# Ethanol DA

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#### Ethanol industry struggling now- low demand

Pore 6-22, Robert Pore, staff writer for The Independent, “Low Profit Margins Hurting Ethanol Industry” June 22, 2012 <http://www.theindependent.com/news/local/low-profit-margins-hurting-ethanol-industry/article_aec1744e-5b68-5802-aab0-64e1c7ebab8b.html?mode=print> Accessed 6-30-12

According to U.S. Energy Information Administration, this week ethanol production averaged 900,000 barrels per day -- or 37.8 million gallons daily. That is down 20,000 b/d from the week before and is a six-week low. The four-week average for ethanol production stood at 906,000 b/d for an annualized rate of 13.9 billion gallons. Stocks of ethanol stood at 21.2 million barrels as ethanol inventories grew by 519,000 barrels, with every region in the U.S., except the Rocky Mountain region, experiencing stock builds. EIA reported that Midwest inventories rose to a seven-week high. "We are seeing pretty soft demand for ethanol, so the price value of ethanol hasn't been very good," Sneller said.

#### **Improving infrastructure bolsters industry growth**

Porter 11, Stu (BBI Biofuels Canada Director has had more than five years experience in conducting biofuels technical studies involving the environmental impacts of biofuel production facilities on water supply, demand and quality.) and Brad Saville (BBI Biofuels Canada Senior Technical Advisor has had more than ten years experience in conducting biofuels technical studies involving the environmental impacts of biofuel production facilities on watter supply, demand and quality) 2011

Increased transportation infrastructure allows the Biofuel industry to grow

In general, biofuels production facilities are located in close proximity to the feedstock. When determining potential feasibility of a biofuels production facility, feedstock within a 100 mile (160 kilometer) radius is considered, taking into consideration factors such as “disappearance” and “carry over.” In this context, “disappearance” is a measure of feedstock use (e.g., canola or rapeseed for biodiesel production or corn for ethanol production), and “carry over” is the amount of the crop or feedstock from the previous year that remains at the start of the new crop year. Although feedstock access is generally the driving force in biofuels production facility location, proximity to rail and transportation infrastructure to access markets is also a critical factor. In the unusual case where a significant portion of the feedstock is imported, access to waterways may be a driving force. A critical issue relative to transportation infrastructure is that the location of biofuels production facilities is generally not determined by proximity to fuel market or blending facilities. However, some countries in the EU, such as Germany, have some production facilities located close to petroleum refineries. The fact that biofuels production facilities are often not located close to blending facilities creates particular logistical and infrastructure challenges. In the future, as cellulosic biofuels are developed, producers may face transportation infrastructure challenges for both feedstock and biofuel product. The cost to transport biomass rises sharply with distance, and is also much higher for agricultural residues compared to forest residues, due to the very low free fall bulk density of agricultural residues. These factors limit both the size and location of the biofuels facility. Although densification strategies have been proposed to facilitate longer-distance transportation of agricultural residues, these densification strategies also render the resulting feedstock much more difficult to process via conventional biological methods. Consequently, densification may only prove useful for thermochemical production of biofuels. Facilities that use biochemical technologies are much more likely to be located closer to feedstock, with a greater need for product transportation infrastructure. However, if dedicated pipelines are built, some cellulosic ethanol plants may locate closer to the ethanol pipelines, because this would simplify the downstream product distribution.

#### Ethanol jacks food prices and lack of long-term viability means no impact turns

Eaves 7, James Eaves, assistant professor in the Department of Finance and Insurance at Laval University, and Stephen Eaves, vice-president of Eaves Devices, 10-3-07, Washington post, Is Ethanol the 'Energy Security' Solution?, <http://www.cato.org/pub_display.php?pub_id=8730>

But is ethanol a truly renewable energy source, and is it more secure and dependable than oil? The answer to both of those questions, surprisingly, is no.

First of all, ethanol is not currently produced in a "renewable" manner — the production process is almost completely dependent on fossil fuels such as coal, natural gas and diesel. Furthermore, a recent study published in the *Proceedings of the National Academy of Sciences* shows that even the nonrenewable production of ethanol could displace at most 14 percent of U.S. gasoline consumption — if all of the corn grown by American farmers were devoted to ethanol production.

If ethanol were produced in a manner that did not require fossil fuels, only a trivial amount of fuel would make it to the pumps. To see why this is so, consider a [2002 U.S. Department of Agriculture study](http://www.transportation.anl.gov/pdfs/AF/265.pdf) — one trumpeted by ethanol proponents — that estimated how much energy is used at each stage of the ethanol production process. If we assume that the USDA's calculations are correct, but instead of using fossil fuels to provide the energy at each stage we suppose that a portion of the produced ethanol itself is used, we make the process self-contained or sustainable. In this case, processing all the corn in the country would displace about 3.5 percent of our gasoline consumption. That is about as much as the Natural Resources Defense Council estimates we would save if we simply inflated our tires properly. Also, bear in mind that the United States is responsible for about 70 percent of global corn exports, so even small diversions of corn supplies to ethanol could have dramatic implications for food prices and the health of the world's poor.

Another ethanol shortcoming is that it is not very secure. While it is true that U.S. corn yields have increased substantially over the past few decades, researchers have observed that the year-to-year percentage gain has steadily declined. The rate peaked around 4 percent in the early 1960s and was less than 1.5 percent in 2001. That growth rate is not expected to keep up with food demand.

Moreover, variability in U.S. corn yields appears to be increasing, a point that is underscored by this summer's drought. Researchers predict that, even under the best-case global warming scenario, corn yields are likely to decline by 22 percent in the short-run.

For the sake of argument, let us be optimistic and assume yield variability will remain within historical parameters. We can then use data from the National Agricultural Statistics Service to estimate the frequency and size of ethanol disruptions that we should expect in the future. We then can compare this variability to the variability in oil imports.

Specifically, let us consider the time period 1960-2005, a period that included, among other oil shocks, the Six-Day War, the Arab oil embargo, the Iranian revolution, and the outbreak of the Iran-Iraq War. If variations in the supplies of both corn and oil during this period are a reasonable guess about future variability, then in any given year we should not be surprised if corn yields decline by 11.9 percent. In contrast, a typical decline in Middle Eastern oil supplies would be only 6.8 percent. Moreover, in one out of every 20 years, we would expect corn yields to decline by 31.8 percent, while the corresponding disruption in the oil supply would be only 14.9 percent. Thus, based on history, displacing gasoline with ethanol would exchange geopolitical risk with yield risk. History suggests that yield risk is about twice as high.

