WOODY BIOMASS:
Report from a Session to Consider Near-term Investment Opportunities

U.S. Endowment
for Forestry and Communities

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Report from a Session to Consider Near-term Investment Opportunities

Summary Outcomes from a Gathering
Hosted by the USDA Forest Service and
the U.S. Endowment for Forestry and Communities

By

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Introduction

The USDA Forest Service State & Private Forestry (USFS S&PF) and the U.S. Endowment for Forestry and Communities (Endowment) convened a small, non-traditional group of interests to gather fresh perspectives, grounded in real world application. The discussion centered on opportunities to advance sustainable use of woody biomass as a "green energy" source that would benefit forest health and provide additional management and revenue options for landowners. Both organizations are seeking targeted and appropriate investment opportunities. For 2010 the USFS has $5 million to invest with an expected increase to $25 million in the next two years. The Endowment has allocated $2 million for similar work in 2010-2011. *This summary of the discussion is intended to be a high-level overview rather than a consensus draft that all organizations and/or individuals have ascribed to.*

Currently, more barriers than opportunities exist for the utilization of woody biomass for energy. Coal and natural gas are still relatively inexpensive, in terms of access to supply, reliability, cost and ease of delivery, as compared to biomass. From a cost-effective stand point, with the exception of certain dedicated woody crops, woody biomass will likely continue to function as a by-product of value-added wood use.

Additionally, woody biomass does not operate on a level policy and incentive playing field with other renewables (e.g. wind and solar). Woody biomass is still expensive to access and handle. Yet, smart applications exist where the raw material is readily available as the result of land treatments and/or primary product creation. For example, co-generation within pulp and paper or lumber mills, schools or other government buildings in cold locations, all offer proven potential.

In terms of power generation, the most promising future approaches in order are 1) co-firing with coal at existing facilities, 2) complete "repowering" by abandoning coal or gas for woody biomass, and 3) stand alone options for remote, off-grid applications.

As an immediate result of the session, the USFS and Endowment will partner to advance torrefaction and pyrolysis technology from lab to field with demonstration field experiments aimed at rapidly assessing future commercialization potential. Outcomes include assessment of the potential for each to effectively advance (or disprove) in applied settings.

Woody Biomass Considerations: Policy, Supply, Technology

Policy – Utilities, Independent Power Providers (IPP), landowners, and all manner of businesses wishing to make long term investment are hampered due to unknowns regarding policy.

- Will a cap and trade policy be put in place that taxes carbon or coal? Such a tax would serve to rapidly advance biomass competitiveness. Except in certain more remote locations, natural gas and coal will continue to be more economical than most forms of biomass.

- There must be an inclusive definition of biomass. Multiple definitions are cloudy and convoluted, aimed at favoring some forms of biomass and disfavoring others. Agricultural interests don't want to compete with trees. Some environmental groups fear a devaluing of trees long-favored for aesthetics, wildlife, or other ecosystem services in

favor of plantations or management designed to supply biomass facilities. Yet, trees left on the ground after restoration release carbon and methane; overstocked, unhealthy forests often are subject to intense wildfires that lead to not only great loss of valuable wood resources but also serve to degrade watersheds and air quality while spewing large quantities of carbon dioxide into the atmosphere.

- Current policy provides greater incentives to solar and wind. Biomass, which works best within a distributive (e.g. fifty-mile radius) model, is disadvantaged.

- EPA regulations could treat biomass energy plants as "incinerators," leading to increased location and licensing obstacles.

- Co-firing biomass (including wood) with coal is a step toward renewable energy, but a policy decision will determine if this method is defined as "green energy," though the United Nations recently approved co-firing as a means of reducing carbon dioxide emissions. Questions also remain regarding the resulting chemistry of "fly ash" containing wood residue for continued use in cement and asphalt production.

- Stewardship contracting, a set of tools for managing public lands that currently allow for up to ten-year contracts in certain experiments, if made permanent, could facilitate investment in the use of biomass for both thermal and electrical power generation. Additionally, even longer-term contracts – 20 to 30 years – would provide important security to capital investments associated with plant construction and operation.

- Incentives for biomass such as bundled Renewable Energy Credit purchases by the government or "depots" for raw biomass would encourage market development.

Supply – Predictability in access, form, quality, and delivery are imperative.

- Green wood is essentially 50% water. Reducing the amount of air and moisture in wood at any point along the chain of handling from woods to power generation cuts down on costs. Options include torrefaction, in-woods drying, portable pellet making, chipping, traditional shavings/sawdust waste, etc.

- Every touch point adds costs: location, collection, transportation, storage.

- Like real estate, "location, location, location" will drive the adoption of biomass facilities. The high cost of transportation for a low-value, perishable product is a huge barrier. Haul distance alone is the largest single hurdle. Some biomass facilities use a rule of thumb that haul distance and plant size/output must be essentially equal – in short, maximum haul distance equals plant size, e.g. 30 miles/30 MW; 50 miles/50MW.

- Long-term contracts with near-to-market landowners, even private ones, could incent investments that rely on woody biomass. Ten years is the minimum; twenty to thirty year is desired. Yet, landowners are often reluctant to make long-term commitments to provide a certain quality and quantity of product. New forms of agreements that do not depend on "fixed price" contracts often desired by some power generators, may be vital to future growth.

- Index pricing does not exist for woody biomass, in part because a great deal of variation exists between species, region, etc. Creation of a woody biomass index (akin to NYNEX or Chicago Climate Exchange index/price for carbon) would allow transparency in markets and aid to leveling the playing field with coal – e.g. #1 coal is selling for $/ton. Some businesses currently improvise with pulpwood pricing as the biomass proxy using sources such as those generated by Forest2Market with differential adjustments for transportation, chipping, etc.

- Biomass aggregators may be necessary to simplify the supply chain for the power industry. Multiple suppliers, common to wood products mills, may prove too cumbersome for the energy industry.

Technology – Applying the most efficient and effective technology from woods to power delivery will bring costs down.

- Public and private partnering is important to more rapidly bring experimental technology into the field for testing and evaluation.

- Co-firing wood with coal is made easier with "bubbling bed" technology which allows for use of "dirty" wood and other types of biomass.

- Harvesting is one of the greatest costs: John Deere has made significant advances in efficient and safe harvesting.

- De-watering and densifying prior to transport cuts costs. Wood balers are becoming popular, especially in Scandinavian countries. Holding biomass bundles in woods for 90 days reduces moisture by 30%. A Patent is pending for a .U.S. manufacturer of wood baling equipment.

- Planting schemes could facilitate more efficient combinations of wood use. For example, one genetic seedling company is reportedly looking at "flex stands" – planted forest stands with alternating rows for traditional timber and pulp/energy.

- Gasification, torrefaction, drying trailers, and other methods to efficiently dry and convert wood to a usable energy form should be fully explored.

- Combined Heat & Power (CHP) is one of the higher efficiency/proven systems but only attractive in large scale applications such as prisons, schools, office complexes because the investment depends on predictable use and sustainability. Investors rarely view CHP in private sector applications as attractive due to inability to guarantee the underlying customer's (energy consumer) long-term viability.

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