



# BRANCHING OUT

Maryland's Forest Stewardship Educator

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## THE POTENTIAL FOR WOOD ENERGY

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As fossil fuel prices continue to increase, one of the oldest sources of renewable energy is again being considered—wood. Firewood was the main source of heat for centuries before the switch to coal, and then oil and natural gas. The use of firewood to heat individual homes has always been utilized but for a small percentage of households. Recent fuel price increases will likely result in more individual wood burners but the real story is the larger scale use of wood to heat communities, hospitals, schools, and other commercial facilities. With the advent of new technologies for converting wood to energy, and the associated improvements that reduce pollutants and ease transport, wood energy is being looked at to provide localized and decentralized sources of power for local communities. Instead of measuring wood in cords of firewood for use in a home, wood is chipped and measured and sold by the ton.

The United States is only now developing policy to promote wood energy, but other European countries, such as Austria, have made a national commitment for decades to developing wood energy, and we can learn from their example. Fifteen natural resources professionals from Pennsylvania, Maryland, New York, and North Carolina recently traveled to Austria to see firsthand how their national energy policy has resulted in 13% of their energy being produced from wood, with a target of 25% by 2020. They have done this by introducing wood into “new” markets; district heating of rural villages and towns; medium scale biomass heating projects like schools, town halls, etc.; wood pellet heating for single homes; and cogeneration of heat and power.

Since 1980 Austria has built more than 1,000 biomass district heating plants averaging 1 megawatt output to heat villages with hot water using a variety of funding policy strategies. Larger woody biomass plants that produce heat and power

increased from only 22 plants in 2002 to 119 plants in 2008, producing a total of 348 megawatts, a significant amount of energy. Austria has made these investments to become more self-sufficient and not depend on foreign countries for natural gas and oil—sound familiar? They, like

the United States, had significant wood resources and they developed the policy and political will at the national and local level to make it happen.



One value of using domestic wood energy sources is improved local economic development. Presently, much of the money we pay for energy goes out of the community to national or foreign governments. By developing local wood energy facilities, the dollars stay in the community to create infrastructure local jobs. Examples of wood energy facilities can be found in Maryland and elsewhere, and one of the driving forces for these projects is the savings in

fuel costs by using wood energy to produce hot water and steam for medium scale heating projects in schools, prisons, hospitals, colleges, etc.

For example, the Eastern Correctional Institution, a 3,400 bed prison on the eastern shore has provided heat and power for the facility since 1987 using wood chips from forestry operations—a 63% saving on fuel costs. Mountain View Schools in Susquehanna County, PA, implemented a project to heat the existing high school and new elementary school, saving 90,000 gallons of oil per year for a savings of \$120,000 a year or \$80 per student. Vermont has 25 schools that are heating with woodchips and reduces costs by 50% compared to heating with oil. As county and municipal school districts struggle with how to balance their budgets, wood is an attractive option, but rarely considered due to lack of knowledge.

Above and beyond the energy security and economic benefits wood energy provides, environmental improvements are realized since wood has low sulfur and nitrogen emissions and is carbon neutral. This means that while carbon is released by burning, the trees are re-grown, zeroing out the carbon balance. Developing a wood energy market would greatly improve forest stewardship by providing a needed market for low-value timber as well as salvage from natural disasters and insect and disease kills.

If wood energy has so much promise, why is our public policy so undeveloped? The focus on ethanol and other technologies has been a distraction, but wrongful

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assumptions about the use of wood and forests can also be a factor. Much of our energy is produced using boilers that produce hot water or steam, which is then used to produce electricity or hot water. Instead of using fossil fuels, wood chips become the main fuel. This wood can come from sustainable forest management practices or it can come from the enormous quantities of urban wastewood. Presently, much of the wood from fallen trees or construction sites is landfilled, a wasteful practice that reduces the life of a landfill considerably. Burning this material to produce energy makes much more sense.

A recently completed report by the Harry Hughes Center for Agroecology provides estimates of regional inventories of wood residues, by products and wastes, and some of the opportunities for new and existing markets for products made from wood in Maryland and Delaware. It will be available soon online at:

<http://agroecol.umd.edu/Research/forestry1.cfm>

There are many new technologies, such as gasification, that are being developed to burn wood more efficiently and produce biogas, but more research is needed. Many of these technologies are known, available now off the shelf, and capable of being implemented immediately.