Lastly, relying on ethanol exposes the economy to an entirely new risk: the link between ethanol supply disruptions and ethanol demand shocks created by their common dependency on weather conditions. For example, a summertime heat wave would increase the demand for ethanol as drivers travel longer distances on vacation to escape the heat, spend more time on congested roads, and use their cars' air conditioning more intensely. At the same time, because corn yields are especially sensitive to rainfall shortages during July and high-temperatures during August, the heat wave also would likely reduce corn yields, thereby increasing the price of corn and the cost of producing ethanol. In this way, weather would adversely affect both the supply of and demand for ethanol. Gasoline does not suffer this risky linkage; though drivers would still travel further on vacation and use their air conditioning during a heat wave, there is no apparent connection between summertime heat and the supply of gasoline.

#### Every unique increase in prices kills billions

Tampa Tribune 96 Paul Power Jr., “Grain shortage growing problem,” 1-20, p. Lexis.

There are more people in this world than ever, but less grain to feed them. That's kindled fears of a world food crisis, a problem Florida may help prevent. Poor weather, drought, political unrest and economic shifts have decreased planting, pushing world grain reserves to record lows. Meanwhile, the world's population grew by 100 million, to 5.75 billion in 1995 - a record increase. Now, miners in West Central Florida are digging out phosphate more quickly, so it can be used to make fertilizer. Analysts are warning about the increasing possibility of flood or drought in the world's food-producing regions. That can push food prices much higher, both here and abroad, and even cause famine in the poorest countries. U.S. food prices may rise more than 4 percent this year, ahead of the rate of inflation. "Conditions today indicate that there is at least some vulnerability in the food supply," said Sara Schwartz, an agricultural economist with the U.S. Department of Agriculture. Corn and soybean production plunged last year in the United States, she said. Wet weather slowed grain planting in the United States and Canada. Elsewhere, drought and civil conflict in sub-Saharan Africa cut production to 20 percent below normal. The European Union has less than one quarter of the grain reserves it held in 1993. The amount of corn expected to be available in the United States by summer - when corn is harvested - was trimmed by crop forecasters this week to 507 million bushels, the lowest in 20 years. On a global scale, food supplies - measured by stockpiles of grain - are not abundant. In 1995, world production failed to meet demand for the third consecutive year, said Per Pinstrup-Andersen, director of the International Food Policy Research Institute in Washington, D.C. As a result, grain stockpiles fell from an average of 17 percent of annual consumption in 1994-1995 to 13 percent at the end of the 1995-1996 season, he said. That's troubling, Pinstrup-Andersen noted, since 13 percent is well below the 17 percent the United Nations considers essential to provide a margin of safety in world food security. During the food crisis of the early 1970s, world grain stocks were at 15 percent. "Even if they are merely blips, higher international prices can hurt poor countries that import a significant portion of their food**,"** he said. "Rising prices can also quickly put food out of reach of the 1.1 billion people in the developing world who live on a dollar a day or less."

## Uniqueness

### Uniqueness – Ethanol

#### Ethanol Production is grinding to a halt

Piller 6-1-12 Dan (Buisness Writer at the Desmoine Register http://www.governorsbiofuelscoalition.org/?p=2807)

Ethanol production dropped by 17,000 barrels per day during the week ended May 25, although stockpiles of 21.5 million barrels remain 6.3 percent higher than a year ago, the U.S. Department of Energy reported this week. A reflection of soft demand for ethanol is the price, which on Thursday dipped to $2.02 per gallon on the Chicago Board of Trade futures market. Since the 45-cent-per-gallon blenders credit expired at the end of 2011, wholesale ethanol has fallen from $2.75 per gallon in late 2011 to $2.36 per gallon in April and $2.24 at the beginning of May. Falling ethanol prices have caused ethanol operating margins to average a negative 10 cents per gallon in the first quarter of 2012, after averaging a profit of 40 cents per gallon in the last quarter of 2011 before the tax credit ended. The Department of Energy reports show that U.S. oil stockpiles are at their highest levels since the early 1990s, courtesy of a 12 percent increase in crude oil production over last year.

### Uniqueness – General

#### Global biofuels growth set to slow for the next 5 years on weak Brazil prospects

Platts 11 (provider of energy and metals information and a source of benchmark price assessments in the physical energy markets. http://www.platts.com/RSSFeedDetailedNews/RSSFeed/Petrochemicals/8692378)

The pace of global biofuels production growth will be slower than previously forecast over the next five years due to weaker prospects for Brazilian ethanol and as the US market becomes saturated, the International Energy Agency said Tuesday. Updating medium-term forecasts made in June, the IEA said it sees global biofuels growth from 2010 to 2016 at just 400,000 b/d, versus 500,000 b/d previously. It now expects biofuels supply to reach 2.22 million b/d in 2016, up from 1.822 million b/d in 2010. Brazilian ethanol production in 2011 is now expected to decline by 75,000 b/d to 375,000 b/d due to a poor sugar cane harvest and high sugar prices, the IEA said. Over the next five years, the IEA has reduced its outlook on average for Brazilian ethanol output by an average 100,000 b/d, reaching 530,000 b/d in 2016. "Challenging production economics and underinvestment in cane production and ethanol distillery capacity looks likely to persist over the medium term," the IEA said in its latest monthly report.In the US, ethanol production growth is likely to slow over the medium-term, the IEA said, with the year-end expiry of a 45 cent/gallon blenders tax credit set to slow distillery investment amid increasing saturation in the US market .The IEA said US ethanol output is still likely to reach 980,000 b/d in 2016, in line with the Renewable Fuels Standard, but revised down its outlook by an average 20,000 b/d over the 2012-2014 period. US biodiesel production was also revised down, by 10,000 b/d on average from 2012-2016, the IEA said. In Europe, The IEA revised down its biofuels production estimate by 10,000 b/d for 2010-2016, largely due to lower biodiesel output.

#### Biofuel companies are going bankrupt in the squo – eBiofuels proves

Orwel 4-23-12 George(staff reporter at [dtn](http://www.linkedin.com/company/11383?goback=%2Efps_PBCK_*1_george_orwel_*1_*1_*1_*1_*2_*1_Y_*1_*1_*1_false_1_R_*1_*51_*1_*51_true_*2_*2_*2_*2_*2_*2_*2_*2_*2_*2_*2_*2_*2_*2_*2_*2_*2_*2_*2_*2_*2&trk=pro_other_cmpy) senior reporter at petroleum intelligence weekly staff reporter at [Dow Jones Newswires](http://www.linkedin.com/company/2280?goback=%2Efps_PBCK_*1_george_orwel_*1_*1_*1_*1_*2_*1_Y_*1_*1_*1_false_1_R_*1_*51_*1_*51_true_*2_*2_*2_*2_*2_*2_*2_*2_*2_*2_*2_*2_*2_*2_*2_*2_*2_*2_*2_*2_*2&trk=pro_other_cmpy) University of Oxford Brooklyn Law School Columbia University - Graduate School of Journalism http://oilspot2.dtnenergy.com/e\_article002413040.cfm?x=b11,0,w)

e-Biofuels LLC, an Indiana-based renewable fuel company that’s a subsidiary of Imperial Petroleum Inc., recently filed for Chapter 7 bankruptcy with the U.S. Bankruptcy Court for the Southern District of Indiana, and is in the process of winding down the business, the company’s chief executive told Telvent DTN during an interview on April 18. Jeffrey T. Wilson said e-Biofuels filed bankruptcy papers on April 4, a day before he was brought on board as new CEO of the renewable fuels company. He is also president and CEO of the parent company, Imperial Petroleum. He said e-Biofuels, which produced 30 million gallons a year of ethanol from 2007 until just before the bankruptcy filing, was unable to survive the current economic environment whereby high corn prices and limited demand for fuel ethanol have combined to squeeze margins for ethanol producers.

