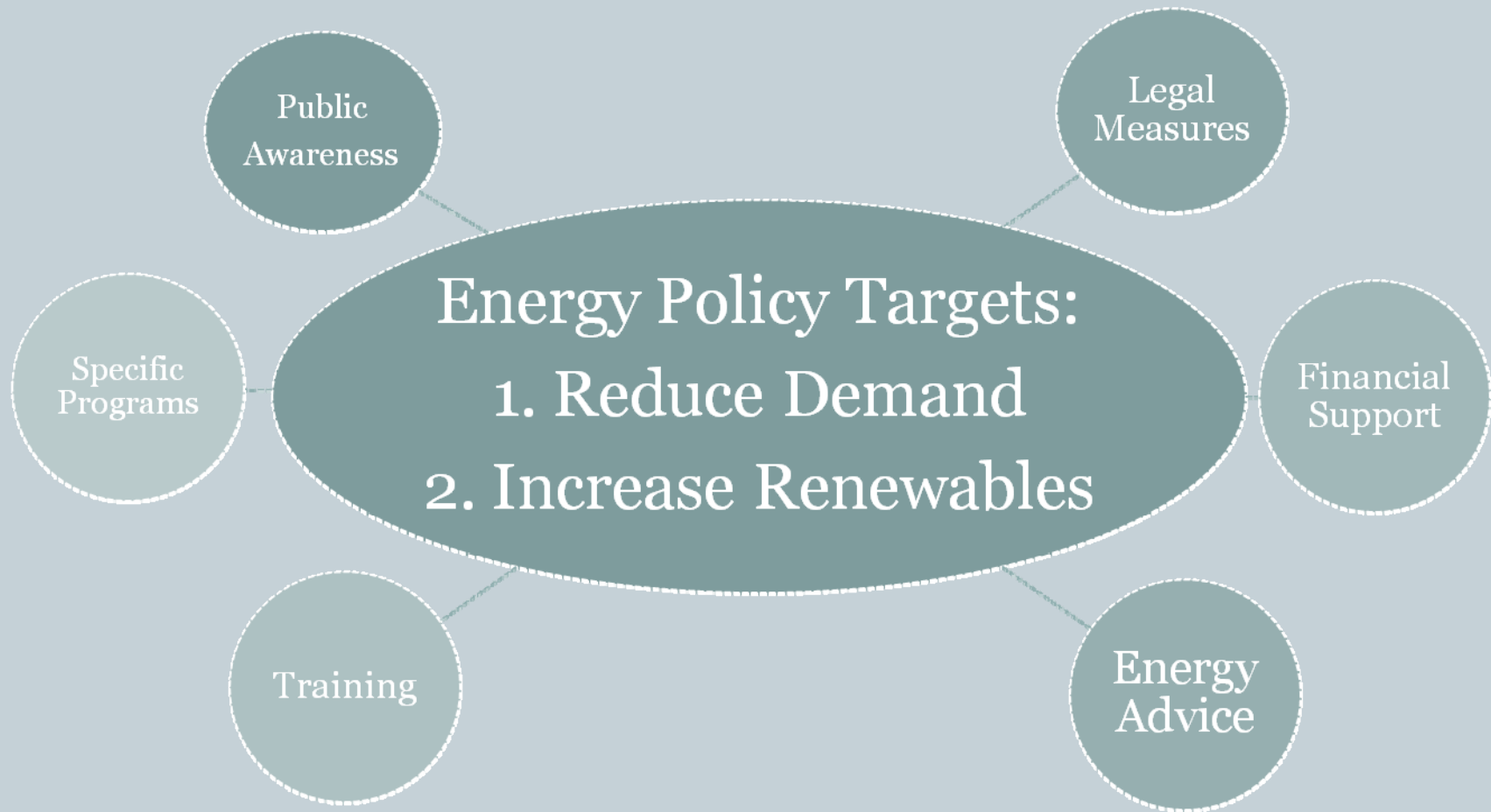
- Support renewable energy technologies
- Support demonstrations projects
- Promote the use of pellets in municipal buildings, businesses in your municipal units and residences
- Support notion of community based corporation

Public Private Partnership Model



Community Based Corporation, Guessing, Austria

Sustainable Energy Policies & Programs in Upper Austria





➤ **Lessons from BEREC**

- **Every successful project requires a strong advocate, supported by true stakeholders - people or groups who stand to gain, lose, or be significantly affected by the proposed system. Identifying and engaging stakeholders is key to success.**
- **There is a strong need for information and education about biomass district energy. The path to implementing these projects is difficult: the lack of readily available educational or technical material may derail first efforts to engage stakeholders, and impede efforts to present a convincing story**

