

Short Rotation Woody Crops Note Summary
Day 2 Break Out Session
August 2, 2006

Focus: Plan for the contribution of short rotation woody crops (SRWC) towards production of 60 billion gallons of transportation fuel by the year 2030.

Co-chairs :

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Participants:

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John Burke, VA For. Assn.

Mark Coleman, USFS

Kevin Craig, DOE

Larry Dawley, Greenstock Res.

James Eaton, Potlatch

Thomas Fox, Virginia Tech.

Don Riemenschneider, USFS

Thomas Scott, Informa Economics

James Shepard, MSU

Michael Tschantz, Mead/West VA, Co

Timothy Tschaplinski, ORNL

Timothy Volk, SUNY

Edwin White, SUNY

What are important topics that need to be addressed in SRWC?

Each participant briefly described the topics that they believe is an important topic to address in developing transportation fuel from SRWC. However, due to the time constraint, there was no further discussion on each topic.

- Need environmentally-acceptable cisgenic/transgenic woody crops
- Implementation schedule (not only the plantation but also for the industry)
- Economics of landowner decisions
- Regionalization of feedstock/Long-term support for crop development
- Production physiology growth/field trials
- The message of not-dollars-for-time.
- Cost competitiveness of woody crops for biofuel/Demonstration of facility
- Can woody crop cost less than \$35/ton? Is it price competitive? (double harvestable yield, shorten rotation). Capture the prices of bi-products and woody crops.

- Consideration of macroeconomic events that will impact the microeconomic feasibility. What is right with the commodity crops?
- Sustainability of short rotation woody crops/Capture the economic benefits
- What's going to happen downstream? Is it profitable? Demonstrate in a model how the profitability can be achieved.
- Landowner's perspective: Diversify product mix. Transportation fuel is not the only product.
- Thinning of southern pine meets the near-term requirements of feedstock availability (~20 ton/acre production at the end of the 20-30 year rotation, low cost/unit production, etc.); Regional project needed to be supported by DOE; Commercial demonstration is needed.
- Research support in high yield dedicated energy crops
- Ethanol production by 2012 (CHP project). Need a goal for the ethanol production amount.
- Environmental benefits of growing short rotation woody crops. Need for a stable funding source for R&D (a creative way to finance?)

Mark Decot: Two important topics that must be discussed are Demonstration Plan and Economic Production

What are major advantages of using short rotation woody crops for making transportation fuel? (P=Process Benefit; E=Environmental Benefit)

Participants wrote the advantages of using SRWC for making transportation fuel on index cards. Each advantage was displayed in index cards for others to see, and with the facilitator's assistance, the list was grouped under two main advantages of SRWC, which are process benefits and environmental benefits. There were several advantages that participants believe provide both process and environmental benefits at the same time.

- Provide diversity of feedstocks to make ethanol (P/E)
- Location and geographic advantages/distributive advantages (P/E)
- Handling sustainability (P/E)
- Genetics diversity (P/E)
- Lower input crops (P/E)
- Genomic resources available for rapid crop improvement

**More complicated issues

- Potential for Long-term supply contract (supply chain perturbed)
- Opportunity in woody crops is not realized
- Production meeting environmental goals.
- Potential for agricultural system
- Transformation Efficiency

I. Process Benefits

Adaptability of species to regional areas -

- Lower ash content (especially Si)

- Year-round availability
- Stable, consistent feedstock supply
- Easy to store
- High density products
- Mix with the other woody feedstocks
- Potential for significant yield improvement through cultural management and genetic engineering

II. Environmental Benefits

- Lower inputs of fertilizer and pesticides—lower carbon inputs
- Protect water quality
- Protect air quality
- Fully sustainable production systems
- Sequester carbon
- Reduce soil erosion
- Create wildlife habitat
- Vegetative propagation
- Increase landscape diversity
- Improve biological diversity
- Increase soil carbon levels
- Improve soil microorganism/arthropod diversity
- Usage of marginal farmland into production

How much could this pathway contribute to meeting the 60 billion gallon goal?