#### Biofuels expected to continue to decline

Harriman 7-15-12 Peter (Staff writer at Argus Leader <http://www.governorsbiofuelscoalition.org/?p=3286>)

Low oil prices coupled with high corn prices set up a perfect storm for the ethanol industry — a perfectly bad storm. Valero already has cut production at its ethanol plant in Huron and it has idled a plant in Nebraska, according to Lisa Richardson, executive director of the South Dakota Corn Growers Association. The price of crude oil opened 2012 at $101.56 per barrel. It mostly remained above $100 until late April. Since then it has declined to about $85. Routine maintenance scheduled for later in the year can be pushed up to allow ethanol plants to cut back production when the profit margin of biofuel shrinks, according to Brian Jennings, executive vice president of the American Coalition for Ethanol. However, “the truth is these plants were built to run at full throttle. That’s where they run efficiently,” he says. The ethanol industry learned a painful lesson in 2008. VeraSun, then one of the country’s largest ethanol producers, aggressively bought high-priced corn futures in the belief the market would continue climbing. It didn’t, and VeraSun went bankrupt.

#### Biofuel plants are shutting down worldwide

Biofuels Digest 11 8-11-11 (http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=0CGoQFjAB&url=http%3A%2F%2Fwww.biofuelsdigest.com%2Fbdigest%2F2011%2F08%2F08%2Fjamaica-ethanol-processing-shuts-down-citing-weak-demand%2F&ei=ll8MUNGAFIWVrAHz9-mmCw&usg=AFQjCNFUPMNvO25vQTNZ8YCj3rhBgYe0gg&sig2=tnHefMVTO-C5ZM2rJvKZ9w)

In Jamaica, Jamaica Ethanol Processing [shut down its plant this week](http://www.jamaicaobserver.com/business/Jamaica-Ethanol-shuts-down-plant--cuts-31-jobs_6748609?), cutting 31 jobs due to three years of rising input costs that pushed the company out of the market. The company had operated for 26 years. The facility produced 50 million gallons of ethanol annually, primarily dehydrating Brazilian hydrous ethanol for the US market.

## Links

### Links – General

#### Infrastructure sustains agribusinesses like biofuels

Casavant 10 (Ken, Director, Freight Policy Transportation Institute, “The Critical Status of Agricultural Transportation in the

Pacific Northwest” Wheat Life, March 2010, http://www.fpti.wsu.edu/research/Documents/Reports/FPTI\_Report6.pdf MGE)

An effective transportation system supports rural economies, reducing the prices farmers pay for inputs, such as seed and fertilizer, raising the value of their crops, and greatly increasing their market access. The economies of rural areas are intertwined. As agriculture thrives, so does its supporting community. Providing effective transportation for a rural region stimulates the farms and businesses served, improving the standard of living. The interaction of agriculture and the off-farm jobs it supports provides a solid base for rural communities. Agriculture is far from the largest employer in rural America. Four other sectors—services, government, retail and wholesale trade, and manufacturing—comprise 80 percent of rural employment. Agriculture is responsible for less than one in ten rural jobs but, because it is so capital-intensive, it generates much more economic activity in the community than just the jobs it creates. The transportation system that contributes to the success of agriculture also supports rural manufacturing. Although the traditional view of rural America is agricultural, it is, in fact, manufacturing that is critical. Manufacturing employs 15 percent of the rural workforce. As a share of total employment, manufacturing is 42 percent more important to rural America than to metropolitan America. The availability of rail, air and highway services is one of the most commonly cited requirements of manufacturing and commercial establishments.

Grain proves the plan bolsters agribusinesses like biofuels

TCS 11 (“US Grain Transportation System Not Keeping Pace,” The Crop Site, 3/1/11, <http://www.thecropsite.com/news/7727/us-grain-transportation-system-not-keeping-pace> MGE)

For decades, US farmers raised more grain than global customers were buying, so the nation could live with inefficiencies in moving it to port via truck, rail or barge. By 2002, however, world demand decreased the surplus, and US infrastructure deficiencies started to become more apparent – and problematic. The United States must place greater priority on the movement of freight because the aging US transportation system is not keeping up with today’s pace of international trade, according to two infrastructure experts who addressed the US Grains Council International Marketing Conference & Annual Membership Meeting Feb. 8 in New Orleans. Wake Up Call on Infrastructure Kurt Nagle, CEO of the American Association of Port Authorities, and Ken Eriksen, senior vice president at Informa Economics, said the country needs a wake up call on its infrastructure. “A nation is judged by its infrastructure, and the United States is getting worse by the year, if not the day,” Nagle said, whose organization represents 160 port authorities in the Western Hemisphere. “We need an attitude adjustment about infrastructure,” Eriksen said. In a world where communication is instantaneous, and overnight delivery of packages is standard operating procedure, transportation of freight is not keeping up. “Developing countries are seeing the opportunity that upgrading their infrastructure can bring, and many are putting higher priority on their infrastructure than we are,” he said. Nagle showed statistics that Singapore, Brazil, Japan and the European Union all spend more per capita on infrastructure improvement than the United States. Panama Expansion Means Bigger Ships When the expansion of the Panama Canal is complete in time to mark its 100th anniversary in 2014, it will have locks that accommodate vessels up to 1,200 feet long, 160 feet wide and with a draft of 50 feet. The canal now handles vessels no larger than 965 feet long, 106 feet wide and with a draft of 39.5 feet. “But unless the United States does a better job of maintaining its navigation channels through dredging and improvement of its locks and dams, our channel dimensions will not keep pace with larger ships,” Nagle said. “And we will not realize the full advantage of the export opportunities the expanded Panama Canal will bring. The lower Mississippi River is a poster child of the inadequate maintenance of federal navigation channels.” Exports Mean US Jobs, Global Competitiveness The speakers both emphasized that international trade creates and maintains American jobs and that it is shortsighted for the United States not to have an infrastructure that takes full advantage of the growing economic potential that world trade represents. Nagle said that seaports support 13 million jobs, and every billion dollars in exports means 15,000 jobs. “Free trade creates jobs,” Eriksen said. “Farmers spend months every year raising and taking care of the pile of grain you produce, but you don’t recognize the full value of your grain until it is transported. Transportation inefficiency devalues grain and causes bottlenecks that back up all the way to the farm gate.” Eriksen and Nagle both applauded the administration’s commitment to doubling exports by 2014, but emphasized that it will take infrastructure improvements to realize that goal.

