

[

Colorado Counties, Inc.

]



COUNTY PERSPECTIVES

Ethanol and Colorado

By Yilan Shen

June 2006

ETHANOL AND COLORADO

Current economic, political and environmental climates provide an impetus for change in the transportation fuel industry. With gas prices reaching three dollars per gallon and probabilities of it still climbing to new highs (Rather, 2006), consumers are eager to look for alternatives. Growing concern about the finite amount of oil that comes largely from foreign sources also fuels the need for alternatives. There is speculation that global production of oil has already peaked (Schoen, 2004). The topic of global warming is widely debated. One possibility is that the greenhouse gases emitted from conventional fuels are permanently altering our weather patterns, according to the National Academy of Sciences (EPA, 2000).

With such factors all pressing in the direction of change, biofuels are now more relevant than ever before. Biofuels such as ethanol have the potential to play a huge role in addressing all of these issues. Countries like Brazil have made strides in utilizing ethanol and establishing independence in fueling their vehicles (Rather, 2006). Federal efforts have been made to further the viability of ethanol and other biofuels. The state of Colorado has both the demand for the production of ethanol and the resources to supply the market. Some basic facts will be presented and the effects of the burgeoning ethanol trend in Colorado will be explored in this paper.

Definitions

Along with the new technology that is available in the biofuels industry, come new terms that are relatively unfamiliar. Below is a list of terms relevant to this discussion as defined by the National Renewable Energy Laboratory (NREL, 2000):

- Biomass is an "abundant, renewable, domestically grown source of energy that can be converted into transportation fuel."
- Biofuels are "sustainable transportation fuel[s] made from biomass."
- Biofuels include ethanol, methanol, biodiesel, biocrude and methane.
- Methyl tertiary butyl ether (MTBE) is a gasoline additive that was used as an oxygenate to reduce vehicle emissions and boost octane (USGS, 2006).

COUNTY PERSPECTIVES

Various forms of renewable energy are now available while others are currently being developed. Other biofuels will be briefly described below. The purpose of this paper is to focus mainly on ethanol, because it is the most prevalent in Colorado.

Ethanol is the most popular biofuel (NREL, 2000). More than 4.5 billion gallons of ethanol are produced in the U.S. every year (Brekke, May 5, 2006). It is an alcohol additive that can be blended with unleaded gasoline to increase octane level or used alone (ACE, 2006). It is made by fermenting starch crops like corn, in a process similar to brewing beer. The fuel is clean burning and reduces harmful air emissions.

Methanol is another alcohol fuel produced from biomass by using natural gas (NREL, 2000). It can be used on its own, as a feedstock for the gasoline additive methyl tertiary butyl ether (MTBE) or as fuel for fuel cells.

Biodiesel is used in place of diesel because it is renewable. It is made by combining natural oil or fat with an alcohol fuel, typically methanol. It can be used alone or as an additive.

Biocrude is similar to petroleum crude and is made by condensing biomass derived oil vapors.

Methane is from compressed natural gas and is made by anaerobic digestion.

Ethanol Basics

Ethanol is the most widely used biofuel (NREL, 2000). The ethanol used in the U.S. last year reached about four billion gallons (Goldstein, 2006). It is popular because it can be produced domestically. The fuel can be blended in any ratio with regular gasoline (ACE, 2006). The most common blends are E10 and E85. E10 blend is ten percent ethanol and 90 percent gasoline, while E85 is 85 percent ethanol and 15 percent gasoline. This biofuel is mostly made from starch crops such as corn, wheat or barley (Alternative Fuels Data Center, 2006). When it is made from cellulosic biomass such as trees or grass, it is called bioethanol or cellulosic ethanol. The process of making

COUNTY PERSPECTIVES

ethanol begins with grinding the crop. Then sugar is extracted from the material, after which the sugar is fed to microbes that eat the sugars to produce ethanol and carbon dioxide. Finally, the ethanol is purified to a specified level of concentration. Ethanol production can be done in a dry mill or wet mill process (ACE, 2006). The majority of production plants in the U.S. are dry mill.

Ethanol presents quite a few benefits for the environment, for independence from foreign oil markets and for the local economy. It is an environmentally sound fuel that reduces emissions that pollute the air, and does not contaminate ground water as MTBE does (ACE, 2006). MTBE was responsible for contaminated drinking water in 28 states

(Goldstein, 2006). Companies such as Valero Energy Corporation and ConocoPhillips are phasing out the production of MTBE, and using ethanol as the most viable replacement. It is efficient to make ethanol from corn, since it yields about 25 percent more energy than the energy that is used in the production process (Alternative Fuels Data Center, 2006). Recent technology has made the process of ethanol production more efficient resulting in an energy output:input ratio of 1.6.

