

Mr. Chairman and Members of the Committee:

I want to thank you for having the vision and the leadership to hold this hearing. Each morning when we pick up the newspaper and read about the latest terrorist attack in Saudi Arabia, Spain, Pakistan, or elsewhere, we're reminded of the volatility of this post-9/11 world of ours - and of the urgency of finding ways to reduce our dependence on Middle East oil.

It is a challenge directly linked to the security and well-being of our nation: to find new technologies, new efficiencies, and new natural resources that will enable us to produce more of the energy we need at home, and do so in ways that are positive for the environment and that may also be adopted by less prosperous nations. The nation's agricultural sector is uniquely positioned to respond to this challenge and to benefit from the opportunities it presents.

I am presenting these views on behalf of the Energy Future Coalition, for which I serve on the Steering Committee. This is a broad-based, independent and bipartisan initiative that seeks to address three great challenges that are directly tied to the production and consumption of energy:

? The security threat posed by the world's, and our own, dependence on oil.

? The lack of access of the world's poor to the reliable and affordable energy supplies they need to help themselves out of poverty; and

? The risk to the global environment from climate change, stimulated by over-reliance on fossil fuels.

Our coalition has worked to move beyond the predictable clashes of interests and parties. Instead, we've focused on emerging technologies, on market solutions and on both immediate and longer-term approaches that will carry us to a new, sustainable energy economy.

In recent years, U.S. energy policy has been gridlocked. We've failed to adequately address the risk to our economy, our environment and our security that stems from our dependence on oil. Oil market upheavals since 1973 have stunted the growth of the U.S. economy - by a net 10 percent of GDP, according to energy economist Philip Verleger. The question we must address today is how best to hurry along what we now recognize must be an inevitable shift in our primary energy supply.

About a quarter of the total energy consumption in the United States is for transportation, which depends almost entirely on oil. Transportation consumes roughly two-thirds of the oil we use, nearly 60% of which is imported. So if we are to move away from dependence upon imported oil, we must change the transportation sector.

We can do that, starting today, by creating and sustaining public policies that encourage a transition to cleaner and more fuel-efficient vehicles and by investment in large-scale initiatives to produce biofuels as an alternative supply source. In the process we can increase farm income and reduce the cost of government support payments, as new markets for agricultural materials steadily lift the demand for farmland and provide new revenue streams to farmers for products now thought of as "waste."

Bioenergy - growing our way out of dependence upon foreign oil - offers our country an opportunity to protect itself by doing the right thing: aiding our farmers, the environment and the nation's energy security. It also can help resolve global trade deadlocks that center on whether our support for agriculture in this country undermines the rural poor in the rest of the world.

This is not a scenario based on technological expectations that will take shape a half-century from now. Two weeks ago, a Canadian company, Iogen Corporation, announced that it had begun the commercial production of ethanol from cellulose, in the form of wheat straw - a global first. Iogen reported that it and its partners had already invested \$110 million (Canadian) in this technology, of which the largest share, \$46 million, came from Shell. Shell in turn predicted that "the global market for biofuels such as cellulose ethanol will grow to exceed \$10 billion by 2012."

New biotech advances can enable the use of corn stalks, wheat straw, rice hulls, grasses and other "waste" products to be the new crude for "biorefineries." Starch from corn and other grain crops has been the principal feedstock for ethanol production and will continue to be for some time. This pathway has been an essential first step toward developing an ethanol infrastructure, and government support for continued growth of the industry is vital as a bridge to the future. The efficiencies of crop production and ethanol conversion continue to increase.

Using cellulose will increase the amount of ethanol that can be produced from grain because more of the plant will be used. Obtaining energy and other products from cellulose also avoids the consumption of food crops for industrial applications. Thermochemical processes have the potential of converting a still wider range of biomass feedstocks, including abundant animal wastes and sewage, to clean renewable fuels - even gasoline.

Starch-based ethanol has limited benefits in terms of oil displacement and greenhouse gas emissions, due to the substantial fossil fuel inputs required to grow grain and convert it to alcohol. The benefits of cellulose conversion are dramatically larger; indeed, a conventional internal combustion engine operating on cellulosic ethanol produces fewer greenhouse gas emissions on a life-cycle basis than a fuel cell operating on hydrogen derived from fossil fuels. The use of sustainably produced bio-derived fuels and products contributes little in the way of net greenhouse gas emissions because the carbon dioxide released during combustion is offset by the carbon dioxide absorbed by the biomass as it is grown.