### Links – Ports

#### **Ports increases the amount of corn to ethanol production**

Nachtmann and Pohl 11, Heather Nachtmann and Letitia Pohl 2011 [July Ph.D. from Arkansas and writers for the Mack-Blackwell Rural Transportation Center and the National Transportation Security Center of Excellence “Sustaining Resilient Inland Waterways via Renewable Energy” <http://www.uark.edu/rd_engr/MBTC/MBTC_DHS_1108.pdf>]

Over 60% of farm exports move on inland waterways, which translates to nearly 80 million tons of grain that move by barge annually (USACE, 2009). In contrast, almost all domestic shipments of grain are moved by either truck or short line rail. This difference in mode selection is due to the savings barge travel affords when travel distances are long, as in trips from the upper Midwest to a Gulf Coast seaport. As the domestic market for grain dramatically increases (primarily due to ethanol production increases), the trend is towards a greater reliance on trucking for grain shipment. This has led to increasing concern with the wear and tear on rural roads and bridges, and has motivated advocacy for inland waterway use for domestic grain shipments (Frittelli, 2005). Currently, about 90% of exported corn and the bulk of exported soybeans are moved by barge, since these crops are grown relatively close to the Upper Mississippi, Illinois and Ohio Rivers (Frittelli, 2005). Nearly 500 U.S. grain transfer facilities (see Figure 6) are served by water transportation, with over 125 facilities located on the Upper Mississippi River and the Illinois Waterway (USACE, 2005). This high barge traffic has resulted in congestion on critical waterways and wait times at the locks. Because of this, a major infrastructure improvement project under Congressional consideration is enlargement of the locks on the Upper Mississippi River and Illinois Waterway to make grain barge travel more efficient (Frittelli, 2005). Disruptions in this trade route could increase delays and have significant economic impact on the agricultural and waterways communities, particularly given the perishability of agricultural products. The future of the U.S. grain export market is dependent on a number of complex issues. An Institute of Water Resources study, which attempts to forecast grain shipments on the Upper Mississippi River, identifies three key changes occurring in the world grain trade which could impact both foreign demand and U.S. surplus: Brazil’s soybean sector, China’s agricultural import demand, and domestic ethanol production (Wilson et al., 2006). Future developments, while uncertain, have the potential to greatly impact the U.S. grain export market, thereby affecting the quantity of grain exports shipped on the rivers.

### Links – Rail

#### New Rail systems revitalize corn production

MWBC 8 2008 (Montana Wheat and Barley Committee, “Montana Rail Grain Transportation Survey and Report 2007 Prepared for the Montana Wheat & Barley Committee in co-operation with Montana Department of Transportation,” http://wbc.agr.mt.gov/Producers/2007MRGTsurvey.pdf)

The reported yields by the respondents to the study clearly showed this variance in production. Elevators were often "plugged," that is, they could not accept more grain because they were at full capacity. Rail service problems in the view of the farm producers appear to be a major cause of these conditions, which occurred despite the fact that rail rates and charges on Montana grain shipments are extremely high.

While economists do not expect railroads to carry a fleet of cars sufficient to meet peak demand, with the sequencing of grain harvest south to north on the Great Plains, there continues to be annual shortages of rail equipment when it is needed. The railroads appear to be stepping up their efforts by surveying and planning with growers and grain companies to better anticipate the harvest movements into the elevators.

### Links – Roads

#### Road Infrastructure key to corn commodity prices

TMC News 07 (http://www.tmcnet.com/usubmit/2007/02/13/2334974.htm)

Corn imports are assessed 12 percent import duty on CIF basis, plus a variable levy applied under the Price Band System. The Price Band System is a variable levy that depends on international prices, which assures that the import price of specific commodities, after payment of the levy, will equal a predetermined minimum import price. This tax, which is imposed on certain "sensitive" products, is expressed in dollars per metric ton. Currently the variable levy for corn is zero due to high international prices. Under the TPA, Peru has committed to eliminate the price band system will be eliminated for U.S. products. Under the TPA, which is pending approval by the U.S. Congress, the U.S. will have a duty free TRQ of 500,000 MT for U.S. corn, with annual increases of six percent and full duty free access in 12 years. The GOP does not have any direct subsidy or assistance program to encourage corn production. However, there has been some support through rotating credit funds. The Ministry of Agriculture continues to support an agreement between corn and poultry producers to encourage corn production in the eastern region of the country. This area is excellent for corn production, but transportation infrastructure is poor and in some cases does not exist.

### Links – Traffic

#### Traffic congestion is collapsing the biofuel market

Hajibabai 11 Leila (Graduate Research Assistant Department of Civil and Environmental Engineering University of Illinois at Urbana-Champaign) Yanfeng Ouyang (Associate Professor Department of Civil and Environmental Engineering University of Illinois at Urbana-Champaign) 2011 (http://amonline.trb.org/1sgpj3/1)

As the biofuel industry continues to expand, the construction of new bio-refinery facilities induces a huge amount of biomass feedstock shipment from supply points to the refineries and biofuel shipment to the consumption locations, which increases traffic demand in the transportation network and contributes to additional congestion (especially in the neighborhood of the refineries). Hence, it is beneficial to form public-private partnerships to simultaneously consider transportation network expansion and biofuel supply chain design in order to mitigate congestion. This paper presents an integrated mathematical model for biofuel supply chain design where the optimum number and location of biorefinery facilities, the optimal routing of biomass and biofuel shipments, and possible highway/railroad capacity expansion are determined. The objective is to minimize the total cost for biorefinery construction, transportation infrastructure expansion, and transportation delay (for both biomass/biofuel shipment and public travel) under congestion. A genetic algorithm framework (with embedded Lagrangian relaxation and traffic assignment algorithms) is developed to solve the optimization model, and an empirical case study for the state of Illinois is conducted with realistic biofuel production data. The computational results show that the proposed solution approach is able to solve the problem efficiently. Various managerial insights are also drawn.