Not all cars are equipped to use high concentration ethanol blends. E10 has been available and can be used in most conventional vehicles, but only flexible fuel vehicles (FFVs) can use blends of E85 or higher (Alternative Fuels Data Center, 2006). More and more automakers are offering FFVs. There are approximately five million FFVs in use in America right now (Rather, 2006). There are about 300,000 FFVs in the state of Colorado (Governor's Office of Energy Management and

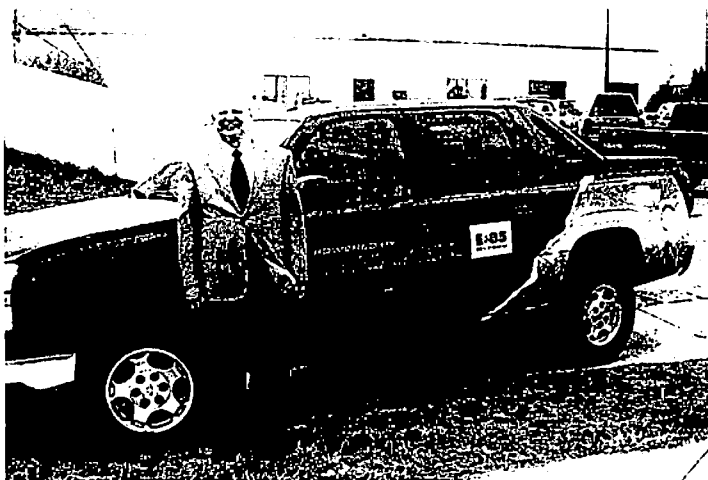
2006 Flex Fuel Vehicles

Ford Crown Victoria
Ford F-150
Ford Taurus (fleet purchase only)
Ford Taurus Wagon
Lincoln Town Car
Mercury Grand Marquis
Chevrolet Impala
Chevrolet Monte Carlo
Chevrolet Silverado
Chevrolet Avalanche
Chevrolet Tahoe & Police
Package Tahoe
Chevrolet Suburban
GMC Sierra
GMC Yukon
GMC Yukon XL
Nissan Titan
Chrysler Sebring
Dodge Caravan
Dodge Durango
Dodge Grand Caravan
Dodge Ram Pickup
Dodge Stratus

Sources: Colorado Corn Growers
Association and
Alternative Fuels Data Center

COUNTY PERSPECTIVES

Conservation, 2006). Don Ament, Commissioner of Agriculture in Colorado, speaks highly of his FFV in terms of its performance and clean fuel. It is a 2005 Chevrolet Avalanche and it displays its ethanol capabilities with pride (see photo). He is somewhat disappointed with the gas mileage, but the price of the E85 at the pumps makes up for it.



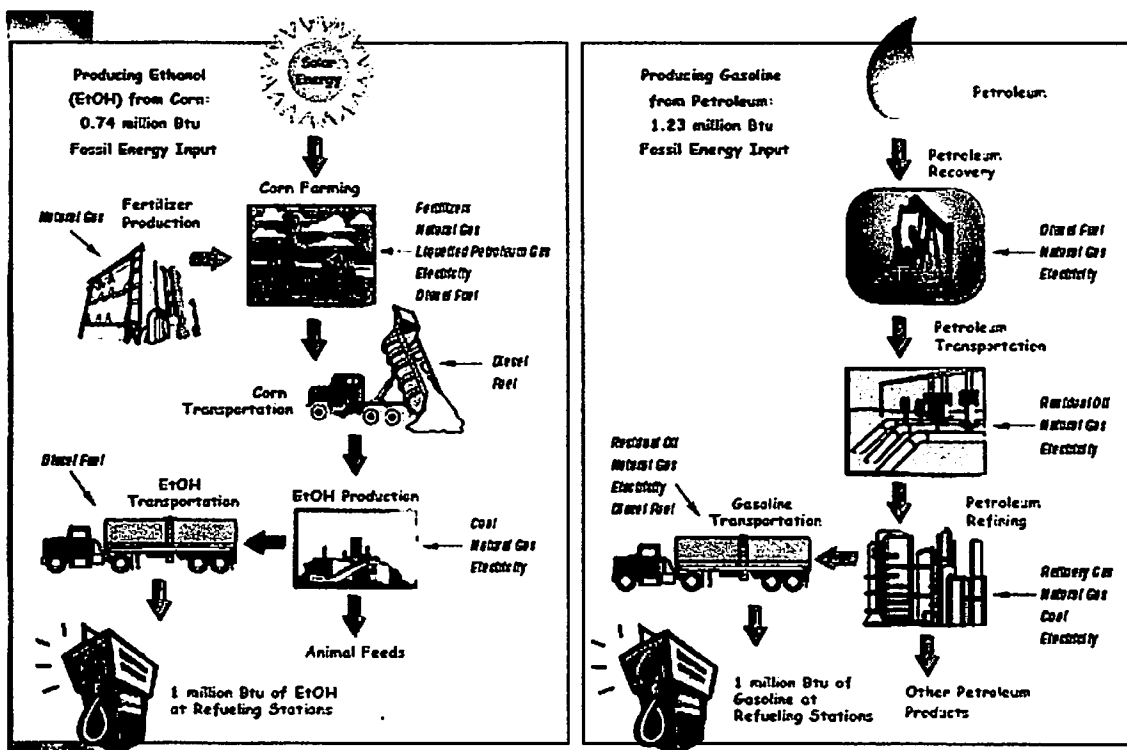
Colorado Commissioner of Agriculture, Don Ament and his ethanol fueled 2005 Chevrolet Avalanche