There is a great need for more projects and policy initiatives in Maryland to validate the benefits and cost savings for local communities to use wood energy. Prisons, hospitals, schools and other public facilities provide excellent options for public/private partnering. Most of the references to the use of biomass in Maryland refer to agricultural products, not wood. Hopefully, this will change with better education and policy.

If you are interested in learning more about the use of wood to produce energy, check out the following online resources:

- \* USDA Forest Service  
[www.fpl.fs.fed.us/tmu/wood\\_for\\_energy/wood\\_for\\_energy.html](http://www.fpl.fs.fed.us/tmu/wood_for_energy/wood_for_energy.html)
- \* Southern Forest Research Partnership  
[www.forestbioenergy.net](http://www.forestbioenergy.net)
- \* US Dept. of Energy  
[www1.eere.energy.gov/femp/pdfs/bamf\\_woodwaste.pdf](http://www1.eere.energy.gov/femp/pdfs/bamf_woodwaste.pdf) ☒

## FIREWOOD FUEL COMPARISON

The high price of fossil fuels has many homeowners looking again at wood heat as an option to heat their homes. Wood harvested from your own woodlot can provide some of what is needed. Wood from thinning, storm damage, insect infested, and diseased trees can be utilized to save you dollars. A well-managed woodlot can usually produce about 1/3-1/2 a cord of firewood per acre per year, so if you have about 3 acres of woods you can produce about a cord of wood per year.

Change in Firewood Prices (2006/2008)

|                      | 2006  | 2008  |
|----------------------|-------|-------|
| <b>Western MD</b>    |       |       |
| Allegany             | \$100 | \$100 |
| Washington           | 120   | 175   |
| Frederick            | 150   | 177   |
| Carroll              | 158   | 180   |
| <b>Central MD</b>    |       |       |
| Baltimore            | 161   | 195   |
| Harford              | 151   | 186   |
| Mont/Howard          | 175   | 230   |
| <b>Southern MD</b>   |       |       |
| Charles              | 128   | 148   |
| Anne Arundel         |       | 178   |
| St. Mary's           | 190   | 222   |
| <b>Eastern Shore</b> |       |       |
| Cecil                | 190   | 185   |
| Shore Counties       | 165   | 150   |

Many homeowners lack the costly equipment (chainsaw, truck, etc), the knowledge, and/or the time to harvest their own wood, so they must buy it. According to Maryland law, wood must be sold by the cord, which means

when stacked it measures 4' wide by 4' tall by 8' long. Most 1/2 ton pickups can only hold about one-half a cord so beware of buying wood by the truckload.

In the fall of 2006 and September of 2008, the University of Maryland Cooperative Extension did a survey of firewood prices by recording online internet advertisements in newspaper classified ads around the state. Prices were collected for cords of seasoned oak or hardwood delivered. The results of this informal survey indicate significant increases in prices in the more populated areas of the state starting this year due to the recent increases in fuel cost. While no formal survey was done for 2007, the price increases actually occurred this year.



## MARYLAND ADOPTING NEW WOOD-FIRED BOILER REGULATIONS

With the cost of oil and gas on the increase, many homeowners have installed, or are considering installation of, wood-fired boilers for heating and hot water needs in the winter as well as year-round.

Wood-fired boilers are of particular concern to the Maryland Department of the Environment (MDE) because the stack emissions are higher than other wood burning appliances, resulting in an increase in particulate pollution. As a result these boilers are now illegal.

On September 4, 2008, the MDE hosted a stakeholder meeting to discuss the growing issues over wood-fired boilers. New regulations have been drafted to help the State's efforts to reduce fine particulate pollution. The new regulations will also ensure that wood-fired boilers sold and operated in Maryland are fitted with the latest pollution control technology as well as operating according to the manufacturer's specifications.

The Department may grant an exception for wood boilers purchased or installed before October 1, 2009, if the Department determines that the operation of the boiler does not create a nuisance. The exception will remain in effect until October 1, 2014. This exception is vague enough that owners of existing boilers have cause for concern about how terms such as nuisance are defined.