## Impacts

### Food Prices

#### Biofuels like ethanol lead to record level food prices

The Guardian 8, secret report: biofuel caused food crisis, july 4 2008, <http://www.guardian.co.uk/environment/2008/jul/03/biofuels.renewableenergy?gusrc=rss&feed=networkfront>

Biofuels have forced global food prices up by 75% - far more than previously estimated - according to a confidential World Bank report obtained by the Guardian.

The damning unpublished assessment is based on the most detailed analysis of the crisis so far, carried out by an internationally-respected economist at global financial body.

The figure emphatically contradicts the US government's claims that plant-derived fuels contribute less than 3% to food-price rises. It will add to pressure on governments in Washington and across Europe, which have turned to plant-derived fuels to reduce emissions of greenhouse gases and reduce their dependence on imported oil.

Senior development sources believe the report, completed in April, has not been published to avoid embarrassing President George Bush.

"It would put the World Bank in a political hot-spot with the White House," said one yesterday.

The news comes at a critical point in the world's negotiations on biofuels policy. Leaders of the G8 industrialised countries meet next week in Hokkaido, Japan, where they will discuss the food crisis and come under intense lobbying from campaigners calling for a moratorium on the use of plant-derived fuels.

It will also put pressure on the British government, which is due to release its own report on the impact of biofuels, the Gallagher Report. The Guardian has previously reported that the British study will state that plant fuels have [played a "significant" part in pushing up food prices](http://www.guardian.co.uk/environment/2008/jun/19/climatechange.biofuels) to record levels. Although it was expected last week, the report has still not been released.

"Political leaders seem intent on suppressing and ignoring the strong evidence that biofuels are a major factor in recent food price rises," said Robert Bailey, policy adviser at Oxfam. "It is imperative that we have the full picture. While politicians concentrate on keeping industry lobbies happy, people in poor countries cannot afford enough to eat."

Rising food prices have pushed 100m people worldwide below the poverty line, estimates the World Bank, and have sparked riots from Bangladesh to Egypt. Government ministers here have described higher food and fuel prices as "the first real economic crisis of globalisation".

President Bush has linked higher food prices to higher demand from India and China, but the leaked World Bank study disputes that: "Rapid income growth in developing countries has not led to large increases in global grain consumption and was not a major factor responsible for the large price increases."

Even successive droughts in Australia, calculates the report, have had a marginal impact. Instead, it argues that the EU and US drive for biofuels has had by far the biggest impact on food supply and prices.

Since April, all petrol and diesel in Britain has had to include 2.5% from biofuels. The EU has been considering raising that target to 10% by 2020, but is faced with mounting evidence that that will only push food prices higher.

"Without the increase in biofuels, global wheat and maize stocks would not have declined appreciably and price increases due to other factors would have been moderate," says the report. The basket of food prices examined in the study rose by 140% between 2002 and this February. The report estimates that higher energy and fertiliser prices accounted for an increase of only 15%, while biofuels have been responsible for a 75% jump over that period.

It argues that production of biofuels has distorted food markets in three main ways. First, it has diverted grain away from food for fuel, with over a third of US corn now used to produce ethanol and about half of vegetable oils in the EU going towards the production of biodiesel. Second, farmers have been encouraged to set land aside for biofuel production. Third, it has sparked financial speculation in grains, driving prices up higher.

Other reviews of the food crisis looked at it over a much longer period, or have not linked these three factors, and so arrived at smaller estimates of the impact from biofuels. But the report author, Don Mitchell, is a senior economist at the Bank and has done a detailed, month-by-month analysis of the surge in food prices, which allows much closer examination of the link between biofuels and food supply.

The report points out biofuels derived from sugarcane, which Brazil specializes in, have not had such a dramatic impact.

Supporters of biofuels argue that they are a greener alternative to relying on oil and other fossil fuels, but even that claim has been disputed by some experts, who argue that it does not apply to US production of ethanol from plants.

"It is clear that some biofuels have huge impacts on food prices," said Dr David King, the government's former chief scientific adviser, last night. "All we are doing by supporting these is subsidising higher food prices, while doing nothing to tackle climate change."

### Monocultures

Biofuel production leads to monocultures   
Business Green 8, Andrew Charlesworth, 07/04/08, “Biofuels push up food prices, says report,” [http://www.businessgreen.com/ business-green/news/2220780/ biofuels-push-food-prices](http://www.businessgreen.com/business-green/news/2220780/biofuels-push-food-prices)

ActionAid estimates that the 82 per cent rise in food prices since 2006 has put 760 million people at risk of hunger in addition to the 100 million who have been pushed below the dollar-a-day poverty level. “The rise of biofuel production and the increasing impact of climate change coupled with an unparalleled decrease in [agricultural](http://www.businessgreen.com/bg/news/1806595/biofuels-push-food-prices-report) aid are creating a triple whammy for poor countries,” said Tom Sharman, Action Aid policy officer. Biofuel subsidies to US and EU farmers are worth between $16bn (£8bn) and $18bn (£9bn) a year, says the report. Consequently, grain and vegetable oil are being diverted to biofuels, leading to scarcity and rocketing prices. In the developing world, land on which farmers and pastoralists produce food is being converted to biofuel monocultures. The result, according to ActionAid, is that about 260 million people are either hungry or at risk of hunger because of biofuels. The charity is calling for all biofuels subsidies and targets to be removed and a five-year moratorium imposed on the diversion of arable land into biofuel mono-cropping.

#### Extinction

Coyne and Hoekstra 07Jerry, professor of ecology and evolution @ University of Chicago, and Hopi E, John L. Loeb associate professor in dept of organismic and evolutionary biology @ Harbard and curator of mammals @ Harvard’s Museum of Comparative Zoology, Weekend Australian, November 10, Lexis Nexis

Aside from the Great Dying, there have been four other mass extinctions, all of which severely pruned life's diversity. Scientists agree that we're in the midst of a sixth such episode. This new one, however, is different and, in many ways, much worse. For, unlike earlier extinctions, this one results from the work of a single species, Homo sapiens.

We are relentlessly taking over the planet, laying it to waste and eliminating most of our fellow species. Moreover, we're doing it much faster than the mass extinctions that came before. Every year, up to 30,000 species disappear due to human activity alone. At this rate, we could lose half of Earth's species in this century. And, unlike with previous extinctions, there's no hope that biodiversity will recover, since the cause -- us -- is here to stay.

To scientists, this is an unparalleled calamity, far more severe than global warming which is, after all, only one of many threats to biodiversity. Yet global warming gets far more press. Why? One reason is that, while the increase in temperature is easy to document, the decrease of species is not. Biologists don't know, for example, exactly how many species exist on Earth. Estimates range widely, from three million to more than 50million, and that doesn't count microbes, critical (albeit invisible) components of ecosystems. We're not certain about the rate of extinction, either; how could we be, since the vast majority of species have yet to be described? We're even less sure how the loss of some species will affect the ecosystems in which they're embedded, since the intricate connection between organisms means that the loss of a single species can ramify unpredictably.

