

# **BioPellets: Clean, Efficient Heating with Renewable Energy from America's Forest Resources**



**Environmental and Energy Study Institute - Woody Biomass: Scale and Sustainability**

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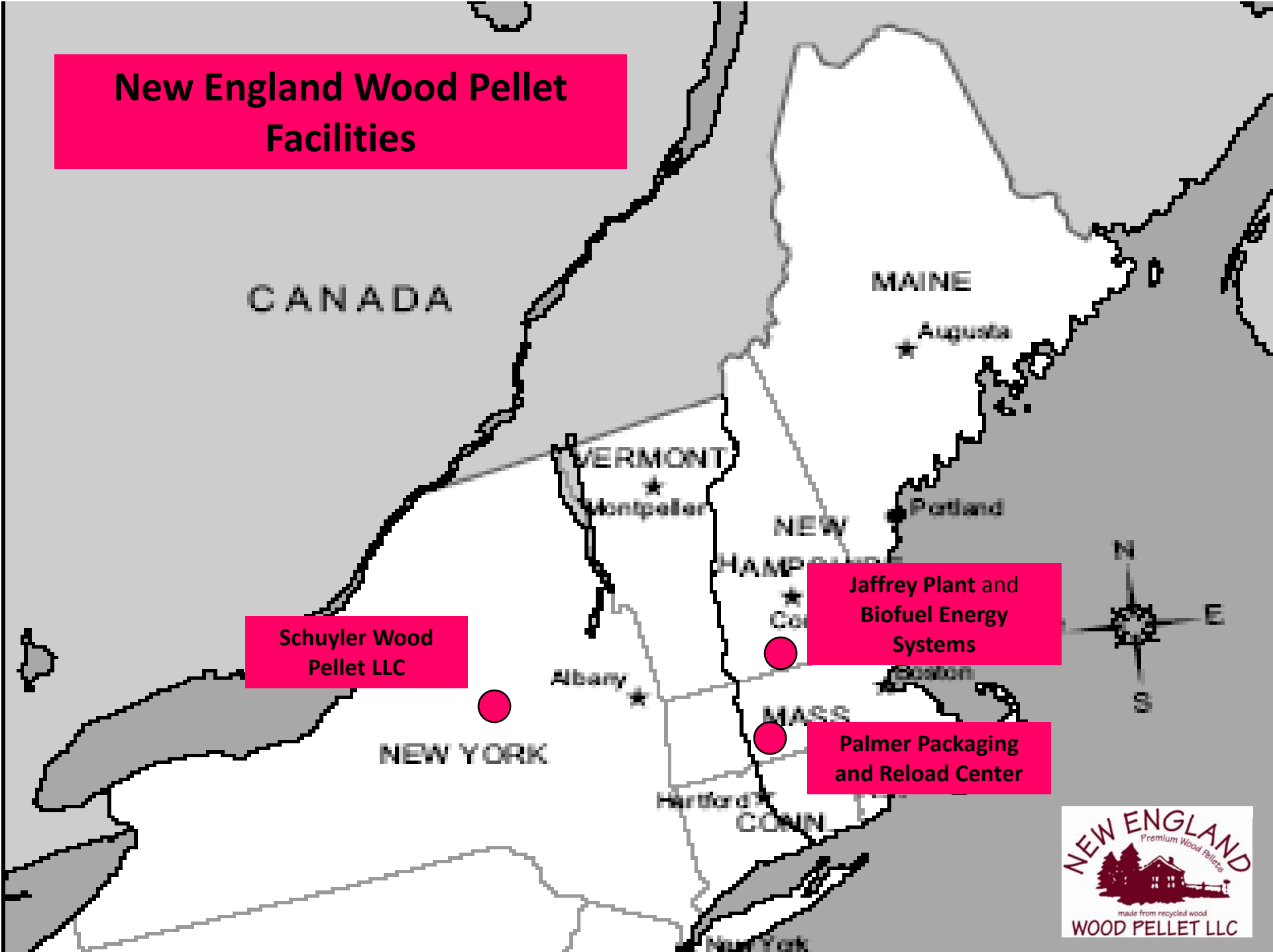
**May 15, 2008**