Why Ethanol?

Don Ament, Colorado Commissioner of Agriculture, said, "Ethanol isn't the end all, be all of agriculture or renewable energy, but it should be a part." The more ethanol that is used to fuel vehicles in America, the less oil is needed from foreign countries. Some of these countries have unstable governments. About two-thirds of all of the world's oil reserves are in the Persian Gulf region (NREL, 2000). According to the National Renewable Energy Laboratory, America imports more than 53 percent of the petroleum that it uses, a good portion of it from the oil producing countries in the Persian Gulf. The political unrest in this part of the world and the possibility of oil shortages in the future all point to potential problems, if America were to stay complacent in its dependence on foreign oil. Also, the importing of oil is responsible for about half the U.S. trade deficit. As Colorado Representative Cory Gardner said, "Ethanol is a homemade and homegrown renewable energy, made right here in Colorado."

Another way the American economy would benefit financially is by creating jobs in an industry that is primarily produced in rural communities. The lack of employment in rural America "has placed increasing burdens on our cities, infrastructure, and tax base" (NREL, 2000). Urbanchuk and Kapell (2002) reported in *Ethanol and the Local*

COUNTY PERSPECTIVES



Fossil energy inputs used to produce and deliver a million British thermal units (Btu) of ethanol and gasoline to a fueling station. (Source: Alternative Fuels Data Center)

Community the impacts that an ethanol plant had on a community. They based their results on a new 40 million gallon per year ethanol plant.

They estimated that about \$60 million would be spent to initially set up such a plant with most of the money spent locally (Urbanchuk & Kapell, 2002). They reported, "Construction of a production facility typically takes a year and the spending it pumps into the economy will generate a one-time boost of \$142 million in final demand as each dollar of spending circulates throughout the local economy." After the initial opening, the ongoing benefits are still present in the operation of the plant by purchasing local goods and using local services. The \$56 million annual boost would be from buying corn or other crops, labor and utilities. Other local economic benefits may include:

- Expansion of the economic base by \$110.2 million.
- Increase in household income by \$19.6 million.
- Creation of up to 694 permanent new jobs.
- Tax revenue increase of \$1.2 million.
- Increase in the price of corn by five to ten cents per bushel.

COUNTY PERSPECTIVES

Why Not Ethanol?

As with any emerging industry, ethanol advancement is not without challenges. A lot of the problems arise with an inadequate infrastructure to make ethanol available and marketable. As Roy Turner of Colorado-Wyoming Petroleum Marketers and Convenience Stores Association puts it, "I don't think ethanol is the answer until some new technology comes onboard to make the production of ethanol cheaper." There are 170,000 gas stations in the U.S., while only 650 of those stations sell E85 (Rather, 2006). Some of them already offer E10. However, E10 is insufficient to reduce our reliance on foreign oil. The difficulty in making E85 more available is that there is an initial investment necessary by the gasoline station owners. The American Petroleum Institute's estimated cost of providing E85 to a single gas station is \$200,000. At the same time, others estimate the cost would only be between \$30,000 and \$40,000 to convert a gas station to being E85 friendly.

