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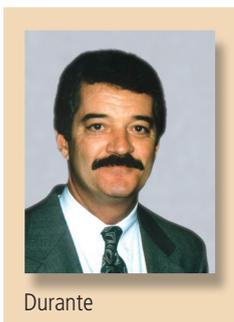
Ethanol — fueling corn demand



Photo by Seattle Filmworks and U.S. DOE/NREL.

by Suzi Fraser Dominy

Ethanol is fast coming of age. The global market is forecast to be worth over US\$16 billion by 2005. While Brazil is the trail-blazer in terms of both production and usage, it is the United States that is the world's largest producer of grain-based ethanol, with production set to double over the next ten years. Following the U.S. Senate's passage in June of the Renewable Fuels Standard Amendment that will further boost ethanol production, *Ethanol Across America*, a public outreach campaign, was launched to build support for ethanol.



Durante

World Grain talked to Douglas A. Durante, who directs the *Ethanol Across America* campaign through the Clean Fuels Development Coalition (CFDC's) foundation.

Durante serves as the Executive Director and Washington, D.C. Representative of the CFDC, which works in support of renewable alcohols and ethers and has a broad-based membership including automotive, agricultural, and other alternative energy interests.

Durante has been working in the fields of energy, transportation, and the environment since 1977. He was the Director of Public Affairs for the National Alcohol Fuels Commission and also served as a Special Assistant in the Office of Alcohol Fuels at the U.S. Department of Energy.

Durante has also been involved in the development of several ethanol projects throughout the U.S.

WG: How much ethanol is produced in the U.S.?

Durante: Currently the U.S. has the capacity to produce just under 3 billion gallons of ethanol per year. I use the term "capacity" because we are constantly adding new facilities and many of those come on during the course of the year. On an annualized basis, however, we are approaching 3 billion gallons and growing.

WG: How much of this is derived from corn and/or other grains?

Durante: The overwhelming majority of the ethanol produced in the U.S. is from corn, perhaps as much as 98%.

WG: How much is produced worldwide and where does the U.S. rank in world production?

Durante: Worldwide ethanol production is still relatively small in terms of the overall motor fuel pool. For example, the 3 billion gallons I mentioned as U.S. production is less than 2% of the overall motor fuel used. So these numbers sometimes are best viewed in their percentage of market. Also we have to distinguish that we are talking about fuel grade ethanol. There is a small amount of ethanol made for industrial and chemical purposes, so my comments are restricted to fuel grade, which is the overwhelming majority of what is produced. The entire combined worldwide production of ethanol is less than 1% of the motor fuel market.

WG: What other countries have active ethanol programs — which are the leaders?

Durante: The most active ethanol programs worldwide by far are in Brazil and the U.S. Those two countries represent more than 95% of total worldwide production. Brazil is responsible for approximately 58% of world ethanol production and the U.S. is at about 38%. From a worldwide standpoint, grains represent only 40% of ethanol production, but that is due to the fact that Brazil uses sugar crops rather than grain to produce ethanol. Therefore, the grain versus sugar division is reflective of the two countries most involved in this effort. The Europeans have indicated a great interest in assuming a more

aggressive role in the development of biofuels, so the next wave of growth could be in Europe. Like the U.S. and Brazil, however, that is almost completely dependent on the right policies and programs being in place to support these fuels.

WG: What is the growth projection and what does it mean for grain?

Durante: We believe the U.S. is headed for at least a doubling of its current production over the next decade. There are a number of reasons for this likely increase in demand. It can be safely assumed the majority of this demand will be met with grain as it remains the most economical and abundant source of starch. Current ethanol production consumes roughly 1 billion bushels of corn and the projected increase could easily result in an additional 1 billion bushels going to ethanol production as well. Currently there are 75 ethanol facilities in the United States with a tremendous increase in production capacity coming in just the last few years. The industry doubled from 1990 to 2000 and has almost doubled again from 2000 to 2003!

WG: What are the factors driving growth?

