

Report Out 2: Forest Resources— 2030 Target

Forest Resources Co-Sponsors

Paul Grabowski

Steve Kelley

Facilitators

Roy Tiley

Itir Keskiner

Attendees

Richard Bain	Craig Lenocker
Michael Brower	Lisa Myers
Craig Brown	Jim Presswood
Marilyn Buford	Kathy Radigan
Vann Bush	Alan Rudie
Dan Burciaga	John Scahill
Robert Campbell	Craig Scott
David Canavera	Thomas Scott
Mary Fischer	Tommy Smith
Sally Hampton	Ben Thorp
John Hansen	Ted Wegner
Jennifer Holmgren	Robert Wimmer

30x30 Workshop |

A Scenario for Supplying 30% of 2004
Motor Gasoline with Biofuels by 2030

Biomass

Forest Resources: Definitions

Cellulosic Ethanol Definition: lignocellulosic;
plant; trees; hemicellulose

Biofuel Definition: renewable biomass;
plants and animals; fuels, power and heat;
sustainable and gaseous

Forest Resources

- Early deployment with feed collection, costs, (storage), plants, workforce, permits, water
- Options that do not require cellulase enzymes
- Community support and maintain rural economy

30x30 Workshop

Forest Resources: 2012 Volume Targets

Biofuel Type	Process	2012 Volume Target
Ethanol	Fermentation 2 options, 12-14 plants	100 million gallons/year
Diesel/Jet Fuel	Gasification 2 options, 4 plants	75 million gallons/year
Diesel/Gasoline	Pyrolysis 1 option, distributed	1.4 million gallons ethanol equivalent/day

30x30 Workshop

Forest Resources: 2012 Cost Targets

Biofuel Type	Process	2012 Cost Target
Ethanol	Fermentation with coproducts	50% below current market price of Ethanol
Diesel/Jet Fuel	Gasification	\$1.50
Diesel/Gasoline	Pyrolysis	Less than current \$2.00 cost

30x30 Workshop

Forest Resources: 2030 Volume Targets

Biofuel Type	Process	2030 Volume Target
Ethanol	Fermentation	4.8 billion gallons/year
Diesel/Jet Fuel	Gasification	7 – 20 billion gallons/year
Diesel/Gasoline	Pyrolysis	Ref. UOP/DOE study

30x30 Workshop

Forest Resources: 2030 Cost Targets

Biofuel Type	Process	2030 Cost Target
Ethanol	Fermentation	Depends on coproduct market dynamic
Diesel/Jet Fuel	Gasification	\$0.80
Diesel/Gasoline	Pyrolysis	

30x30 Workshop

Forest Resources: Research and Development Needs for 2012

- Technoeconomic analysis of integrated, available technologies
- Improved pyrolysis oil production and conversion technology
- R&D for integrated gasification process
- Demonstrate mixed sugars fermentation

30x30 Workshop

Forest Resources: Policy Needs for 2012

- Production Tax Credit (2008)
- Focused RFP on Forest Resources
- Gov. Funding for Pilot Demo Plants (2008)
- More efficient, better federal and state coordination of permitting

30x30 Workshop

Forest Resources: Synergies

- Forest products industry leads the development of Lignocellulosic feedstocks (herbaceous or woody crops) (only need C-6, C-5 fermentation technology & have capital in place)
- Agricultural & Herbaceous Energy- we can use some of them. Also, some common R&D needs
- Agricultural & Woody Energy- Fermentation Technology
- Simultaneous C5/C6 sugar fermentation
- Forest Biorefinery – Woody Perennials – Upgrade the generic quality of planting stock through tree breeding & biotechnology
- Feedstock Woody Energy Crops
- Need for Information/work force development
- Corn wet dry mills – Lignin => Py oil => gasoline
- Cellulose => Ethanol
- All in E85
- Certain policy needs – i.e. incentives/tax credits
- Woody Biomass Energy Crops can extend the forest biorefinery supply chain – woody short rotation crops-willow
- Gasification/Pyrolysis products fit into existing fuel delivery infrastructure
- Suitability of conversion technology to wide range of feeds/pathways
- Corn Wet Dry Mills – Bottom line metric consistent with policy and relevant economic metrics
- Need better rail transportation
- A level playing field for all suitable renewable fuels
- Water usage/consumption issues

30x30 Workshop

Forest Resources: Conflicts

- **Land Conflict w/Herbaceous and woody crop to grow saw-logs**
- **Infrastructure – lack of emphasis on trees/forests, too much focus on corn**
- **Agricultural Residues – ethanol/corn stover centric**
- **Saturation of Energy coproducts markets – corn, oils**
- **Produce hydrocarbon fuels on equal footing with ethanol**
- **Corn/Wet dry mill – policy protection from competition with CTL**
- **Competition for R&D dollars**
- **Environmental performance standards for renewable fuels**
- **Tree-biomass has existing harvested handling systems more cost effective & existing conversion facilities**