The new regulations could be in place as early as next fall (October 1, 2009). For now, the MDE plans another stakeholder meeting on October 10, 2008, and from that meeting, they will prepare a formal response and begin public education. If you wish to be part of the process, please send your comments to Randy Mosier—Maryland Department of the Environment: [rmosier@mde.state.md.edu](mailto:rmosier@mde.state.md.edu)

For more details of the draft regulations, see the posting at our website:

[www.naturalresources.umd.edu/pdfs/MDDraftWBRegulations.pdf](http://www.naturalresources.umd.edu/pdfs/MDDraftWBRegulations.pdf)



## SEASONAL CHECKLIST



- ☑ Review your Forest Stewardship Plan and prioritize objectives for 2009 and make any necessary updates.
- ☑ Evaluate young plantings for survival rate. If rate is less than 200 trees per acre, plan for reinforcement plantings this fall.
- ☑ Manage Vole Damage—Resources:
  - Fact Sheet #654 Wildlife Damage Management—Reducing Vole Damage to Plants <http://extension.umd.edu/publications/PDFs/FS654.pdf>
  - Managing Vole Damage to Forest Plantations [www.naturalresources.umd.edu/Pages/Vole\\_fs.pdf](http://www.naturalresources.umd.edu/Pages/Vole_fs.pdf)
- ☑ Plan Spring Planting:
  - Initial site preparation: Penn State Extension—Tree and Shrub Planting Guidelines: [www.ext.vt.edu/pubs/trees/430-295/430-295.html](http://www.ext.vt.edu/pubs/trees/430-295/430-295.html)
  - The State Nursery Catalog available soon at: [dnrweb.dnr.state.md.us/forests/nursery/emailform.asp](http://dnrweb.dnr.state.md.us/forests/nursery/emailform.asp) or call 1-800-TREESMD
- ☑ Erosion and Drainage Control: Check landscape for erosion. Keep drainage ditches and culverts clear of leaves and sticks.

## HOW MUCH CAN YOU SAVE?

### BURNING FIREWOOD/WOOD PELLETS FOR HEAT

The burning of firewood or wood pellets in a stove for heat has gained great interest as fossil fuel prices have escalated. It takes an investment to purchase a stove and properly install and operate it, but the savings can be substantial.

Heating value of any fuel is measured in British Thermal Units (Btu). One Btu is the amount of energy required to raise a pound of water 1 degree Fahrenheit. Different types of heaters burn fuel at different efficiencies. For example, the average efficiency of an airtight wood stove is around 50%, but oil and gas burners may be 65-80%.

Comparison of the cost of various heating fuels can be made on the basis of their heat equivalents as expressed in dollars per million BTU (\$/MBtu). Assuming it takes about 60 million Btu's to heat a home for the winter, your total heat bill can be estimated. The table provides the heat cost comparisons using current regional prices of various fuels.

The cost to heat for the winter ranges

from a high of \$1836 for an air source heat pump to \$409 using firewood at \$150 a cord. Wood pellets are still costly at \$909. You can see that by providing your own firewood, your winter heating costs can be dramatically reduced.

| Heating Fuel Comparison Chart                  |           |            |                     |                         |                       |
|--|-----------|------------|---------------------|-------------------------|-----------------------|
| (Prices are based on current regional values.) |           |            |                     |                         |                       |
| Fuel Type                                      | Fuel Unit | Price/Unit | Fuel Price (MBtu's) | Heating Unit Efficiency | Fuel Cost for Winter* |
| Fuel Oil                                       | Gallon    | \$3.68     | \$26.53             | 78%                     | \$1,592               |
| Electricity                                    | KW Hour   | \$0.10     | \$30.60             | Air Heat Pump           | \$1,836               |
| Propane  | Gallon    | \$2.45     | \$26.82             | 78%                     | \$1,609               |
| Natural Gas                                    | Therm     | \$1.39     | \$13.90             | 78%                     | \$834                 |
| Pellets  | Ton       | \$250      | \$15.15             | 80%                     | \$909                 |
| Wood   | Cord      | \$250      | \$11.36             | 60%                     | \$682                 |
| Wood   | Cord      | \$150      | \$6.82              | 60%                     | \$409                 |

\* Assume 60 million BTU's needed for winter heat

To calculate your heating costs try the U.S. Dept of Energy fuel calculator: [www.eia.doe.gov/neic/experts/heatcalc.xls](http://www.eia.doe.gov/neic/experts/heatcalc.xls)