Some critics point to the costly nature of ethanol (Sanchez, 2005). They argue that the ethanol market could bottom out if oil prices ever decreased drastically. Some also claim that it decreases gas mileage. One of the most well known critics of ethanol is David Pimentel from Cornell University in New York (Alternative Fuels Data Center, 2006). Pimentel reported that the process of growing corn and producing ethanol used 70% more energy than what would be yielded. Other sources such as Energy Efficiency and Renewable Energy point to the availability of new technology that makes the process more efficient, which refutes Pimentel's claims.

Inevitably, the problem of demand is also prevalent. Since only five million of the country's 133 million vehicles are FFVs, there simply is as yet not a large enough market base for E85 (Rather, 2006). Even though companies like GM are making a third of the FFVs on the road today and are spending millions of dollars to advertise to the U.S. market, major incentives to drive the market are still lacking in bringing E85 to mainstream use.

When asked about possible disadvantages of ethanol in Colorado, Jim Rubingh from the Colorado Department of Agriculture said, "We are a corn deficit state, so much of the

corn has to be shipped into Colorado. Using irrigated corn as your feedstock reduces the overall energy gain of ethanol.”

The Ethanol Trend

While debates might still be ongoing, ethanol is being produced and used domestically and abroad. Brazil is the world's largest ethanol producer, and they distill it from sugarcane (ACE, 2006). Brazil was faced with the problems of a substantial sugarcane surplus and expensive foreign oil imports (Rather, 2006). These conditions made Brazil the perfect candidate for the ethanol experiment. In the large cities like Sao Paulo, ethanol is sold in every gas station. FFVs became available only four years ago in the South American country. Since FFVs can run on gasoline, ethanol or a combination of both, ethanol has become a formidable competitor in the Brazilian market of transportation fuels. The greatest advantage is that ethanol is cheaper at the pump than gasoline.

Within our own country, Steamboat Rock, Iowa is one example of how a small local economy did benefit from the operation of an ethanol plant (Rather, 2006). They have a population of 300, and like many small farming communities, it was struggling to keep its economy afloat. Local investors pooled their life savings and opened Pine Lake Processing Plant to make ethanol. The plant reached maximum capacity after just one year of operating. Similar to what Urbanchuk and Kapell found in their study, the price of corn increased around Steamboat Rock from five to ten cents per bushel. The locals are delighted to keep all the money within their own community. In fact, the plant is looking to double its capacity next year, and even looking into a cheaper way to make ethanol from cellulose.

The demand for ethanol has at least tripled since 1996 (Sanchez, 2005). There are about 300 ethanol plants in business or in construction in the U.S. right now (Rather, 2006). Of these plants, 97 facilities are reaching production records every month and a number of them are under expansion (Brekke, May 5, 2006). As of March of 2006, there are four states in the U.S. that require some standard of ethanol use: Washington, Minnesota, Montana and Hawaii (Brekke, March 31, 2006). For example, Washington

COUNTY PERSPECTIVES

just passed a law which was signed by the Governor mandating that two percent of the gasoline used in the state to be ethanol by December 1, 2008. Other states like California are subsidizing the cost of adding E85 pumps to gas stations (Rather, 2006).

The estimate for ethanol use in Colorado is about 100 million gallons per year (Sanchez, 2005). In Colorado, three ethanol plants are in operation and five more are currently being constructed (Goldstein, 2006). Sterling Ethanol, in Sterling, Colorado opened in 2005. It buys 80 percent of the corn used for production locally and has raised the price of the corn as much as 20 cents per bushel in the area. Coors brewery in Golden, Colorado and Merrick & Co. of Aurora, Colorado are making 1.5 million gallons of ethanol a year from beer waste (Sanchez, 2005). The new plants and existing plants have all contributed to making Colorado a strong competitor for being one of the nation's top ten ethanol-producing states. When asked why there was an impetus for more ethanol now than ever before, Trent Bushner of Colorado Corn Growers Association pointed to the new available technology and the phasing out of MTBE.

