

# Ethanol from Biomass

America's 21<sup>st</sup> Century Transportation Fuel

Submitted to

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A Proposal of the



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### ***Pre-Proposal***

The Governors' Ethanol Coalition is submitting this pre-proposal requesting \$75,000 for the development of a comprehensive initiative to improve the economic viability and enable commercialization of ethanol production from biomass resources.

### ***Background***

The Governors' Ethanol Coalition believes that the nation's dependence on imported oil is a major risk to the nation's energy and economic security. Probably the safest and cheapest way to mitigate this risk is to produce a greater portion of the nation's fuel requirements using our own renewable resources. Ethanol has the potential to replace a major portion of U.S. gasoline consumption, but realizing this potential will require expanding ethanol production to include lower-value, higher-availability lignocellulosic biomass feedstocks like grasses, straws, waste wood and paper, corn stover, sugar processing co-products, and other agricultural processing residuals. Although technically feasible via numerous thermo-chemical and biological processes, lignocellulose conversion to ethanol on a commercial scale depends on improving conversion process economics.

The Coalition believes that establishing ethanol as a major transportation fuel will require the development of commercially viable methods for producing ethanol from all types of cellulose-based feedstocks. With commercial applications-targeted research, a stronger policy focus, and effective legislative and policy initiatives and incentives, ethanol can significantly replace petroleum from the Mideast and other unstable regions over the long-term.

Extending the volume of conventional gasoline is a significant end use for ethanol, as is its use as an oxygenate in the reformulated gasoline program. To succeed in these markets, the cost of ethanol must be close to the wholesale price of gasoline, currently made possible by the Federal ethanol incentives; however, the incentive is due to expire in 2007. The incentive has been extended in the past but in order for ethanol to compete on its own merits the cost of producing ethanol must be reduced substantially.

The production of ethanol from corn is a mature technology. Significant cost reductions are achievable with the use of cellulose-based feedstocks instead of corn or grain sorghum. Although not economically competitive today, advances in biotechnology and thermo-chemical conversion processes will decrease the cost of ethanol production from biomass. Based on current development status, the Coalition believes that the cost of producing ethanol could be reduced by as much as 60 cents a gallon by 2015.

The ability to produce ethanol from low-cost biomass is essential to making ethanol competitive with gasoline and significantly displacing imported petroleum. The benefits to the nation of using ethanol to displace petroleum are clear:

- ***Economic Growth***

Developing a strong biomass ethanol industry in the United States will have tremendous economic benefits including trade deficit reduction, job creation, and strengthening of agricultural markets. Growth of biomass industries can create new markets and employment for farmers and foresters, many of whom currently face economic hardship.

- ***U.S. Trade Deficit and Oil***

In 2003, the United States imported nearly \$130 billion of energy-related petroleum products, which accounted for over 25 percent of the \$490 billion total U.S. trade deficit in goods and services. The nation's dependence on oil has resulted in the transfer of \$1.16 trillion to oil-producing countries over the last three decades. This transfer of wealth is expected to continue as the nation's foreign oil dependency increases. The U.S. Department of Energy estimates that each \$1 billion of trade deficit costs the nation 27,000 jobs. In 2003, the importation of foreign petroleum products cost the nation 3.5 million jobs.

- ***U.S. Military and Oil***

U.S. dependence on oil supplies and production facilities concentrated in the Persian Gulf make defense of this area a high priority for the U.S. military. While there is no doubt that a portion of the U.S. military budget is used to protect access to Persian Gulf oil, the magnitude of this value is difficult to determine. Analysts' estimates for the cost of maintaining an uninterrupted flow of oil from the Gulf region vary widely, from less than \$0.5 billion to \$70 billion annually. Producing ethanol from renewable, domestically supplied biomass presents an opportunity for the nation to reduce the costs associated with protecting Persian Gulf oil interests.

- ***Oil Supply Disruptions and the Economy***

The Arab oil embargo, Iranian Revolution, Persian Gulf War, and the Iraqi invasion of Kuwait resulted in oil supply disruptions and subsequent oil price hikes followed by economic recessions. Over the last 30 years, oil dependence — including price hikes during supply disruptions and the transfer of wealth — has cost the nation \$3.4 trillion, according to the U.S. Department of Energy. Biofuels production cannot eliminate dependence on foreign oil, but the greater the biofuels production, the less the dependence and the better the nation can respond to oil supply disruptions.

- ***Public Health Costs and Oil***

Transportation is the nation's largest single source of air pollution. Consequently, enormous hidden public health costs come with the transportation sector's use of oil. Reducing the amount of petroleum fuel used and replacing it with cleaner-burning ethanol will decrease air pollution and related public health costs.

- ***U.S. Agricultural Economy and Biomass***

Growth in the ethanol industry creates domestic jobs through plant construction, operation, maintenance, and support — mostly in rural communities. The ethanol industry has grown to 74 plants in 19 states, which support 214,000 jobs in the nation, mostly in rural communities. The construction of 15 plants (or 550 million gallons of capacity) is planned for 2004. On average, each ethanol plant supports 41 full-time jobs and nearly 700 jobs throughout the entire economy. This has a profound impact on rural America where a decline in employment has placed increasing burdens on our cities, infrastructure, and tax base. James Woolsey, a member of the National Commission on Energy Policy, has estimated that by using only the current inventory of CRP lands and without taking any land out of food production or adding marginal lands, it is theoretically possible to produce enough biomass ethanol to replace 20 percent of the oil the nation uses for transportation — at current fuel efficiency and SUV ownership rates. Adding rice straw, corn stalks, and other agricultural residuals would raise the replacement ratio to 33 percent, which equals almost 60 percent of the nation's total import volume.