Durante: Current growth is due to a number of factors, but none more important than the industry recognizing that its market would be assured through a new requirement called the Renewable Fuels Standard (RFS). The RFS would effectively create a requirement for petroleum refiners to have a small percentage of their product pool derived from renewables. The stationary power industry is going through a similar effort that they call a renewable portfolio standard, but it is the same concept. If we want to ensure that we have a hedge against fossil fuels, in many cases we simply must require it.

In the case of ethanol this will have a dramatic effect on its growth and assure a market demand for the next decade. The U.S. House of Representatives passed legislation creating such a program and the U.S. Senate recently adopted an RFS as part of the energy legislation that is currently being debated. Although ethanol has historically had an incentive in the

Did you know...?

- Ethanol production is the third largest and fastest growing market for U.S. corn.
- More than 900,000 U.S. farmers are members of ethanol production cooperatives. Since 1990, farmer-owned cooperatives have been responsible for half of all new production capacity in the U.S.
- The largest ethanol plant construction boom in the history of the industry was sparked by the announcement that California would not be granted a special waiver from the CAA oxygenate requirement (see *"Rough road ahead for ethanol expansion"* World Grain, January, 2003; E-Archive #59992). Twelve new ethanol plants came on stream in 2002 — more than twice as many plants completed than in any previous year. Together with six expansions to existing facilities, more than 400 million gallons of production capacity were added to the industry.
- Ethanol is good news for feed manufacturers: in 2002, more than 800 million bushels of corn were processed into ethanol and feed co-products. In addition, 45 million bushels of grain sorghum were also used in the production of ethanol.
- Approximately 60% of U.S. ethanol production is dry milled, producing as a by-product 3.6 million tonnes of Distillers Dried Grains.
- Ethanol wet mills produced approximately 336,000 tonnes of corn gluten meal, 1.8 tonnes of corn gluten feed and germ meal.
- 1 bushel (0.0254 tonnes) of corn yields 2.7 gallons of ethanol, 14.4 Kg starch, 5 Kg gluten feed, 1.4 Kg gluten meal and .72 L corn oil.
- Use of ethanol fuel is limited by the scarcity of fuelling stations; there are only about 140 in 22 primarily Midwestern states. But this is set to change: in February 2003, General Motors Corp. announced a multi-million dollar campaign to promote the use of corn-based ethanol fuel E85 as an alternative to gasoline. The public awareness effort is a 2-year partnership with the non-profit National Ethanol Vehicle Coalition (NEVC) focused on increasing ethanol use in "flexible fuel vehicles" that are designed to use either ethanol or gasoline.



A farmer dumps a load of corn at this facility, where the entire kernel, including the hull, will be transformed into ethanol. More than 900,000 U.S. farmers are members of ethanol production cooperatives. Photo by Warren Gretz, U.S. Department of Energy's National Renewable Energy Laboratory.

- World consumption of ethanol is forecast to grow between 2% to 3% a year over the next three years. The report, "Ethanol-The International Market 2002" (published by Gobi International), forecasts that the global ethanol market will be worth over US\$16 billion by 2005, when total global consumption is expected to be over 41 billion liters, with the largest consuming regions being South America and Asia. [E-archive #64838](#)

To learn more about ethanol, visit the following websites:

ethanolcrossamerica.net

Renewable Fuels Association: www.ethanolrfa.org

The RFA Industry Outlook 2002 may be downloaded from: www.ethanolrfa.org/outlook2003.shtml

National Corn Growers Association: www.ncga.com

Gobi International: www.gobi.co.uk

Clean Fuels Development Coalition: www.cleanfuelsdc.org

The National Ethanol Vehicle Coalition: www.e85fuel.com

Canadian Renewable Fuels Association: www.greenfuels.org

form of reduced excise taxes, the uncertainty of selling the product was always a constraining factor.