For more information on producing firewood from your woodlot, go to: [www.ces.ncsu.edu/nreos/forest/woodland/won-14.html](http://www.ces.ncsu.edu/nreos/forest/woodland/won-14.html)

For more information on buying firewood in Maryland, go to: [www.dnr.state.md.us/forests/forester/firewoodinfo.html](http://www.dnr.state.md.us/forests/forester/firewoodinfo.html) ☒



## ATFS RECEIVES PEFC ENDORSEMENT

August 7, 2009: The American Tree Farm System® (ATFS) received international approval by the Programme for the Endorsement of Forest Certification (PEFC). PEFC is an international, independent, non-profit, non-governmental organization, founded in 1999 that promotes sustainably managed forests through independent third party certification. With this endorsement, new green markets open up to American growers. See full story online at [www.naturalresources.umd.edu/PDFs/PEFC.pdf](http://www.naturalresources.umd.edu/PDFs/PEFC.pdf) ☒

## 2009 SPRING SEMESTER:

### GENERAL FORESTRY COURSE OFFERED

The University of Maryland Cooperative Extension is offering the General Forestry Course this during the spring semester (February 1 through May 20). Registration opens January 2, 2009.

There are no formal classes and you work from the comfort of your home using the woodlot you may own, a friend or neighbor's woodlot, or a public forest. The course can be accomplished in two ways—a web-based version that requires internet connectivity, or a notebook (paper-based) version that does not require internet

connectivity. Both methods require supplemental readings. You will learn forest techniques including how to protect your trees from insects and diseases, how to inventory your forest and analyze a tree stand, the business of forestry, and much more. Ultimately, the course exercises help you develop the framework for a forest management plan.

To date, over 300 individuals have completed the General Forestry Course and have taken an educated approach to managing their forests. By taking the course, you too can set objectives and realize many benefits, including increased wildlife, aesthetic appeal,

ecological benefits, and possibly monetary income through the development of forest products.

The course costs \$300.00 and a certificate of completion is awarded. For more information and to register, visit the General Forestry website at the address below. For questions, contact Nancy Stewart, Instructor and General Forestry Course Administrator, by phone at 410-827-8056, ext. 112 or email ([nstewar1@umd.edu](mailto:nstewar1@umd.edu)).

[www.agnr.umd.edu/extension/elearning/generalforestry](http://www.agnr.umd.edu/extension/elearning/generalforestry)





WEB RESOURCES

FOREST STEWARDSHIP EDUCATION WEBSITE: [www.naturalresources.umd.edu](http://www.naturalresources.umd.edu)  
 The Forest Stewardship Education website provided by the University of Maryland Cooperative Extension offers many downloadable and linked resources. You will find many publications including fact sheets, information sheets, and bulletins. In addition, Forest Stewardship Education has the latest on Maryland Forestry Events and News. Coming soon—a new and improved Forest Stewardship Education website! Stay tuned...

ID It! [www.cnr.vt.edu/DENDRO/DENDROLOGY/idit.htm](http://www.cnr.vt.edu/DENDRO/DENDROLOGY/idit.htm)  
 At the Dendrology homepage at Virginia Tech, you can identify shrubs and trees using dichotomous keys. This website offers over 800 fact sheets on trees and related information. ❀

INFO CHIPS

EAB FOUND IN CHARLES COUNTY, MD

Posted 9/4/2008: The MDA reports Emerald Ash Borer was found two miles south of the Prince George's County eradication zone. Northern parts of Charles County have been added to the quarantine. Read the complete story at: [www.mda.state.md.us/article.php?i=13220](http://www.mda.state.md.us/article.php?i=13220)

WILMER STONE WHITE OAK NEW STATE TREE

July 31, 2008: The Wilmer Stone White Oak in Arnold Park, Anne Arundel County, was officially named the new state tree. Despite its awkward appearance—wounded by its own weight—the champion white oak should be around for a long time. See full article online, from the Baltimore Sun: [mobile.baltimoresun.com/detail.jsp?key=201206&rc=null&full=1](http://mobile.baltimoresun.com/detail.jsp?key=201206&rc=null&full=1)

2008 VOLUNTEER FIRE ASSISTANCE GRANTS

Posted August 25, 2008: The Maryland Department of Natural Resources awarded 37 volunteer fire departments located in 12 counties with a 2008 Volunteer Fire Assistance (VFA) grant to increase their capacity for wildland fire suppression. Read press release posted at: [www.dnr.state.md.us/dnrnews/pressrelease2008/082508a.htm](http://www.dnr.state.md.us/dnrnews/pressrelease2008/082508a.htm)