Federal Policies

In his State of the Union Address, President George W. Bush said, "America is addicted to oil, which is often imported from unstable parts of the world. The best way to break this addiction is through technology" (EERE, 2006). On August 8, 2005, he signed the Energy Policy Act of 2005 (Washburn & Jennings, 2005). The bill mandates oil companies to increase the amount of ethanol that is added to gasoline from the current four billion gallons to 7.5 billion gallons annually

Colorado Ethanol Plants

Golden

Company: Molson/Coors
Size: 3 million gallons per year
Opened: 1996; expanded in 2005

Sterling

Company: Sterling Ethanol
Size: 45 million gallons per year
Opened: 2005

Walsh

Company: Sun Energy
Size: 2 million gallons per year
Opened: 2005

Evans

Company: Great Western Ethanol
Size: 110 million gallons per year
Opening: 2006

Fort Morgan

Company: U.S. Biogen
Size: 100 million gallons per year
Opening: 2007

Windsor

Company: Front Range Energy
Size: 40 million gallons per year
Opening: 2006

Yuma

Company: Panda Energy
Size: 100 million gallons per year
Opening: 2007

Yuma

Company: Affiliate of Sterling Ethanol
Size: 46-60 million gallons per year
Opening: 2007

Source: U.S. Sen. Ken Salazar's office

COUNTY PERSPECTIVES

by 2012. It gives incentives for the use of cellulosic ethanol. Provisions include requirements for federal agencies to use E85 and other biofuels in their FFVs. Tax credits can be given for establishing refueling properties that offer ethanol or other clean fuels. It changes the definition of a "small ethanol producer," and makes 60 million gallons per year production facilities eligible for tax credits. Grants and loan guarantee programs are created to aid in building facilities and doing research.

President Bush in the 2006 State of the Union Address also proposed an Advanced Energy Initiative (EERE, 2006). The main goal is to use viable alternatives to replace 75 percent of the oil that is imported from the Middle East by 2025. It proposes to increase the clean energy research at the Department of Energy by 22 percent. The President emphasized advancing research in the area of producing cellulosic ethanol and making it competitive with conventional gasoline in the next six years. The plan also includes \$150 million toward these goals, which is an increase of \$59 million from this year's funding.

Other federal legislation is in the works. One is the Enhanced Energy Security Act of 2006, introduced in May 2006 (Senate Committee on Energy & Natural Resources, 2006). One of the major provisions is the push for energy efficiency by saving on the use of oil: a savings of 2.5 million barrels a day by 2016, seven million barrels a day by 2026 and ten million barrels a day by 2031. It promotes further production of cellulosic ethanol, expands the authority of Secretary of Energy to offer loan guarantee and grant programs and gives funding for alternative fuel stations that offer E85.

Another federal bill that is under consideration is one that would lift the secondary 54 cents per gallon tariff on ethanol imports (Goldstein, 2006). The tariff was established in 1980 to alleviate America's reliance on imported energy. The Central American and Caribbean countries are exempt from the tariff as mandated by the Caribbean Basin Initiative, as long as it is seven percent of the U.S. demand. This new bill is aimed at increasing ethanol supply and dropping gasoline prices. Critics worry that the lifting of the tariff would stunt the growth of a domestic ethanol industry that is gaining new, substantial momentum.

COUNTY PERSPECTIVES

State Policies

Colorado Senate Bill 06-138 required 75 percent of all gasoline contain at least ten percent ethanol when sold between the months of November and April. Senator Brandon Shaffer and Representative Cory Gardner sponsored it. Representative Gardner emphasized his hopes for the legislation by saying, "It will reduce our reliance on foreign oil and at the same time help farmers in local communities develop a stronger economy." Senator Shaffer was hoping to "incentivize the use of ethanol in Colorado," especially the use of E85. The bill would credit the use of E85 toward the 75 percent standard by crediting one gallon of E85 used as 8.5 gallons of E10, and 50 to one credit for the use of cellulosic ethanol.

The oil and gas industry were major opponents of the measure and argued that it would raise the price of gasoline by a penny per gallon (Hartman, 2006). The Colorado Petroleum Association (CPA) was strongly against the bill because of the strict mandates and the impractical nature of some of the provisions. Stan Dempsey of CPA felt that the petroleum industry was bombarded with mandates. They are required to meet the mandates put forth in the Energy Policy Act of 2005 and local mandates from the Air Quality Control Commission. The Commission's Regulation Number 13 requires the blending of ethanol into gasoline between November and February only in the Denver metro area.

Colorado is one of 25 states that has banned MTBE, increasing the demand for ethanol in the state (ACE, 2006). The Colorado Corn Growers Association was one of the major proponents of the legislation. President of the Association, Trent Bushner, expressed great hopes for the bill because it would drive the market for ethanol. He spoke about the importance of providing another driving force in the promotion of ethanol. The proponents of ethanol do not have any clout in the oil and gas business, where the changes actually have to be made. Senator Shaffer mentioned that there were more amendments attached to Senate Bill 06-138 than other controversial bills, which demonstrated the contentious nature of the debate.

