Forest Biomass Supply and Availability in the Northeastern U.S.

Charles D. Ray

There’s plenty of it!
Wood energy is everywhere in the news...
World's largest biomass plant gets environmental clearance

The world's largest biomass power plant has been given environmental permission to proceed with its development.

The 485MW facility, located in the Scottish Highlands, is expected to produce enough electricity to power 350,000 homes.

The biomass will be sourced from a range of sources, including forestry, agriculture, and waste.

The plant is set to be operational by 2025, creating new jobs and reducing carbon emissions.

New £130m Isle of Wight biomass plant planned

Plans are being unveiled for a £130m biomass power plant which could provide more than 20% of the island's electricity needs.

The Energy Policy Centre, proposed at a site near Shanklin in the Isle of Wight, would create 250 jobs.

The plant would use wood waste from local industries to generate heat and electricity.

A planning application is expected to be submitted this year, with construction due to start in 2023.
Wood-chip ethanol maker opens plant

Backup Generators on Phones to be Replaced by a Tool that Can Turn Wood Chips into Ethanol, Step Toward "Green" Energy

The "sorely underdeveloped" plant in Fauquier County, Va., will use a range of technologies to convert the energy potential in wood chips and other biomass into fuel... (full story available)

The plant is expected to produce 100,000 gallons of ethanol per year, which will be sold to local businesses and distributors. The wood chips will be processed through a series of steps, including milling, drying, and fermentation. The resulting ethanol will be distributed to local gas stations and fuel distributors. The plant is expected to create 25 jobs in the local community.

Most Popular

- Google engineers figure have explained in a blog post on their blog how to improve the search for images on the Web.
- Apple's new iPhone 5S features a new camera with a larger sensor.

Bennington Banner

Business plan draws protest

Sunday, November 10, 2013

POWERTAC, a company that develops and manufactures solar panels for the consumer market, has filed a protest with the Federal Energy Regulatory Commission (FERC) against a proposed solar plant in Bennington, Vermont. The company's protest is based on concerns about the project's impact on the local economy and the environment.

POWERTAC's CEO, John Smith, said in an interview, "We are concerned about the impact of this project on the local economy and the environment. We have evidence that this project will negatively impact the local economy and pose a significant environmental risk.

The project is expected to result in the replacement of local businesses and the loss of jobs in the area. We believe that this project is not in the best interest of the local community.

In response, the company's spokesperson, Jane Doe, said, "We are confident that this project will have a positive impact on the local economy and the environment. We believe that this project will create jobs and generate revenue for the local community.

The company has also filed a lawsuit against the Federal Energy Regulatory Commission (FERC) to challenge the project's approval.

Local residents and business owners have also expressed concerns about the project and have organized protests against it. The local government is currently reviewing the project's application and has not yet made a decision.

Read More

1. Two-vehicle crash in Shaftsbury
2. Local businesses protest against solar plant
3. City council approves new solar plant
4. Local newspaper features coverage of the project

Identity Alert System

Identity theft protection

Knowing the symptoms of AMT may save your sight

Free Webinar - AMT Awareness Day 2013

Learn more about the symptoms of AMT and how to protect yourself from this dangerous condition.
So you might think all the wood is being gobbled up!

Not exactly……

- By 1980 USDA estimate, 600 million dry tons/year of “unused” wood
- Using standard btu conversions, this is equivalent to 1.675 billion barrels of oil
- US oil consumption is currently 7.3 billion barrels oil/year
- Nearly one quarter of our oil consumption could be eliminated by full utilization of unused woody biomass
- Carbon-neutral alternative to fossil fuels
368 million dry tons Wood Bioenergy Potential per year


Sawmills
Pressure on the Resource?

- 6 million dry tons annually – from growth of “low-use wood” only
From that report…
Also from that report…

Conversion of the Commonwealth’s stocks of low-use wood to energy and bio-refinery products at a sustainable rate is the most socially responsible and ecologically sensible strategy for this vast, yet vastly underutilized, natural forest resource.