# Overview

- **Introduction to biopellet fuels**
- **Summary of current and potential biopellet fuels market in northeast and nationwide**
- **Implications to supply and availability of woody biomass resources**



# New England Wood Pellet Facilities



**Schuyler Wood Pellet LLC**  
**Schuyler NY**  
**Grand Opening December 7, 2007**



# Status of BioPellet Industry in U.S.

- **Approx. 800,000 homes heated** (primary or back-up) with biopellet fuel in U.S.; approximate annual growth 10% but accelerating
- **Represents 1/6<sup>th</sup> of 1% of residential heating market in U.S.**
- Total consumption approaching **2 million TPY (EU 10 million TPY)**
- Highest percentages in northeast
- New plants being built across country; significant growth projected
- Experimentation with **new biomass feedstocks**: grass crops, willow hybrid, agricultural residues (corn stover, rice hulls etc.)



# The Harman XXV Pellet Stove



175,000 in New England alone

800,000 in U.S.

## Pellet Stoves

<85,000 BTU

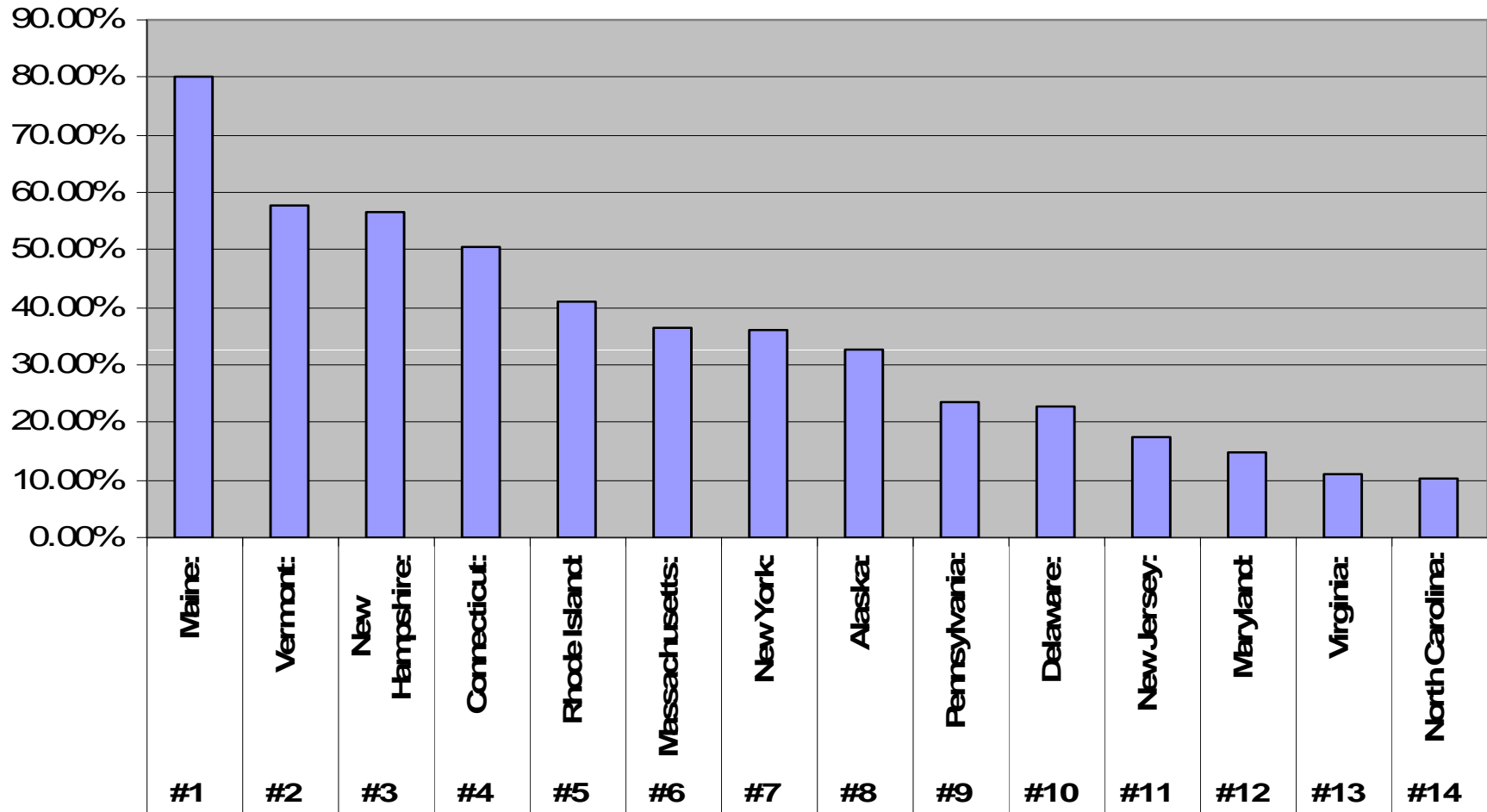
30-50 lbs/day during winter

Thermostatically controlled





