

# Woody Crop Development

Northeast Sun Grant  
Regional Feedstock  
Summit Working Group



# Working Group Participants

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**1/3 million dry tons of wood  
(37 megawatts)**



## **Current best feedstocks in this category in the northeast and best source(s) of information for determining quantities**

- Unused annual growth & mortality in natural forests (USFS FIA) [34 million dry tons]
- Urban forestry trimmings, removals, & mortality (availability usually based on models).
- Energy Plantations on abandoned or marginal farmland (Census of Agriculture)

## **Top 3 most significant challenges to bring forest feedstocks to the energy market?**

1. Establishing estimates of feedstock costs & availability that address:
  1. Physical access costs & restrictions
  2. Public attitudes & policy limitations
  3. Competing demand for the feedstock
  4. Landowner awareness and capability
2. Establish 1<sup>st</sup> generation (heat) markets quickly to avoid losing forest management infrastructure.
3. Integrate biofeedstocks into existing forest products supply chain

# Energy Plantation Issues

- Extend the range of energy species.
  - Many more regional species and variety trials of willows & poplars are needed.
  - Breeding centers can produce new materials for testing by cooperators throughout the region.
- Increase yield and pest resistance through both traditional breeding and genetic engineering.
- Reduce plantation establishment, maintenance, and harvesting costs.



**What would be the cost (dollars, equipment, full time equivalent positions, time, etc.,) to adequately address the identified roadblocks?**

- Overcoming the problems identified will require funding for people much more than for things.
  - Inventories and surveys
  - Public outreach and landowner education
  - Geneticists, silviculturists, process engineers
- This suggests that recurring funding rather than lump-sum granting is needed.

## Final Thoughts

- First concentrate on using the vast surplus feedstocks in the Northeast's natural forests – but don't expect them to be “free.”
- Rapidly employ existing technology like CHP or District Heat systems.
- This stops the loss of infrastructure & buys desperately needed time for 2<sup>nd</sup> generation feedstocks & fuel technologies to emerge.
- This postpones making ethanol until tomorrow but it offsets petroleum and natural gas consumption for heat and electricity today.



## NE Feedstock Workshop – General Notes

Timber industry, in the NE, there is biomass rotting in different places. There is lots of data on forests available. It's an economic issue, woody biomass is an undervalued commodity, so it is important to develop markets where it is economically convenient to use what we have. For example: a regional hospital using recycled materials, saving half a million per year using biomass over natural gas, with the biomass system at the hospital 6.5 miles from a paper mill. Paper mills are upset, they do not want anything competing with wood chip availability. 40% of materials for fuel could be fines from the paper industry. Also, wood chips that are not good for paper mills could be used for biomass, but the systems for collection and use must be efficient. Ethanol plants could be implemented eventually, but the cost of materials is 50-60% of current costs. Emissions are simply treated, cyclones, data exists. What's missing: markets. Must be developed so that when biomass is produced, investment is justified. (equip etc) Promote small systems, but also need involvement from state (prison system). Utilize waste from timber management for biomass. Old strip mines = Pennsylvania prairie, thin timber, suitable for switchgrass, the land goes on for 5.5 mi, no idea how many acres. Need markets for biomass before cellulosic ethanol can be used.

Summary: Pointing out constraints of feedstocks being delivered to plants because of undervalued resources.

It's an infrastructure issue, no one is willing to go into the logging industry.

Native forest is a currently available feedstock.

Getting biomass from forests: Keep biomass round, need series of concentration yards. Can improve material by aging and seasoning, get moisture below 20%, better fuel. At 30,000 acres, maybe co op with other landowners, stage material, season for a summer, then go in with a chipper. Saw timber and polewood are easy to harvest, slash is harder to remove, should leave 5in layer for sustainability, not whole tree chippers. Aesthetics and forest management.

Concerns from small private landowners

1. Reluctant to pay for timber management, happy with knowledge, but unwilling to pay.

Can see first ten years of biomass, people won't put money on table without 50 year guarantee,

1. Arborists have millions of tons of chips they are paying to get rid of.

Technology exists, question of acceptance and markets.

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NE states should be looking at CHP, rather than liquid fuels right now. Can get started, then bring in other crops and do more, but need state policy to help. Prisons, schools are CHP.

Marginal lands in PA could start with SG, then move to a more traditional type timber, change condition of ground to get back to natural forests. Reclaimed strip mine, grows SG.

There's no good evaluation of ecotype or species for any regions, need to evaluate different varieties, conditions (environmental), know site specific recommendations, use natural forest, need to cycle resources, could introduce genes for new varieties.

Demonstrate yields around the country. Poplar and willow are planted by cuttings, aspen does not root, combining these could yield more biomass with more resistance to disease. Combine two natives, trait from one, improve the other.

Develop new technologies for harvesting woody biomass, trying feedchopper, must do cooperatively because of cost of equipment, must be more robust to deal with woody crop. Need to improve biomass gathering in forests. Canadians use a two step system. Siting the biomass is a big issue as well. Harvesting systems are a big element. What a ton of biomass produced in an energy plantation is going to cost versus natural forest systems

Integrated harvesting systems, produce materials in a systems approach, integrate energy plantation, grow material big enough to grow one other product from. Distributes cost of processing and harvesting. Might be better to have production systems with multiple products rather than one crop.

Riparian buffers: become wet sponges for nutrients. If you can harvest that material (put crops along buffers and use nutrients) you can squeeze out the sponge. Time harvest to develop root system while using nutrients. Potential benefit of feedstock production: nutrient cycling.

If price can't be guaranteed for a long time, investors won't pay up. Want to know price of feedstock 20 years from now. No futures market in wood. There is no broker that says we'll deliver for thirty years. No guarantee on energy costs, so investors are wary.

In Minnesota, NY and PA, utilities must guarantee some form of renewable energy. Need to link what they are buying to what they are able to sell for. There needs to be some certainty in system. Can create financial models based on guarantees. Most forest products industries go out and negotiate individual contracts. Need to get private companies involved.

Need to change from piggyback on timber ind and move to dedicated energy ind. Timber ind, provides infrastructure but also competition. Need to borrow a bit of timber ind, rather than be timber ind and turn it into energy ind. Need to invest in infrastructure, storage. Biomass changes with weather and season. (Hunting season for example)

Reflections at end of session:

Who are you in competition with for woody biomass? It's being bought here in NY and shipped to Poland, so mind global market. If industry is not created here, resources will be exported. Competition is not just neighbor, state or other region, need to consider global markets

Process efficiencies. Vermont estimates 600,000 tons per year for firewood, least efficient way of generating heat, a CHP operation could get 60 – 70% eff off same amount of wood. Home firewood is maybe 10%. Need to integrate across entire value chain in forest industry. For every tree cut, get every high value product possible. How can we integrate everything to get as much as possible out of it?

What are the mandates going to be, sequestration credits for carbon sinks on forest lands?