Reducing the transportation sector's reliance on oil is clearly the key to improving the nation's energy security, economy, and environment.

***Initiative***

*Ethanol from Biomass: America's 21<sup>st</sup> Century Transportation Fuel* is a comprehensive initiative to increase the production and use of biomass ethanol.

Technologies presently at the research and development stage are expected to be competitive in the future. However, one way of helping them achieve this transition sooner in the United States is through the adoption of supportive policies and market-based incentives. These policies and incentives can help increase the role of biomass in the U.S. — the benefits that are linked to vital factors in the continuing stability of America: the economy, environment, and energy security.

The Governors' Ethanol Coalition, in collaboration with the Hewlett Foundation, can accelerate the increased use of biomass for the production of ethanol by identifying legislative and policy initiatives needed to stimulate the market for biomass-based ethanol by addressing the following two primary questions:

- *Why is the production of ethanol from non-grain feedstocks necessary?*  
Examples of the areas to be examined are job creation, rural economic development, energy security, homeland security, the environment, and production feedstocks and technology.

- *What will it take to make the production of cellulosic ethanol a reality?* The answers to this question will identify research, legislative, fiscal, and policy initiatives needed to enable commercialization of biomass-based ethanol.

***Process***

The Coalition will retain a coordinator to assist with this project.

Within 30 days of approval of this pre-proposal, the Coalition will convene a Working Group meeting in Washington, D.C., with about ten participants with knowledge of biomass technology and policy initiatives. The purpose of the meeting will be to develop the broad outline of legislative and policy initiatives and to begin coordinated legislative development and policy justifications. This series of three meetings would include, for example, representatives or researchers from the National Commission on Energy, Senator Daschle's office, Senator Lugar's office, Governors' Ethanol Coalition, Hewlett Foundation, and the California Energy Commission.

In preparation for each of the Working Group meetings, the coordinator under the Coalition's supervision will:

- conduct a literature search and collect all policy and program materials on ethanol biomass and bioenergy such as current federal and state purchase requirements, current U.S. Department of Energy and U.S. Department of Agriculture programs, tax incentives, other grant and loan programs, research and development activities, including those research activities focusing on cellulosic activities and those activities that could be modified to enhance cellulosic feedstocks;
- identify experts who could address the first primary question of *Why is the production of ethanol from non-grain feedstocks necessary?* Examples include land grant universities that could address rural economic benefits and job creation and experts who could address homeland security, energy security, environmental issues, and production feedstocks and technology;
- assemble a list of straw man policy proposals that promote cellulosic ethanol;
- begin a list of technology, research, production, and policy justifications or gaps that will need to be addressed or developed in subsequent work;
- assemble the above material into a briefing packet for use by Working Group members;
- present during each meeting the findings on current policies, proposed policies, and gaps identified by the experts and Working Group members; and

- prepare Draft Recommendations that contain proposed policies and future study and research needs as a result of the Working Group meetings.

The Working Group will discuss proposed policies and will reach a consensus on one or more policy initiatives and future research and advocacy needs.

The Draft Recommendations will be shared with all members of the Governors' Ethanol Coalition and with interested stakeholders to elicit comment. After review of those comments by the Working Group, the coordinator will prepare Final Recommendations.

The Coalition will require public review and comment of draft materials, consistent with the timetable adopted, including review and comment by leading environmental organizations. Throughout the process, the Coalition will encourage open and public debate of the issues associated with the project.

The Coalition will publicize developments in the progress of the project as appropriate and will continue to inform the public about the project and its importance to the nation's energy future. Venues for the public announcements include but are not limited to formal meetings of the Governors' Ethanol Coalition, National Press Club, National Governors' Association, news conferences attended by the Coalition chairman, vice chairman, or member governors. When schedules permit, one or more governors will be invited to participate in related news conferences such as those of the National Commission on Energy Policy.

It is expected the start of public awareness of this initiative will occur throughout the preparation period. During this time, the governors will be encouraged to discuss publicly the importance of the project in their own states and nationally, and will encourage participation in the plan development, thereby increasing the public acceptance process.

### ***Timeline***

It is expected that the Recommendations can be completed within 120 days after the requested funds have been committed to this project and the coordinator retained.

### ***Planning Grant Deliverables***

Within 120 days of receiving the planning grant and retaining the project coordinator, the Coalition will deliver the Final Recommendations that will include a detailed budget and timeline that will describe the development of follow up activities.

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Pre-Proposal Budget***

Washington, D.C., Working Group Meetings at Hall of States (three meetings planned)	
Travel costs for 10 participants (airfare, lodging)	
\$10,000 per meeting .....	\$30,000
Coordinator Contract Costs (at \$100/ hour)	
Preparation of identified meeting materials and preparation of	
Final Recommendations and other work as assigned (300 hours).....	30,000
Meeting preparation and logistics (20 hours)	
\$2,000 per meeting.....	6,000
Meeting Follow Up (20 hours)	
\$2,000 per meeting.....	6,000
Communication / Miscellaneous Costs .....	3,000
Total .....	\$75,000