## % of Households with Oil as Primary Fuel



# The Potential of the Biopellet Market: *Heating Oil in the Home*

- 4.5 million households heat with oil in New England/New York
- 30-year replacement rate = 152,000 boilers or furnaces replaced each year
- If just 10% switched to biopellet systems = 15,200 new systems/year
- = 75,000 tons per year growth in consumption or one medium-sized new plant per year to keep up with demand



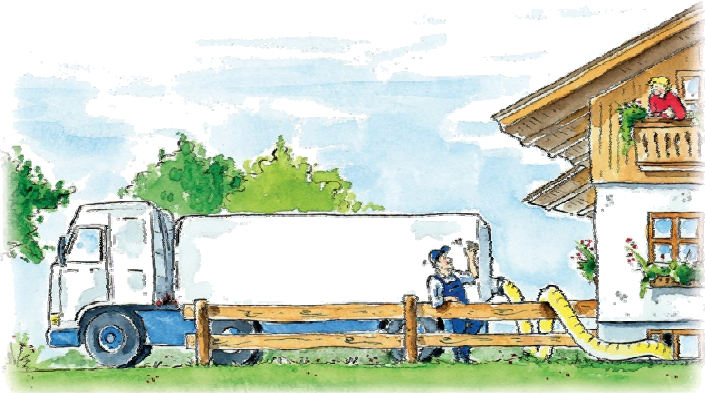


# Pellet Fuels Ideally Suited to Residential Heating in U.S.

- **Abundant, underutilized forest and agricultural resources;** roundwood, chips, manufacturing residues – growing forest inventory and decline in pulp & paper manufacture; clean waste wood as well - throughout U.S. (**USDA estimates 1 billion tons annually**)
- **High energy prices driving transition in residential heating**
- **Huge thermal (heat) market:** 1/3 of total energy consumption in U.S. is for heat
- **New central heating boiler technology becoming available**
- **Bulk pellet fuel distribution:** investment being made to improve efficiency of home delivery
- **Much cleaner air emissions than chunk wood;** new boiler technology comparable to oil/gas emissions