But we do know some things. Tropical rainforests are disappearing at a rate of 2 per cent a year. Populations of most large fish are 10 per cent of what they were in 1950. Many primates and all great apes, our closest relatives, are nearly gone from the wild. And we know that extinction and global warming act synergistically.

Extinction exacerbates global warming: by burning rainforests, we're not only polluting the atmosphere with carbon dioxide (a greenhouse gas) but destroying the plants that can remove this gas from the air. Conversely, global warming increases extinction, directly (killing corals) and indirectly (destroying the habitats of Arctic and Antarctic animals). As extinction increases, then, so does global warming, which in turn causes more extinction and so on, into a downward spiral of destruction.

Why, exactly, should we care? Let's start with the most celebrated case: rainforests. Their loss will worsen global warming, raising temperatures, melting icecaps and flooding coastal cities. And, as the forest habitat shrinks, so begins the inevitable contact between organisms that have not evolved together, a scenario played out many times and one that is never good. Dreadful diseases have successfully jumped species boundaries, with humans as prime recipients. We have got AIDS from apes, severe acute respiratory syndrome from civets and Ebola from fruit bats. Additional worldwide plagues from unknown microbes are a real possibility.

But it isn't just the destruction of the rainforests that should trouble us. Healthy ecosystems the world over provide hidden services such as waste disposal, nutrient cycling, soil formation, water purification and oxygen production. Such services are best rendered by ecosystems that are diverse. Yet, through intention and accident, humans have introduced exotic species that turn biodiversity into monoculture.

Fast-growing zebra mussels, for example, have outcompeted more than 15 species of native mussels in North America's Great Lakes and have damaged harbours and water-treatment plants. Native prairies are becoming dominated by single species (often genetically homogenous) of corn or wheat. Thanks to these developments, soils will erode and become unproductive which, along with temperature change, will diminish agricultural yields. Meanwhile, with increased pollution and run-off, as well as reduced forest cover, ecosystems will no longer be able to purify water, and a shortage of clean water spells disaster

### Phosphorous

#### Corn production leads to phosphorous shortages

Keane 10 Eamon Keane 2010 (undergraduate degree in Mechanical Engineering and a master's degree in Energy Systems, graduating both with first class honours. He is starting a PhD investigating how electric vehicles will interact with the grid in Ireland. http://seekingalpha.com/article/182522-taking-stock-of-phosphorus-and-biofuels)

Finally, onto the connection with biofuels. As I said at the start, all organisms need phosphorus for their DNA, RNA & for ATP. Algae are no different. They require a constant supply of just the right quantity and ratio of nitrogen, phosphorus and potassium for optimium growth just like any other crop. I tried to estimate what quantity of phosphorus algae would require to reach certain goals. This brings into question the rather vexed question of yields. Algae proponents, such as the algae companies, claim yields per acre way in excess of any traditional crop. Their figures imply very high photosynthetic efficiencies. There are some who don't buy it. Take the June 2009 [paper](http://www.springerlink.com/index/p3064x5344334w37.pdf)by David Alan Walker, a professor of photosynthesis, in the Journal of Phycology (phycology is the study of algae). He states:

It is frequently claimed that green algae are intrinsically more productive, often by orders of magnitude, than higher plants commonly grown as crops for food. There is no firm evidence for this belief. On the contrary, there is much experience which shows that algae are not more but less productive. He quotes a contact in the industry The highest numbers that I have seen based on large scale long production periods for Spirulina are in the range of 4 t per 1,000 m−2. This is an equivalent to a daily productivity of 12–14 g m−2 d−1 and a total of about 300 days of operation. Most of the production facilities are actually doing only 3 t. He rubbishes claims such as those made by GreenFuels Technologies of 37 times higher than corn and 140 times higher than soybeans. At any rate, he may be wrong and researchers may yet increase yields. So I took three yield scenarios as laid out in the DOE's '[National Algal Biofuels Technology Roadmap](http://e-center.doe.gov/iips/faopor.nsf/UNID/79E3ABCACC9AC14A852575CA00799D99/$file/AlgalBiofuels_Roadmap_7.pdf)' (although the DOE report recognizes that phosphorus may be THE roadblock, it doesn't attempt to quantify it). The two most commonly cited algae are [Spirulina](http://www.americanaquariumproducts.com/SpirulinaAlgae.html)and [Chlorella](http://www.naturalways.com/chlorella-nutritional-analysis.htm) which both have the exact same phosphorus content of 0.895% dry weight. As is evidenced, algae will require quite a lot of phosphorus. any information on it, it's conceivable strains with lower Although I couldn't find phosphorus intensity could be found. I'm far from a biologist but my inclination would be that any attempt to decrease phosphorus would decrease the yield. It is thus very clear that if algae are to play a meaningful role at the US and indeed world level, they need to recycle the phosphorus. However even in the run up to build capacity, the levels of phosphorus demand would likely have very detrimental effects on the world markets.

The result is War and extinction   
Heinberg 4 Richard Heinberg 4 Excerpt: Powerdown: Options and Actions for a Port-Carbon World. 2004. (http://www.energybulletin.net/node/2291)

Every time we humans have found a way to harvest a dramatically increased amount of food or fuel form the environment, we have been presented with a quantity of energy that is, if not entirely free, at least cheap and abundant relative to what we had previously. Each time, we have responded by increasing our population, and correspondingly, the load on the environmental systems that sustain us. The same pattern plays out with other species whenever they discover a significant temporary food subsidy. The behaviour has been observed so many times, in so many species and human societies, that it really has to be considered a standard response. If we refuse to power down, then nothing will help. After a while we will simply have no choice: we will compete for what is left (whether for oil, natural gas, water, or phosphates) or we will die. Plan Snooze simply leads us back to Plan War.