Pennsylvania's Forests – 16 million acres of biological “solar panels” storing carbon energy!

- 658 million tons of our forest is in “under-utilized small diameter” stems; 469 million tons are potentially available for harvest
- This volume of forest wood could yield about 6 million dry tons per year in perpetuity

6 Million Dry Tons Per Year is Equivalent to:

- 600 District Energy Projects
- 5 Wood Ethanol Plants
- 300 Million 40 lb bags of wood pellets
- 475 - 500 million gallons of #2 heating oil (Karakash, 2007)
- 3 million homes
- 480-600 million gals of ethanol
Pressure on the Resource?

- 6 million dry tons annually – from growth only
- “Energizing” forests could be utilized in efforts to accelerate mixed-aged “old-growth” forest structure and increase professional management options

Timber harvest = More management options

- Wildlife management
- Timber stand improvement
- Water resource protection
Pressure on the Resource?

- 6 million dry tons annually – from growth only
- “Energizing” forests could be utilized in efforts to accelerate mixed-aged “old-growth” forest structure and increase professional management options
- New Hampshire experience – even with subsidized energy production in place, round wood prices stay flat

Why wood?

Sources www.nh.gov/oep/index and www.pelletheat.org
Comparative Fuel Prices for Heating

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<tbody>
<tr>
<td>Hardwood Chips ton</td>
<td>$20 - $34</td>
<td>$2.00 - $3.45</td>
<td>$3.10 - $5.30</td>
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<tr>
<td>#2 Fuel Oil gal</td>
<td>$.80 - $1.40</td>
<td>$5.90 - $10.30</td>
<td>$7.85 - $13.75</td>
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<tr>
<td>#6 Fuel Oil gal</td>
<td>$.80 - $1.20</td>
<td>$5.70 - $8.55</td>
<td>$7.60 - $11.45</td>
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<tr>
<td>Electricity kwh</td>
<td>$.06 - $.15</td>
<td>$17.60 - $43.95</td>
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<td>LP Gas gal</td>
<td>$.80 - $1.50</td>
<td>$8.70 - $16.30</td>
<td>$10.85 - $20.40</td>
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<td>Natural Gas ccf</td>
<td>$.65 - $1.00</td>
<td>$6.50 - $10</td>
<td>$8.15 - $12.50</td>
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<tr>
<td>Coal ton</td>
<td>$100 - $150</td>
<td>$4.00 - $6.00</td>
<td>$5.70 - $8.55</td>
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(Biomass Energy Resource Center, 2004)

330 Facilities

46.9 MM tons/yr

60% of woody biomass consumption is for wood products, pulp, and paper

Project-Based Overview of Woody Biomass Initiatives in the Generation of Thermal Energy, Electricity, and Transportation Fuels in the Eastern Hardwood Region of the United States
Projected Woody Biomass Demand, 2008 - 2015

Year | Green Tons Millions
--- | ---
2008 | 46.9
2009 | 50.2
2010 | 54.6
2011 | 56.1
2012 | 58.7
2013 | 58.9
2015 | 59.0

Number of Woody Biomass Conversion Operations Identified in the Northeastern United States

- CT, 7, 2%
- MA, 15, 5%
- ME, 52, 16%
- NH, 51, 15%
- NJ, 2, 1%
- NY, 57, 17%
- OH, 8, 2%
- PA, 67, 20%
- RI, 5, 2%
- VT, 56, 17%
- WV, 7, 2%
- WY, 8, 2%
- MD, 3, 1%
Number of Woody Biomass Conversion Operations in Northeastern United States By Product

- Pellets, 35, 11%
- Charcoal, 3, 1%
- PB, 5, 2%
- Paper, 35, 11%
- OSB, 6, 2%
- MDF, 6, 2%
- Pulp, 2, 1%
- Electricity, 60, 17%
- Ethanol, 6, 2%
- Heat, 172, 51%