Assumptions:	55 million acres 5 -10 dry tons /acre/year 65-90 gallons/dry ton
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With the assumption agreed upon by participants, the conservative production estimate by 2030 was **18-50 billion gallons of ethanol** from perennial crops. This includes woody crops and herbaceous perennial crops.

The short-term goal for year 2013 was to produce 250 million gallons. It should be noted that this is a total goal; the goal of woody crops is 125 million gallons by 2013.

The issues of the number of pilot scales/demonstration plans (may be 8?) as well as a smooth rational growth plan for ethanol production were raised to achieve the production goal.

At what cost must biofuel be produced to be competitive with gasoline?

Assumption:	6 dry tons/acre/year 90 gallons/dry ton \$50 stumpage rate
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With the assumption agreed upon by participants, the price of feedstock to produce cellulosic ethanol from dedicated crop was estimated \$35-\$80 /dry ton (including southern pine).

Short rotation woody crop net feedstock cost: \$0.50 to \$0.90 per gallon
Today's market value is \$0.60-\$0.65

Ethanol from woody crops target cost: \$1.50 to \$1.75 per gallon (*It does not include other by-products)

What policies would help to achieve cost competitive biofuel from woody crops?

This is a continuation of discussion that started on the day 1 session. Participants agreed that there were short-term and long-term policy needs by year 2012 and by 2030 respectively. In addition, the policy was grouped under demand policy and supply policy that address different needs on supply and demand side of the SRWC.

- Specialized Woody Crop Energy Fund
- Landowner Assistance and Incentives
- Annual payment to landowner for SRWC
- Sustained R&D
- Consistent market for products
- Legislation that encourages products of SRWC for bio-refineries
- Restart BFDP (Biofuels Feedstock Development Program)
- Policy-market interaction
- Alternative to Farm Bill
- Balance between demand policy and supply policy
- Carbon credits
- Net metering policy¹
- Renewable Fuel Standards (RFS)

Year 2012

- Demand policy
 - Provide consistent market for product
 - Carbon credits
 - Net metering policy²
 - Renewable Fuel Standards (RFS)
- Supply policy
 - Landowner Assistance and Incentives
 - Annual payment to landowner for WC
 - Legislation that encourages products of SRWC for bio-refineries
 - Restart BFDP (Biofuels Feedstock Development Program)
 - Support for CRP Land Use

Year 2030

- Sustained R&D
- Consistent, sufficient long-term R&D
- Congressional Long-term Commitment
- Higher blender credit
- Higher mandated level of cellulosic ethanol

¹ Net metering enables customers to use their own generation to offset their consumption over a billing period by allowing their electric meters to turn backwards when they generate electricity in excess of their demand, <http://www.eere.energy.gov/greenpower/markets/netmetering.shtml>

² *ibid*

What synergies do solutions for this pathway have with other pathways?

- Commonality with the feedstocks in natural forest products
 - Seasonal harvest compatibility to ensure continuous supply
 - Diverse feedstock
- Infrastructure compatibility with forest residue and forest feedstock
- Conversion technology –feedstock dependency
- Scale-up compliments to other feedstocks
- Ecological services to other feedstocks
- Policy needs (tax incentives,..)
- Other usage of woody crops
- Geographic compatibility

What conflicts exist between pathways which may inhibit their ability to meet the program's targets?

- Limited Farm Bill appropriation for woody crops
- Competition of stumpage price
- Environmental opposition
- Effective cost comparisons
- Land use
- Competition for other usages of the feedstocks and resources
- Allocation of the 30x30 target
- Available R&D funds

Suggestions/Comments

- Note taking in the report-out presentation session
- More time to prepare for the meeting/presentation
- Integration of expertise across the routes
- We had a remarkable outcome considering the diversity of the group.

Parking Lot: Limit Litigation in Federal land use case (need to provide policy-level assistance)