

## Wood Energy: The Other Renewable



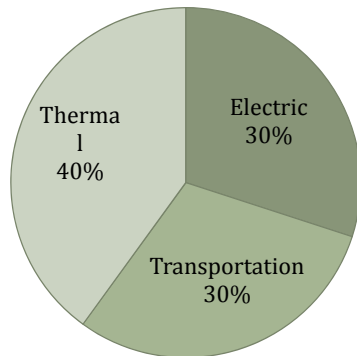
**“Wood Energy-Renewable, Clean, Abundant,  
Affordable & Supporting Local Communities”**

**February 23, 2015 graphic of boot camp soldier**



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## What Type of Energy - Renewables!



- **30% Electrical**
  - Solar, wind, hydro
- **30% Transportation**
- **40% Thermal**
  - Geothermal, biomass (wood)

## What is Woody Biomass?

- Native forests
- Short rotation woody crops (SRWC)
- Sawmill residue
- Urban wood waste – tree removals, construction debris



## Is Removing Biomass From MD Forests Sustainable?

**YES!**

- The Potential for Sustainable Wood-Based Bioenergy in Maryland – Pinchot Institute, August 2010
- Maryland's Forest Biomass Harvesting and Retention Guidelines developed by working group
  - Allows for harvest in an ecologically sustainable manner

We are growing 2.6 times more wood we are removing through harvests or mortality in Maryland!

## Why the MD Wood Energy Coalition?




- Advance wood energy in state policy but no one organization had capacity
- Started in April 2010 by University of MD Extension and DNR Forest Service.
- Representatives of MDE, MEA, DNR, DBED, UME, non-profits (Alliance for Green Heat, Pinchot Institute, MD Forests Assoc., SAF) and wood-based industry started meeting every month.

## Maryland Wood Energy Coalition *Organized April 2010*



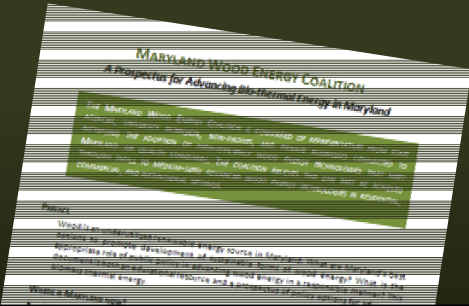
### **Mission:**

- To advance the responsible use of Maryland's vast supply of woody biomass for clean, affordable thermal energy production.
- Best achieved through:
  - small to medium-sized commercial and institutional applications for government, schools, and businesses
  - residential thermal applications.



**A Prospectus For Advancing Biomass Thermal Energy In Maryland**  
Developed By the  
Maryland Wood Energy Coalition  
Specific policy recommendations on Page 2 & 3

**20-page research based document**  
**Released Feb. 2, 2012**  
Available at: [www.extension.umd.edu/woodland](http://www.extension.umd.edu/woodland)



## Justifying Wood as a Heating Fuel

- Renewable – Sustainable – Carbon Neutral
- Stable fuel price
- Energy savings substantial
- Does not rely on tax credits/grants
- Clean burning technology widely available
- Helps low & middle class with energy bills



## Other Considerations...

- Wood from local sources provides energy security
- Contributes to local economic development Maine study – for every \$1 spent on fuel oil for heating, only \$0.15 remains in the local economy.
- Renewable teaching opportunity



## Where Is Maryland Now Regarding Biomass Use?



- Maryland has one wood energy facility – 4 MW Eastern Correctional Institution. Cut fuel costs by 63%
- New regulations in MD
- Maryland behind other states in application
- Technology readily available

## Fuel for Schools -The Vermont Experience

- By early 2007, 30 Vermont Schools installed wood chip heating systems.
- Schools size - 23,000 ft<sup>2</sup> to 390,000 ft<sup>2</sup>; Average - 136,400 ft<sup>2</sup>.
- Schools combined use over 18,400 tons of wood chips/yr.
- Annual fuel cost savings average \$48,000; total statewide savings \$1.5 million.
  - “New” systems are averaging 60% savings in fuel costs.