### ****Water Wars****

#### ****Ethanol lead to water scarcity****

Perlman 12Rachael Perlman 5/28/2012 (Cornell school of environmental science, staff writer at clean air task force <http://www.catf.us/blogs/biofuels/tag/water-scarcity/>)

This study, by Yang et al., is unique in that it uses LCA methods to comprehensively compare the environmental impact of gasoline and E85, taking into account 12 different environmental impacts (not just GHG emissions), as well as regional differences among 19 corn-growinga states. The 12 impact categories were: global warming, human health cancer, acidification, human health respiratory, human health noncancer, ozone layer depletion, eutrophication, smog formation, ecological toxicity, fossil energy consumption, water use, and land occupation. They assumed the E85 contained corn ethanol and was produced using a dry mill powered by natural gas. Much of their data for ethanol impacts was derived from a Life Cycle Inventory database from the USDA and applies to corn ethanol produced in 2005. Their E85 impacts vary from state to state, mainly based on differences in those states’ climate, soil, topography, and transportation logistics. The gasoline calculations were developed from weighted averages of crude oil data based off the oil’s origin and its share in U.S. oil imports. The fuel lifecycles included the following steps: feedstock production, shipment of the feedstock to the refinery, refining/conversion, fuel shipment to the refueling station, and vehicle use. By normalizing and weighting their 12 categories, they also combined their results to a single environmental damage score, which they tested for sensitivity to develop one useful “weighted environmental impact” metric. The study found that gasoline has a better environmental impact score than E85 in terms of eutrophication, water use, and land occupation, with a slight advantage for smog formation and acidification effects as well. However, E85 was seemingly better in terms of fossil fuel energy consumption and global warming impact, and had a slightly smaller ecological toxicity. For the two fuels, no clear difference was found for ozone layer depletion, cancer and noncancer human health, and respiratory effects. From a geographic standpoint, E85 from different states had variable eutrophication, water use, land occupation, and global warming impacts, since regional agricultural practices (e.g. dependence on irrigation), climate and topography were quite different. Consequently, there is much error in trying to determine the nation-wide water use or eutrophication impact that corn-ethanol has on the environment. In any case, though, E85 has a much larger need for water than gasoline, given that irrigation is sometimes used and water is needed for the ethanol conversion process. Yang et al. concludes that, overall, according to their weighted average, E85 has between a 6% to 108% (23% average) greater total environmental impact than gasoline, and that this range becomes 16%-188% (33% average) when indirect land use change data (associated with uncertainty) is incorporated.

#### **Water Scarcity leads to Water Wars**

Chris Arsenault 2011 Reporter with Inter Press Service news agency. He has also reported for CBC radio, the Halifax *Chronicle Herald,* BA in history and economics from Dalhousie University and an MA in history, from the University of British Columbia, where he was awarded the 2008/09 Phil Lind Fellowship.

After droughts ravaged his parents' farmland, Sixteen-year-old Hassain and his two-year-old sister Sareye became some of the newest refugees forced from home by water scarcity. "There was nothing to harvest," Hassain said through an interpreter during an interview at a refugee camp in Dadaab, Kenya which is housing 160,000 Somalis displaced by a lack of water. "There had been no rain in my village for two years. We used to have crops."   As global warming alters weather patterns, and the number of people lacking access to water rises, millions, if not billions, of others are expected to face a similar fate as water shortages become more frequent. Presently, Hassain is one of about 1.2 billion people living in areas of physical water scarcity, although the majority of cases are nowhere near as dire. By 2030, 47 per cent of the world’s population will be living in areas of high water stress, according to the Organisation for Economic Co-operation and Development's [Environmental Outlook to 2030 report](http://www.oecd.org/dataoecd/29/33/40200582.pdf). Some analysts worry that wars of the future will be fought over blue gold, as thirsty people, opportunistic politicians and powerful corporations battle for dwindling resources.  Dangerous warnings Governments and military planners around the world are aware of the impending problem; with the US senate issuing reports with names like Avoiding Water Wars: Water Scarcity and Central Asia’s growing Importance for Stability in Afghanistan and Pakistan. With rapid population growth, and increased industrial demand, water withdrawls have tripled over the last 50 years,[according to UN figures](http://www.siwi.org/sa/node.asp?node=159)."The war was also a reason why we left," Hassain said. "There was a lot of fighting near my village." "Water scarcity is an issue exacerbated by demographic pressures, climate change and pollution," said Ignacio Saiz, director of Centre for Economic and Social Rights, a social justice group. "The world's water supplies should guarantee every member of the population to cover their personal and domestic needs." "Fundamentally, these are issues of poverty and inequality, man-made problems," he told Al Jazeera.