Governor Bill Owens vetoed Senate Bill 06-138 on May 26, 2006, stating that, "Free

COUNTY PERSPECTIVES

market principles, the same principles that have established ethanol as a economic alternative to fossil fuels, are overlooked by this legislation" (Governor Owens' Veto Letter Regarding SB06-138, 2006). At the same time, Governor Owens has formed the Ethanol (E85) Coalition "to increase awareness, availability, and usage of E85 in the State of Colorado" (Governor's Office of Energy Management & Conservation, 2006). The Coalition provides funds for the expansion of E85 pumps in fuel stations. Stan Dempsey of Colorado Petroleum Association reported that the petroleum industry blended lots of ethanol without being required to do so by law, because they received tax credits and expanded their supply pool by doing so. Thus, CPA and the Governor are in agreement in believing that mandates are unnecessary in the promotion of ethanol use.

The Future of Ethanol

Outside of Ottawa, Canada, there is a little plant called Iogen that makes ethanol out of straw (Schalch, 2006). Iogen is the only plant that currently makes cellulosic ethanol. Brian Foody, CEO of the plant, claimed that 50-100 billion gallons of ethanol could be made from resources that are already available like straw, switchgrass, corn stalks or even municipal waste. This amount of ethanol is enough to replace roughly 30-50% of the gasoline that is used in the U.S. annually (EERE, 2006).

The advantage of making ethanol out of cellulosic materials is that it is cheap, since most of these kinds of materials cannot be sold as food (Schalch, 2006). Another competitive edge that cellulosic ethanol has over corn ethanol is that the process uses less fossil fuels. Making corn ethanol uses a lot of natural gas and coal to operate tractors and such. It takes one tenth as much fossil fuel to run a cellulosic ethanol plant as it would a corn ethanol plant. Making cellulosic ethanol is efficient because the extraneous lignin (fibers extracted from the production process) can be burned to produce steam and electricity to run the necessary vehicles. Essentially, the energy that is used to operate the plant is the same energy that was originally derived from the sun when the plant life was photosynthesizing.

Iogen is still an experimental plant (Schalch, 2006). Aside from spreading the word