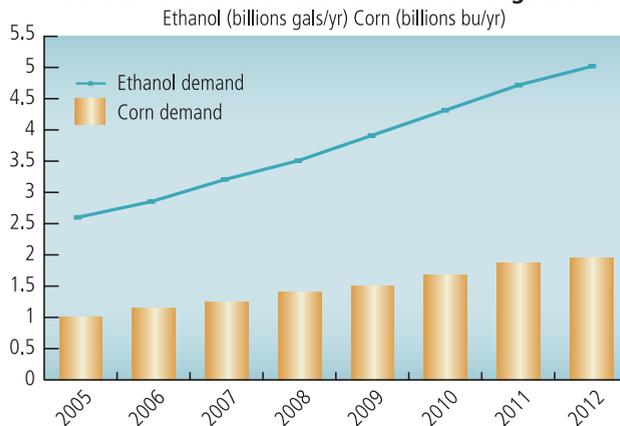
Ethanol is unique in that it is the only commodity I can think of that you must sell to your competitors. For a petroleum company to take on a unit of ethanol it must remove a unit of its own product. Therefore, it is not only necessary to discount the price, but you are also at their mercy as to whether they will even take it.

Much of this dilemma was overcome during the 1990s because of the Clean Air Act fuel programs that required clean burning additives like ethanol to meet a required oxygen content in gasoline. Even though a competing oxygenate called MTBE (methyl tertiary butyl ether) captured the lion's share of the market, ethanol still expanded significantly because of the Reformulated Gasoline Program (RFG). This program, despite tremendous success in reducing ozone and other harmful emissions, began to lose momentum. Refiners developed new ways of meeting clean fuel standards without the addition of oxygenates, auto technology continued to improve, and other pollution control measures began contributing thereby reducing the overall emissions inventory. The most important factor was that the competing oxygenate, MTBE, created a serious water contamination problem due to leaking tanks of the petroleum industry.

While gasoline and other harmful products were leaking from these tanks, MTBE got out in front of some of these gasoline spills and immediately found water tables. It has become such a serious problem that several states have banned its use beginning in 2004. The enactment of these bans would make compliance with clean fuel requirements even more difficult, so granting flexibility from some of the standards has led to a likely adoption of this renewable require-

ment. Otherwise ethanol would have been left somewhat high and dry with regard to market demand.

Ethanol and Corn Demand from New Legislation



Source: Clean Fuels Development Coalition

WG: What are some of the constraints on growth?

Durante: One thing history has taught us over the last 20 years is that alternative fuels have great difficulty, and in many cases have completely failed, to make a meaningful market penetration unless they received some type of assistance. This is primarily due to the fact that the petroleum industry is heavily subsidized and the price of petroleum products fails to reflect all the costs associated with its production, transport, and use.

The primary obstacle to growth for any of these fuels, including ethanol, is to address some of the economic and market uncertainties they face. The current excise tax exemption addresses many of the economic issues and if we are successful in getting the renewable fuels standard through, the market challenge will be overcome as well. Both of these are public policy initiatives that need to be maintained.

WG: What is Ethanol Across America?

Durante: Identifying constraints to growth is what led to the development of our *Ethanol Across America* program. We must recognize that ethanol is a result of these policies and programs and without public support it cannot continue. If we

are to provide tax incentives, market assurances, or other forms of assistance for ethanol we certainly need to have public opinion behind us. *Ethanol Across America* is a result of our 20-plus years of successful outreach and education and our intent is to build this support base so we can continue to enact ethanol programs to displace imported oil. We are being supported by the Department of Energy and we are very pleased that we have two U.S. Senators, Ben Nelson of Nebraska and Conrad Burns of Montana, who agreed to serve as co-chairmen of this campaign.

We will use a number of outreach techniques to reach a broad cross section of Americans. For example, we are conducting workshops across the country to help assess the feasibility of building ethanol plants. We will work with the media and public policy officials to help them understand the benefits that come from ethanol facilities. Rural economic development, the creation of jobs, tax flow back to the government, reduction of imported oil, and improved air quality are among the many subjects we will address.

I firmly believe that once people have a better understanding of ethanol and how it provides so many benefits, we will not only be able to reach the 5 billion gallon level called for in the renewable fuels standard, but go on to the next 5 billion.

We are never going to replace petroleum, but we can at least stop and see some of the benefits right here at home. **WG**

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For more information about the Ethanol Across America campaign, visit www.ethanolacrossamerica.net.

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