

Think Green, Buy Green: Energy from Biomass

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Today's Roadmap

- **About EOFC**
- **Aiming Higher**
- **Road Blocks**
- **Why Biomass?**
- **Why Thermochemical?**
- **Why Transportation Fuels?**
- **A Systems Approach**
- **What Is Needed**
- **Who Can Do It**

Will Address

Executive Order 05-46

- **Lessen Missouri's dependence on fossil fuels**
- **Develop alternative fuels while strengthening farm economy**

About EOFC

- **Public corporation, 501c3 pending**
- **14 southeastern counties**
- **Private landowners, resource managers,
forest industry leaders**

EOFC's Objectives

- **Promote sustainable forestry**
- **Foster rural development**

EOFC's Program

- **Landowner education**
- **Mechanized logging**
- **Bioenergy**

U.S. Needs to Aim Higher

- **US: 25x'25 – 25% of all energy from renewables by 2025**
- **Brazil: now energy self-sufficient; subsidy-free**
- **Sweden: 26% of energy from renewables in 2003; oil-free economy by 2020**

- **Vehicle mileage – fleet averages:**
 - **US: 26 mpg, peaked in 1987!**
 - **Europe: 42 mpg today**
 - **Japan: 47 mpg today**

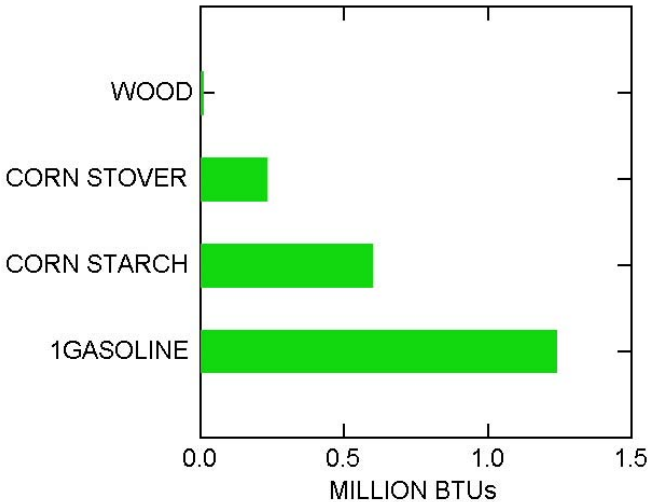
Road Blocks

- **Ineffective national energy policy**
- **Focus on inefficient or developed technologies**
- **Inadequate subsidy of emerging technologies**
- **Bureaucratic inertia**

***State Governments and Agencies
Must Take the Lead***

- **Biomass fuels are produced more efficiently**
 - **Free solar subsidies – decades for wood vs months for corn starch**
 - **Reduced energy inputs**
 - **Corn requires much nitrogen whose manufacture is energy-intensive**
 - **drying mash uses 20% of energy in conventional corn-to-ethanol plant**

ENERGY TO DELIVER 1 MILLION BTUs TO FUEL TANK



- **Large potential for farm-based production of biomass-derived energy in Missouri**
 - **Current corn-to-ethanol plants are producing 110 million gal/yr, or 8.5 trillion BTU/yr**
 - **Estimated potential for grain ethanol production is about double this**
 - **Crop residues and sustainable forest thinnings (~50:50) contain 169 trillion BTU/yr**
 - **Assuming 30% conversion gives 51 trillion BTU/yr**

***Biomass has 3X the potential of
corn starch for ethanol production***

Why Thermochemical?

- **Faster**
- **More energy-efficient**
- **Better handles cellulose**
- **More flexible feedstock requirements**

Why Transportation Fuels?

- **96% of US petroleum use is for transportation**
- **64% of US petroleum use is imported**
- **Major US auto-makers told Congress that ethanol is quickest path to increased energy self-sufficiency**
- **Huge market exists now**

Essential Systems Approach

- **Which first – E85 fuel or vehicle development?**
- **Jo Ann Emerson's answer – both!**
- **GM makes nine flex-fuel models in Brazil, accounting for 95% of its vehicle sales**
- **E85 availability is the bottleneck in US**

- **Co-development of biofuel technologies**
 - harvest
 - transportation
 - processing
 - distribution

- **Supply levelization**
- **Combined services for forestry operations**
- **Third-party certification of sustainability**
- **Public education**
- **Level playing field**

What is Needed

- **Leadership**
- **Full-time “true believers”**
- **Education re: potential of biomass (MO brochure)**

- **Grain ethanol, soy biodiesel, and wind turbines are well-developed, highly profitable technologies so**

- ***Shift public subsidies to emerging technologies***
 - **Increase renewable energy input to existing biofuel production (Minnesota corn ethanol plant converting from propane to wood)**
 - **Develop prototype, biomass-based Bioenergy Park in Ozarks (gasification and torrefaction of forest and crop residues)**

- **Via co-investment and legislative mandates, not tax credits**

LEADERSHIP *LEADERSHIP* *LEADERSHIP*

Who Can Do It?

- **All of us, but especially**
 - **Missouri Departments of Agriculture, Conservation, and Natural Resources**
 - **Legislators under the leadership of the Governor's Office**
 - **Farmers' groups**
 - **EOFC in partnership with UMR's Engineering Dept**