# The Future....not that far off!

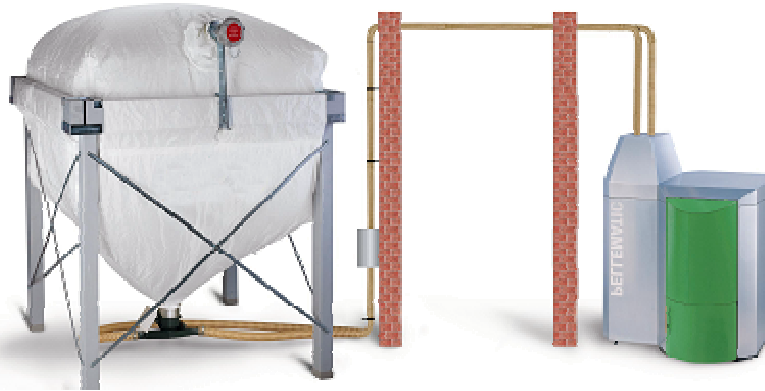


## 1. Home or Business Delivery of Pellets in Bulk

- Much like oil, gas, or propane
- Convenient - you don't need to be there

## 2. Sufficient Storage

- 1-3 deliveries a year
- Attractive and/or unobtrusive



## 3. Fully Automated Central Heating System

- Boilers and furnaces support existing distribution system
- Automated feed system
- Self-ignition and self-cleaning
- Safety that is superior to propane or gas

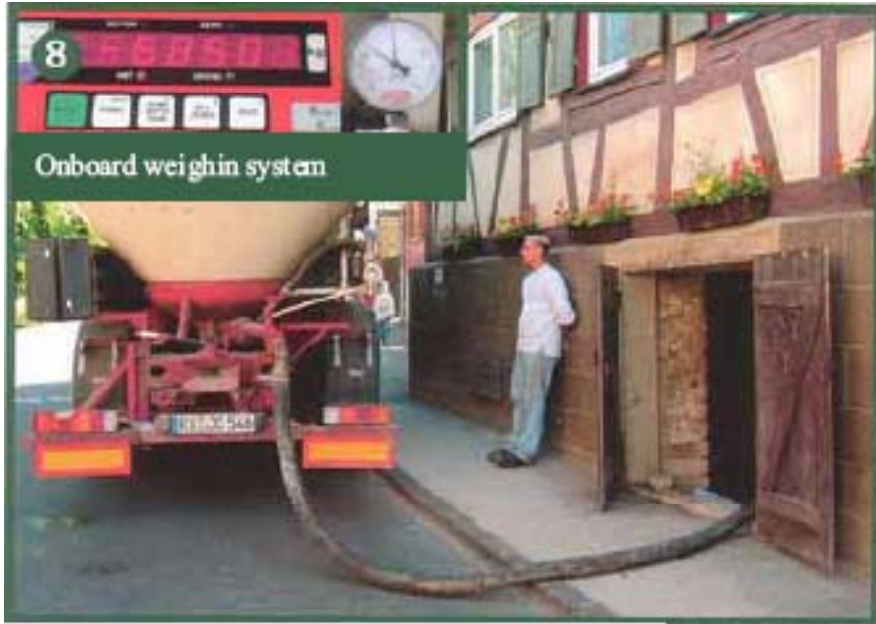
## 4. Easy Installation/Service

- Simple venting
- Simple, once-a-year maintenance includes ash removal



# European bulk storage and delivery...coming soon to U.S.?

Austrian pellet truck



German truck making home delivery with pneumatic feed



Indoor flexible bag silo: 1- 10 tons

# Prediction

- Biopellet fuels will provide **3 to 5 percent of residential heat in America by 2015**
- Represents **50 million TPY** of consumption
- Tremendous local economic benefit
- Significant contribution to reducing carbon emissions from **carbon neutral fuel**
- **Enormous potential in commercial/industrial heat and CHP as well**