## The Technology



## The Vision

### Create a whole new industry!

A few benefits:

- Jobs
- Better management
- Wealth retention
- Energy independence
- Energy security/reliability



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## Promise of Wood

### From Consumer Perspective:

- Cheap
- Predictable
- Clean
- Sustainable
- Fuel \$ stay local



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## Promise of Wood

### From Forester perspective:

- Market niche
- Improved silviculture
- Ubiquitous: rural - urban
- Market steady and reliable



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## Promise of Wood

### From Public generally:

- Clean
- Retains wealth
- Responsible
- Safe
- Secure
- Dispatchable



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## Coalition Activities to engage & educate policymakers, regulators & industry



- Two statewide wood energy conferences in November 2012 & October 2013.
- Two-day tour of wood energy facilities in PA Feb/Mar 2012 & 2013
- UME Residential heating workshops
- Research on outdoor wood boilers
- Biomass Boot Camp

## PA Wood Energy Tour – Feb 2013



Ebenshades Greenhouse, PA



### Coalition's Four Priorities Addressed May 2014

- 1) Update MDE air emission regulations **DONE!**
- 2) Establish thermal renewable energy credits as an incentive **In Progress!**
- 3) Provide sustained support for the Maryland Wood Grant Program **DONE!**
  - \$50K pilot program by MEA extended indefinitely
- 4) Public agencies & facilities to lead the way
  - Dept Gov Service promoting biomass as a fuel **In Progress!**

### Major Barrier to Biomass Use Removed April 28, 2014

- Prohibition on use of biomass in commercial boilers since 1972.
- We now know the rules...

Size of Boiler MMBtu	Particulate Emissions (lb/MMBtu)	
	Rural Area Areas I, II, V & VI	Urban Areas Areas III & IV
1.5 – 10	0.35	0.1

## What About Emissions of Biomass Boilers?

Negative perception unwarranted!  
Modern systems readily meet standards:  
Rural area, <0.23lbs/mmBtu-hr  
Urban area, <0.1lbs/mmBtu-hr



Fuel Type	NO <sub>x</sub>	SO <sub>2</sub>	Hg	Particulate Matter	Greenhouse Gases
Coal	High	High	High	Medium	High
Oil	Medium	Medium to High	Medium	Low	High
Natural Gas	Medium	Negligible	Negligible	Low	High
Wood	Low	Low	Negligible	Medium	Low

## Thermal Renewable Energy Credits SB 154 & HB636 – In Legislature NOW

- Modify State Renewable Energy Portfolio Standards(RPS).
- Establish separate tier for thermal renewable energy credits (TREC's).
- Woody biomass (other biomass) is an eligible thermal energy source as is geothermal.
- Annual revenue from TREC's help to attract capital investment.

Wood Energy Infrastructure More Costly for Woody Biomass Boilers

Projects pay for themselves based on fuel savings compared to fossil fuels



### Fuel Cost Comparisons

If wood chips cost \$40/ton, then you could pay no more than...

\$0.55/therm	Natural Gas
\$0.80/gal	#2 Oil
\$.50/gal	Propane
\$0.023/kWh	Electric



Or...

Nat Gas	\$0.55/therm	=	<u>WOOD</u>
#2 Oil	\$3.25/gal	=	\$40/ton
Propane	\$1.75/gal	=	\$162/ton
Electric	\$0.09/kWh	=	\$140/ton
			\$155/ton

## Economic Impact in MD

Table 2 – MD State Fuel Oil and Propane Use and Cost for Thermal Applications

Sector	Total Distillate & Residual Oil Use, gal	Total LPG Use, gal	Thermal Distillate & Residual Oil Use, gal	Thermal LPG Use, gas	Dollars Spent on Thermal	Dollars Leaving Maryland
Residential	115,668,000	89,124,000	115,668,000	57,173,887	\$605,732,947	\$454,299,710
Commercial	61,446,000	35,868,000	32,530,235	18,988,941	\$119,892,439	\$89,919,329
Industrial	63,840,000	19,194,000	26,174,400	9,980,880	\$91,116,631	\$68,337,473
Transportation	581,112,000	3,192,000	0	0	\$0	\$0
<b>Total</b>	<b>822,066,000</b>	<b>147,378,000</b>	<b>174,372,635</b>	<b>86,143,708</b>	<b>\$816,742,017</b>	<b>\$612,556,513</b>

**Major impact if only 20% of this** could stay in Maryland by using wood for thermal applications in commercial class buildings.

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The Door Is Open...Who Will Enter!



## Woody Biomass

Maryland has many opportunities for similar projects:



Universities



Public Schools



Military Bases



Government Districts



Poultry Houses



Office & Retail Complexes



Prisons

## Biomass Boot Camp

*Immerse new recruits into renewable biomass culture*

- Session 1: Biomass Fuels
- Session 2: The Technology
- Session 3: Development Considerations
  
- When you leave you will be ready for duty!!
  
- Planning Wood Energy day trip to Bedford PA in March. Are you interested?



## Questions?



Look! No  
Smoke!



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