Woody Biomass Consumption in Northeastern US By Product

- Pellets, 7%
- PB, 0%
- Charcoal, 2%
- Paper, 37%
- OSB, 5%
- MDF, 3%
- Pulp, 2%
- Ethanol, 5%
- Energy, 33%
- Heat, 6%
That looks like a lot of wood usage….until we make a comparable analysis of wood utilization in Europe.
Austrian Woody Biomass CHP Plants
2002 - 2008

- Six fold increase in biomass CHP plants from 2002 to 2008

Pellet plants in Austria
<table>
<thead>
<tr>
<th>Name</th>
<th>Plant Capacity (tons)</th>
<th>Wood Consumption at 50% MC (tons)</th>
<th>City</th>
<th>In Operation</th>
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<tbody>
<tr>
<td>Log Hard Pellets</td>
<td>50,000</td>
<td>102,120</td>
<td>Spartansburg</td>
<td>current</td>
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<tr>
<td>Wood Pellets Co.</td>
<td>N/A</td>
<td>N/A</td>
<td>Summerhill</td>
<td>current</td>
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<td>Penn Wood Products, Inc.</td>
<td>20,000</td>
<td>22,200</td>
<td>East Berlin</td>
<td>current</td>
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<tr>
<td>PA Pellets, LLC</td>
<td>35,000</td>
<td>77,700</td>
<td>Ulysses</td>
<td>current</td>
</tr>
<tr>
<td>Greene Team Pellet Fuel Company</td>
<td>25,000</td>
<td>66,600</td>
<td>Garards Fort</td>
<td>current</td>
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<tr>
<td>Energex Pellet Fuel, Inc.</td>
<td>120,000 (2010)</td>
<td>244,200 (2010)</td>
<td>Mifflintown</td>
<td>current</td>
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<tr>
<td>Barefoot Pellet Company</td>
<td>40,000</td>
<td>44,400</td>
<td>Troy</td>
<td>current</td>
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<tr>
<td>Bald Eagle Pellet Co.</td>
<td>7,500</td>
<td>8,325</td>
<td>Tyrone</td>
<td>current</td>
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<tr>
<td>Allegheny Pellet Corporation</td>
<td>16,400</td>
<td>33,300</td>
<td>Youngsville</td>
<td>current</td>
</tr>
<tr>
<td>Treecycle Pellet</td>
<td>50,000</td>
<td>102,120</td>
<td>Nazareth</td>
<td>2009</td>
</tr>
<tr>
<td>Stein-David Hardwood</td>
<td>15,000</td>
<td>27,750</td>
<td>Newcastle</td>
<td>2009</td>
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<tr>
<td>Tri-State Biofuels</td>
<td>50,000</td>
<td>102,120</td>
<td>Uniontown</td>
<td>2010</td>
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<tr>
<td>Tinst National Pellet</td>
<td>50,000</td>
<td>102,120</td>
<td>Johnstown</td>
<td>2010</td>
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<tr>
<td>Total</td>
<td>478,900</td>
<td>932,955</td>
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Table 1. Wood Pellet Manufacturers currently in PA (Source: PSU Wood Products Operations Laboratory)

Pellet production in Austria
Pellet consumption in Austria

Installed Biomass Boilers < 100 kW in Austria (1990-2004)
Biomass use for district heating of Austrian villages

- Central heating plant for entire village
  500 kW - 30 MW
- Energy distribution via hot water pipes
- Since 1980 > 1000 plants / approx. 1000 MW heat load
- Based on local initiatives
- Supported by investment subsidies (40-50% for rural projects with agricultural background / max. 30% for enterprises)
What About Pollution?

• Boilers are designed to maintain high temperatures:
  – Few sulfur based compounds
  – NOx compounds similar to natural gas
  – Particulates are removed by a cyclone filter

Conclusions

• Plenty of wood…
• Chip availability dependant on local options
• Pellet availability unlimited and getting better
• Wood-based heating costs lower than alternatives
• Go wood!