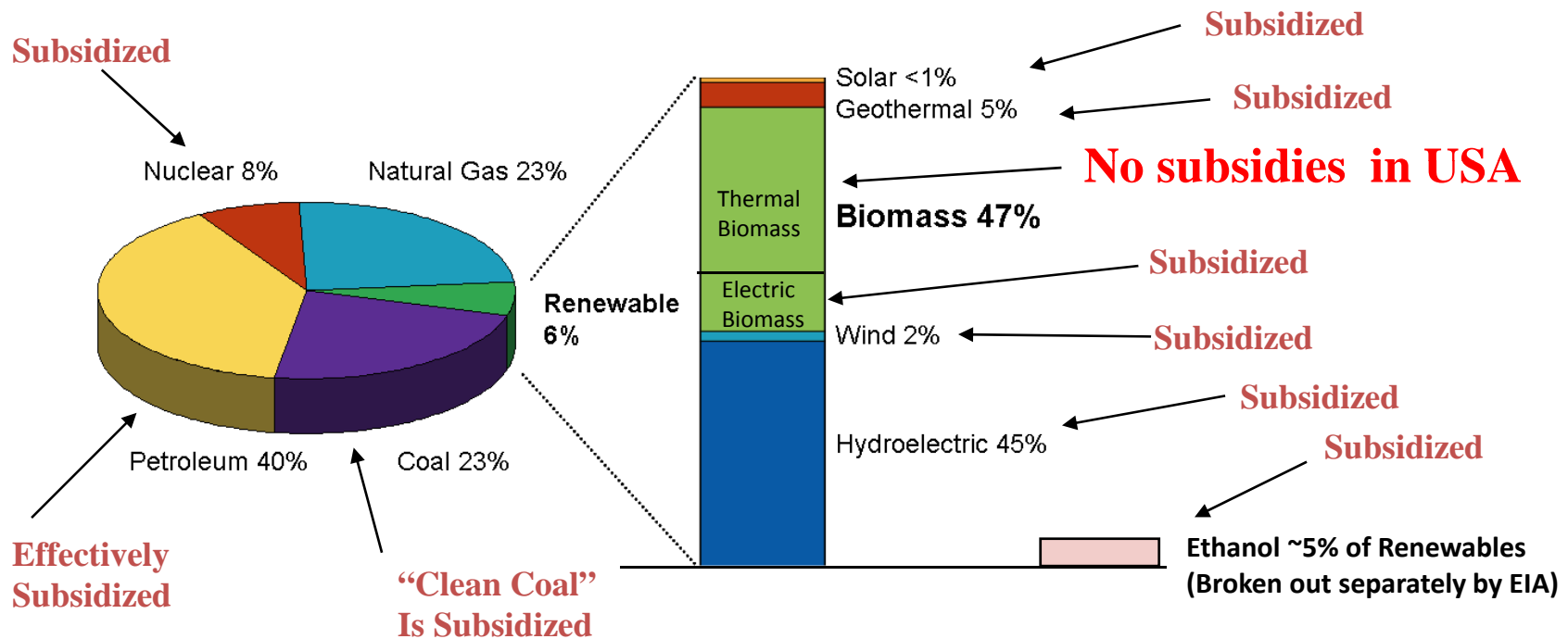
# Where will the biomass come from?

- USDA estimates **1 billion TPY in available biomass – just waste residues (2005)**
- Significant **overstocking of low-grade timber resources** in most parts of country
- **Thinnings to reduce fire hazard** – controversial in some areas
- **Careful sorting of C&D, ground pallets etc.**
- **Fast growing woody biomass crops:** willow, poplar
- **Herbaceous energy crops**



# Biomass heat is the only unsubsidized energy

**Breakout of US Energy Sources, 2004**



Sources:

Michael Pacheco, Director, National Bioenergy Center, NREL; Renewable Energy Trends 2004 data; Energy Information Administration, August 2005. Note: Total U.S. Energy Supply was 100.278 QBTu; Energy Information Administration, August 2005.



# For more information:

New England Wood Pellet LLC

[www.pelletheat.com](http://www.pelletheat.com)

Pellet Fuels Institute

[www.pelletheat.org](http://www.pelletheat.org)