There would be also a significant air quality benefit from the increased use of biofuels, at a time when much of the country is having difficulty complying with new ozone standards, by reducing gasoline aromatics, such as benzene, toluene and xylene. These materials are highly toxic, the largest single contributors to fine-particle pollution, highly photochemically reactive to sunlight (and thus large contributors to ozone), hard on catalytic converters, and the most carbon-intensive portion of a gallon of gasoline. The health benefits alone of eliminating these air toxics potentially run to billions of dollars.

The potential contribution of biofuels to our energy supply is quite large. A study for the Energy Future Coalition by the Battelle Memorial Institute produced a near-term scenario in which 50 billion gallons of cellulosic ethanol could be manufactured annually, without a significant disturbance to our agricultural economy. (This compares to last year's record production of nearly 3 billion gallons of ethanol from corn and overall U.S. consumption of more than 110 billion gallons of gasoline.) A [copy of this study](#) is attached for the record.

Large-scale demand for ethanol feedstocks would also raise prices of other crops, both here and abroad. Economist William Cline of the Center for Global Development and the Institute for International Economics estimates that U.S. production of 50 billion gallons of ethanol would have the indirect effect of lifting more than 40 million people out of poverty in the

developing world. In the U.S., a new domestic fuels industry would be a major economic stimulus to the rural economy, creating new jobs, increasing farm income by billions of dollars, and reducing the need for government support. It would also make a dent in our enormous trade deficit: Fully one-quarter of our \$489 billion imbalance of payments is attributable to petroleum.

A substantial shift to biofuels would also have a significant benefit for our national security. In response to a request by Dr. Andrew Marshall, Director of Net Assessment in the Office of the Secretary of Defense, the Arlington Institute last year produced a report entitled "[A Strategy: Moving America Away from Oil.](#)" A summary is attached for the record. In short, the report recommended a three-step strategy for the nation:

1. Vast improvements in efficiency must be made, mainly through hybrid gasoline-electric vehicles and new lightweight designs.
2. The U.S. should invest in a new large-scale initiative to produce biofuels as an alternative supply source, mainly through cellulosic biomass.
3. In the longer term, these biofuels can be used as a feedstock for fuel cells.

So what needs to happen next?

Congress should create a well-focused program to make bioenergy a low-risk commercial option, funded at a level that reflects its value to enhanced national security, trade and the environment. We recommend that the Federal Government authorize and conduct a one-time procurement "fly-off," aimed at building 5 to 10 commercial-scale demonstration plants over five years to test the viability of different conversion processes, using different resources and producing different end products. The risks of this kind of scale-up are substantial - beyond the scope of the private sector to manageably finance alone - but the benefits of success are far larger. The Department of Defense is well suited for this sort of competitive technology demonstration program.

Second, federal expenditures for bioenergy research and development need to be increased to reflect the magnitude of the problem - in national security terms. Thanks to Senator Lugar's leadership, Congress passed and the President signed in 2000 the Biomass Research and

Development Act to establish an intensive and focused national R&D program - authorizing \$245 million over five years. But this additional money hasn't been appropriated.

Once the technology for the conversion of biomass to fuels is well demonstrated, financial incentives may be needed to stimulate production and ensure a fair return to farmer until demand becomes reliable and profits can be fairly certain. We recommend that the National Research Council assess the impacts of shifting domestic farm subsidies from food and fiber crops to conservation, energy crops, and the bioenergy industry and report back to Congress. This report would evaluate the effect of such action on energy supply, national security, and the environment, as well as on economic conditions in rural America and the developing world.

Mr. Chairman, the [full report](#) of the Energy Future Coalition contains additional recommendations, and a summary of that report is attached for the record. The Coalition's Bioenergy and Agriculture Working Group was ably chaired by Brent Erickson, Vice President for Industrial and Environmental Biotechnology at the Biotechnology Industry Organization.

In our judgment, these and other well-considered steps can hurry this country into a more secure future in which our economic survival is not so directly linked to the unstable nations that supply our oil. Biofuels are the future America deserves, and we need to begin on that future today.