NEW USDA INVASIVE PLANTS FIELD GUIDE

The USDA Forest Service has issued an updated "Invasive Plants Field and Reference Guide: An Ecological Perspective of Plant Invaders of Forests and Woodlands." For a copy, contact Rod Whiteman, USDA Invasive Species Coordinator, at 304-285-1555 or [rwhiteman@fs.fed.us](mailto:rwhiteman@fs.fed.us)

MARBIDCO—NEW FORESTRY LOAN PROGRAM

MARBIDCO has a new program designed especially to help Maryland's smaller forestry-related enterprises to access capital for business modernization. The program is called The Forestry Equipment and Working Capital Loan Fund. To obtain an application, visit: [www.marbidco.org](http://www.marbidco.org)

UNIVERSITY OF MARYLAND COOPERATIVE EXTENSION  
[www.naturalresources.umd.edu](http://www.naturalresources.umd.edu)

**CONTRATULATIONS! 2008 TREE FARMER OF THE YEAR**  
**Senator J. Lowell and Sharon L. Stoltzfus**

Senator J. Lowell and Sharon L. Stoltzfus of Somerset County were chosen by the Maryland Tree Farm System and honored for outstanding stewardship in managing forest resources and increasing public understanding of the benefits of sustainable family forestry.

See full story at: [www.naturalresources.umd.edu/pdfs/MTFSNews3.pdf](http://www.naturalresources.umd.edu/pdfs/MTFSNews3.pdf) (page 2)

UPCOMING EVENTS

| Date / Time                                | Event Details   |
|--|---|
| 10/15/08<br>9:00 am to 3:15 pm             | <b>Society of American Foresters Maryland Delaware Division Fall Meeting and Tour:</b> Allegheny College, Cumberland, MD—Enterprise Opportunities for Small Acreage Forestry Applications / Nonindustrial Private and Family Forestry. To register, contact Pam Thomas at <a href="mailto:pthomas@umd.edu">pthomas@umd.edu</a> or 301-432-2767 x315   |
| 10/18/08<br>9:00 am to 3:30 pm             | <b>Walnut Council Fall Workshop:</b> Baltimore County, MD—Agenda includes a field tour by wagon ride with discussion and demonstration, land preservation programs presentation, lunch, hair sheep and Christmas tree production presentations. For more information, see full agenda at: <a href="http://www.naturalresources.umd.edu/PDFs/WalnutCouncilFall2008Workshop.pdf">http://www.naturalresources.umd.edu/PDFs/WalnutCouncilFall2008Workshop.pdf</a> |
| 10/21, 22, 23 and 31<br>9:00 am to 3:30 pm | <b>GPS Training:</b> Western Maryland Research and Education Center; Keedysville, MD October 21, 22 and 31—Beginner GPS Training; October 23—Terrain Navigator and GPS. For complete details, go to: <a href="http://www.naturalresources.umd.edu/GPS.cfm">http://www.naturalresources.umd.edu/GPS.cfm</a>  |
| 10/31/08 - 11/1/08<br>8:00 am to 4:00 pm   | <b>2008 Maryland Forest Association Annual Conference—Renewable Energy and the Role of Forests and Forestry:</b> Loews Annapolis Hotel—Annapolis Historic District For more information, go to: <a href="http://iaa.umd.edu/mfa/AM2008.htm">http://iaa.umd.edu/mfa/AM2008.htm</a>   |
| 11/4, 6 and 18<br>9:00 am to 3:30 pm       | <b>GPS Training:</b> Wye Research and Education Center (WREC); Queenstown, MD November 4 (WREC) and 18 (UMES)—Beginner GPS Training November 6—Terrain Navigator and GPS (Location: WREC) For complete details, go to: <a href="http://www.naturalresources.umd.edu/GPS.cfm">http://www.naturalresources.umd.edu/GPS.cfm</a>  |
| 11/11/08                                   | <b>Landscapes and Backyard Woodlots—Business Opportunities for the Green Industry:</b> For more information, go to: <a href="http://www.naturalresources.umd.edu">www.naturalresources.umd.edu</a>  |

**Branching Out**

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