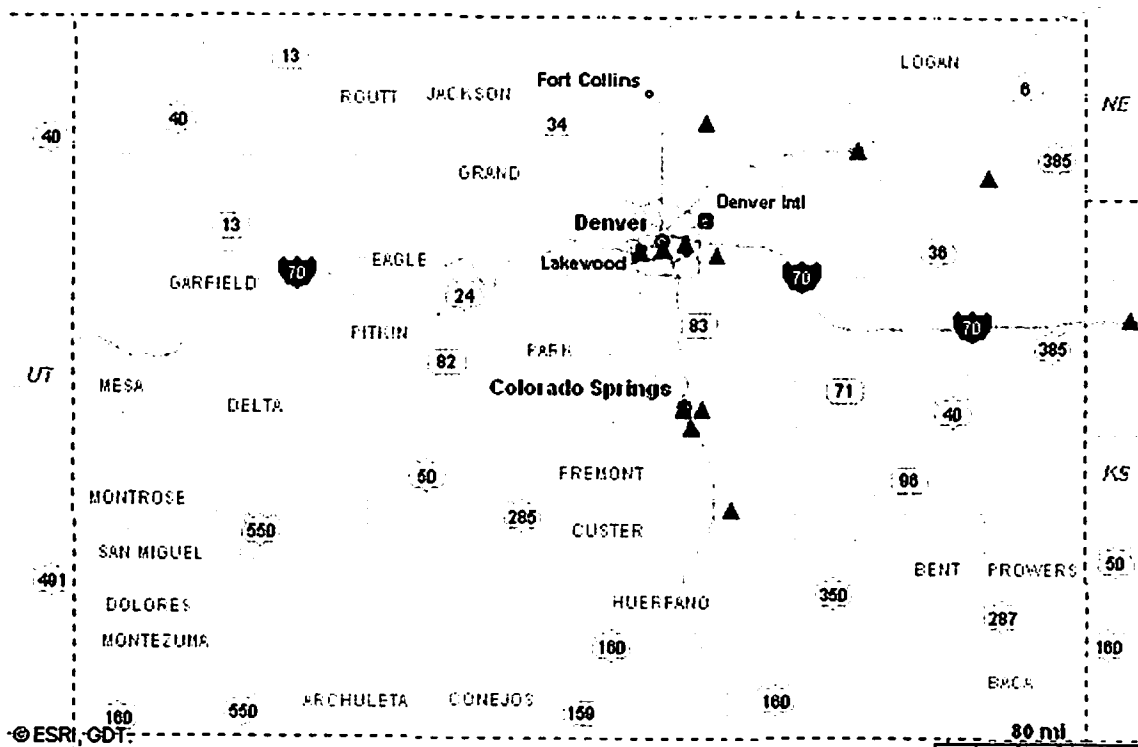
[

]

COUNTY PERSPECTIVES

about the environmentally friendly fuel and making more FFVs available, there are the challenges of cost and transporting. While cellulosic ethanol definitely holds potential for solving a lot of energy problems in the future and meeting goals set forth by the government like the Energy Policy Act of 2005, there remain challenges to be met. Even if the market does meet the demands of 7.5 billion gallons of ethanol a year, it is still a minute portion of the 140 billion gallons of gasoline that is used in the U.S. (Rather, 2006). As proposed by President Bush in the Advanced Energy Initiative, the hope is to make cellulosic ethanol competitive in price within the next six years. Shipping the product poses yet another challenge in delivering cellulosic ethanol. Existing pipelines cannot be used to transport ethanol. The solution would be to build larger plants that are based on the logen formula throughout the country. What is needed to realize this goal is startup capital. Foody hopes to open plants like logen all over the U.S., starting with the first commercial plant within the next year in Idaho.

In Denver, Colorado, a gas station on the intersection of Alameda and Broadway sells E85. It is where Don Ament, Colorado Commissioner of Agriculture, fills up his



Fueling stations in the state of Colorado that offer E85. (Source: Alternative Fuels Data Center)

COUNTY PERSPECTIVES

Chevrolet Avalanche with fuel. He is very proud to say that about 2,800 gallons of ethanol has been used in his truck, and only two or three tanks of traditional gasoline have been used. Commissioner Ament sees the importance of the "bigger picture" of promoting ethanol and moving away from our reliance on foreign oil. The owner of the station is a member of the Colorado-Wyoming Petroleum Marketers and Convenience Stores Association, of which Roy Turner is the Executive Vice President. Mr. Turner reported that the station where Commissioner Ament fills up his tank sells about 1,000 gallons of E85 per month. There simply is not enough demand for this product. Mr. Turner does not believe that ethanol production or mandated usage is feasible in Colorado. Both Commissioner Ament and Mr. Turner agree that more consumer interest is needed to drive the market, if ethanol is to have a chance in the transportation fuel industry. When more people know about E85 and FFVs, more people will possibly purchase vehicles like the Chevrolet Avalanche. The demand for more E85 fuel stations will increase, without needing a government mandate.

Whether the U.S. can follow the Brazil model or find its own path to independence from foreign oil, it is necessary to explore the possibilities of ethanol. For a state like Colorado, there are opportunities and needs for fuel choices. Both consumer demands and governmental actions would shape this burgeoning industry. It remains to be seen what role ethanol will play in addressing the economic, political and environmental needs of America.

References

- ACE. (2006). *American Coalition for Ethanol*. Retrieved May 3, 2006 from <http://www.ethanol.org/index.htm>.
- Alternative Fuels Data Center. (2006, April 4). *Alternative Fuels*. Retrieved May 25, 2006 from <http://www.eere.energy.gov/afdc/altfuel/ethanol.html>.
- Brekke, K. (2006, March 31). Washington becomes fourth state to require ethanol use. *American Coalition for Ethanol*. Retrieved May 10, 2006 from <http://www.ethanol.org/PressRelease3.31.06.htm>.
- Brekke, K. (2006, May 5). Suspending the ethanol tariff wouldn't solve the gas price problem. *American Coalition for Ethanol*. Retrieved May 10, 2006 from <http://www.ethanol.org/documents/SuspendingEthanolTariffNottheAnswer.pdf>.
- EERE. (2006, February 1). President Bush proposes energy initiative to reduce oil imports. *EERE Network News*. Retrieved May 25, 2006 from <http://www.eere>.

COUNTY PERSPECTIVES

- energy.gov/news/news_detail.cfm/news_id=9700?print.
- EPA. (2000). Global warming. *U.S. Environmental Protection Agency*. Retrieved May 18, 2006 from <http://yosemite.epa.gov/oar/globalwarming.nsf/webprintview/Climate.html>.
- Goldstein, D. (2006, May 10). Ethanol tariff helps infant U.S. industry, Salazar says. *Bloomberg News*. Retrieved May 10, 2006, from http://www.denverpost.com/portlet/article/html/fragments/print_article.jsp?article=3803238.
- Governor Owens' Veto Letter Regarding SB06-138. (2006, May 26). Governor Bill Owens' Site. Retrieved May 29, 2006 from <http://www.colorado.gov/governor/press/may06/sb138.html>.
- Governor's Office of Energy Management & Conservation. (2006). E85 Coalition. Retrieved May 29, 2006 from http://www.state.co.us/oemc/programs/transportation/e-85_coalition.htm.
- Hartman, T. (2006, May 15). Environmentalists count victories at Capitol. *Rocky Mountain News*, 5A.
- NREL. (2000, June). Biofuels for sustainable transportation. Retrieved May 3, 2006 from <http://www.nrel.gov/docs/fy00osti/25876.pdf>.
- Rather, D. (2006, May 7). The ethanol solution. *CBS News 60 Minutes*. Retrieved May 15, 2006 from <http://www.cbsnews.com/stories/2006/05/04/60minutes/printable1588659.shtml>.
- Sanchez, R. (2005, October 24). Coors ramping up production of ethanol from beer waste. *The Denver Post*. Retrieved May 17, 2006 from <http://www.denverpost.com/2005/autosinsider/0510/25/01-358749.htm>.
- Schalk, K. (2006, May 16). Canadian dreams of ethanol distilled from grass. *NPR Morning Edition*. Retrieved May 19, 2006 from <http://www.npr.org/templates/story/story.php?storyId=5407551>.
- Schoen, J. W. (2004, October 25). How long will the world's oil last? As production peaks, economic impact could be dire. *MSNBC*. Retrieved May 18, 2006 from <http://www.msnbc.msn.com/id/5945678/print/1/displaymode/1098/>.
- Senate Committee on Energy & Natural Resources. (2006, May 4). Bipartisan bill aims to boost efficiency, reduce U.S. reliance on imported oil. Retrieved May 19, 2006 from http://energy.senate.gov/public/index.cfm?FuseAction=PressReleases.Detail&PressRelease_id=234951&Month=5&Year=2006&Party=0.
- Urbanchuk, J. M. & Kapell, J. (2002, June 20). Ethanol and the local community. *AUS Consultants/SJH & Company*. Retrieved May 10, 2006 from http://www.ethanol.org/pdfs/ethanol_effects.pdf.
- USGS. (2006). MTBE. *Toxic Substances Hydrology Program*. Retrieved May 3, 2006 from http://toxics.usgs.gov/definitions/mtbe_def.html.
- Washburn, E. & Jennings, B. (2005, August). Summary of ethanol-related provisions in H.R. 6, The Energy Security Act of 2005. *American Coalition for Ethanol*. Retrieved May 19, 2006 from http://www.ethanol.org/documents/ACERFS_Summary.pdf.

Resources and Links

USDA Rural Development, <http://www.rurdev.usda.gov/co/>.
800.659.3696

National Renewable Energy Laboratory, www.nrel.gov.
303.275.3000, 1617 Cole Blvd., Golden, CO 80401-3393

United States Department of Energy/Energy Efficiency and Renewable Energy,
www.eere.energy.gov.

Governor Owens' Office of Energy Management and Conservation, www.state.co.us/oemc.
303.866.2100, 225 E. 16th Avenue, Suite 650, Denver, CO 80203

Colorado Corn Growers Association, www.coloradocorn.com
970.351.8201, 127 22nd Street, Greeley, CO 80631

American Coalition for Ethanol, www.ethanol.org
605.334.3381

Colorado-Wyoming Petroleum Marketers and Convenience Stores Association
303.422.7508, 4465 Kipling Street, Suite 104, Wheat Ridge, CO 80033

Colorado Petroleum Association, <http://www.coloradopetroleumassociation.org/>.
303.860.0099, 1410 Grant Street, C-307, Denver, CO 80203

County Perspectives is a publication of Colorado Counties, Inc. For additional information, please contact Yilan Shen at 303.861.4076 or yshen@ccionline.org

Colorado Counties, Inc.
800 Grant St., Suite 500
Denver CO 80203