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Of all the water on earth, 97 per cent is salt water and the remaining three per cent is fresh, with less than one per cent of the planet's drinkable water readily accessible for direct human uses. Scarcity is defined as each person in an area having access to less than 1,000 cubic meters of water a year. The areas where water scarcity is the biggest problem are some of the same places where political conflicts are rife, leading to potentially explosive situations. Some experts believe the only documented case of a "water war" happened about 4,500 years ago, when the city-states of Lagash and Umma went to war in the Tigris-Euphrates basin. But Adel Darwish, a journalist and co-author of Water Wars: Coming Conflicts in the Middle East, says modern history has already seen at least two water wars. "I have [former Israeli prime minister] Ariel Sharon speaking on record saying the reason for going to war [against Arab armies] in 1967 was for water," Darwish told Al Jazeera. Some analysts believe Israel continues to occupy the Golan heights, seized from Syria in 1967, due to issues of water control, while others think the occupation is about maintaining high ground in case of future conflicts. Senegal and Mauritania also fought a war starting in 1989 over grazing rights on the River Senegal. And Syria and Iraq have fought minor skirmishes over the Euphrates River. Middle East hit hard UN studies project that 30 nations will be water scarce in 2025, up from 20 in 1990. Eighteen of them are in the Middle East and North Africa, including Egypt, Israel, Somalia, Libya and [Yemen](http://english.aljazeera.net/indepth/spotlight/yemen/2011/02/20112286187300800.html). Darwish bets that a battle between south and north Yemen will probably be the scene of the next water conflict, with other countries in the region following suit if the situation is not improved. Yemen's capital Sanaa, from where president Ali Saleh left the country after he was injured [during protests](http://english.aljazeera.net/indepth/spotlight/yemen/), could effectively run out of water by 2025, hydrology experts say.   Water shortages could cost the unstable country 750,000 jobs, slashing incomes in the poorest Arab country by as much as 25 per cent over the next decade, according to a report from the consulting firm McKinsey and Company produced for the Yemeni government in 2010. Living in one of the driest countries on earth, Yemenis depend on fresh water from rapidly depleting underground aquifers and infrequent rainfall. "We expect many of the private wells to dry up soon," Yemen's then minister for water resources Abdul Rahman Fadhl Iryani, told The*Los Angeles Times* newspaper in 2009. "After that, we will have to find a new source, or keep drilling deeper." It is a story being repeated with various degrees of severity across the Middle East, parts of Asia and even the American south-west. Iryani recently resigned his post to protest president Saleh’s crackdown on protesters. Commentators frequently blame Yemen's problems on tribal differences, but environmental scarcity may be underpinning secessionist struggles in the country's south and some general communal violence. "My experience in the first gulf war [when Iraq invaded Kuwait] is that natural resources are always at the heart of tribal conflicts," Darwish told Al Jazeera. "The world Sharia [Islamic law] has its linguistic origins in 'water from a well'. The Nile is another potential flash point. In 1989, former Egyptian president Hosni Mubarak threatened to send demolition squads to a dam project in Ethiopia. The current tenuous political situation in Egypt means that "if the army wants to divert attention away from criticism it would probably do something against Ethiopia," Darwish said. "The Egyptian army still has jungle warfare brigades, even though they have no jungle." On the Nile, cooperation would benefit all countries involved, as they could jointly construct dams and lower the amount of water lost to evaporation, says Anton Earle, director of the Stockholm International Water Institute think tank. "If you had an agreement between the parties, there would be more water in the system," he told Al Jazeera. The likelihood of outright war is low, he says,  but there is still "a lot of conflict" which "prevents joint infrastructure projects from going ahead". Differing views Water scarcity, and potential conflicts arising from it, is linked to larger issues of population growth, increasing food prices and global warming. There are two general views about how these problems could unfold. The first dates back to the work of Thomas Malthus, an eighteenth century British clergyman and author who believed that: "The power of population is so superior to the power of the earth to produce subsistence for man, that premature death must in some shape or other visit the human race." In other words, more people and scant resources will invariably lead to discord and violence. Recent scholars, including Thomas Homer-Dixon, have analysed various case studies on environmental degradation to conclude that there is not a direct link between scarcity and violence. Instead, he believes inequality, social inclusion and other factors determine the nature and ferocity of strife. "Unequal power relations within states and conflicts between ethnic groups and social classes will be the greatest source of social tensions rising from deprivation," said Ignacio Saiz from the social justice group. "Water too often is treated as a commodity, as an instrument with which one population group can suppress another." Bolivia, South Africa, India, Botswana, [Mexico](http://english.aljazeera.net/focus/2010/03/201032982731685235.html) and even parts of the US have seen vigorous water related protests, says Maude Barlow, author of 16 books and a former senior adviser to the UN on water issues. "The fight over water privatisation in Cochobamba, Bolivia did turn into a bit of a water war and the army was called in," Barlow told Al Jazeera. "In Botswana, the government smashed bore holes as part of a terrible move to remove [indigenous bushmen] from the Kalahari desert. Mexico City has been forcibly taking water from the countryside, confiscating water sources from other areas and building fotresses around it, like it's a gold mine. In India, Coke will get contracts and then build fortresses around the water sources," taking drinking and irrigation water away from local people. "In Detroit 45,000, officially, have already had their water cut off." Human rights Strife over water, like conflicts more generally, will increasingly happen within states, rather than between them, Barlow says, with large scale agribusiness, mining and energy production taking control over resources at the expense of other users. Back in the Kenyan refugee camp, on the front line of the world’s water crisis, Hassain hopes to start a new life, away from the parched fields, dead cattle and social violence ruining communities in his native Somalia. "I have never been to school," he said. "I want to go now that I am here." Dealing with water refugees like Hassain is a global challenge, and it is expected to get worse. The IPPC, the UN panel which [analyses climate science](http://www.ipcc.ch/pdf/technical-papers/ccw/chapter1.pdf), concluded that: "Water and its availability and quality will be the main pressures on and issues for, societies and the environment under climate change." Dealing with these pressures will require improved technologies, political will and new ideas about how humans view their relationship with the substance that sustains life. "A human rights approach to water, for Hassain, means he doesn't have to accept his fate as some inevitable tragedy," said Ignacio Saiz. "People have the right to expect access to a basic life resource like water by virtue of being human, regardless of the social situation they are born into. Alongside the worrying development of water scarcity, I am hopeful that we will see increasing struggles to see access to water as a right, and not a priviledge."

#### One conflict over water would unleash a global nuclear war

WEINER, 1990 Prof at Princeton Department of Molecular Biology

[Johnathan, The Next 100 Years: Shaping the Fate of Our Living Earth, p. 214]

If we do not destroy ourselves with the A-Bomb and the H-Bomb, then we may destroy ourselves with the C-Bomb, the change Bomb. And in a world as interlinked as ours, one explosion may lead to the other. Already in the Middle East, from Northern Africa to the Persian Gulf and from the Nile to the Euphrates, tensions over dwindling water supplies and rising populations are reaching what many experts describe as a flashpoint. A climate shift in that single battle-scarred nexus might trigger international tensions that will unleash some of the 60,000 nuclear warheads the world has stockpiled since Trinity.

## AT: Common Arguments

### AT: X Export Good

#### Crowd-out from increased use of biofuels means no risk of a turn

Chen et. al. 10—Professor of Public Finance @ Feng Chia University (Taiwan)—AND Hsiao-I Kuo, Professor @ Department of Senior Citizen Service Management @ Chaoyang University of Technology (Taiwan)—AND Chi-Chung Chen, Professor in the Department of Applied Economics @ National Chung-Hsing University (Taiwan) (Sheng-Tung, “Modeling the relationship between the oil price and global food prices,” Applied Energy, Volume 87, Issue 8, August 2k10, Pages 2517–2525, ScienceDirect/Google Scholar, DA: 6/30/2012//JLENART)

The price of a single grain commodity may be affected by the prices of oil and other grain commodities in a number of ways. On the supply side, increases in the crude oil price push crop production costs and, therefore, shifts the supply curve of a grain commodity to the left, resulting in a price increase. Baffes [4] indicated that the crude oil price should be included in the aggregate production function for most primary agricultural commodities through the use of various energy-intensive inputs. For instance, the prices of fertilizer, fuel, and transportation were found to be affected by the crude oil price directly, and subsequently influenced the production of grain commodities. On the demand side, grain commodities are competing with the derived demand for bio-fuels. Since bio-fuels have very significantly impacts on environment and economy [5], governments from major agricultural production countries have implemented production subsidy to encourage farmers planting energy crops. For instance, as Runge and Senauer [6] observed, “a combination of high oil prices and even more generous government subsidies, corn-based ethanol has become the rage. The ethanol industry’s growth has meant that a larger and larger share of corn production is being used to feed the huge mills that produce ethanol.” Bio-fuel firms may thus have an incentive to produce ethanol or bio-diesel if the crude oil price remains at a higher level. Therefore, the higher crude oil price has induced a higher derived demand for corn or soybeans and has resulted in higher prices of corn and soybeans. The increase in the crude oil price has not only affected corn and soybean prices but also other agricultural commodities such as wheat and rice. Since the global cropland endowment is limited, the increase in the derived demand for corn or soybeans due to the increase in the oil price will expand their planted acreages and result a decrease in the planted acreage for wheat and rice.

## Aff Answers

### Non-Unique

#### Despite other uncertainties, the ethanol industry will do well

WSJ 7/23

(Wall Street Journal, “3rd Global Ethanol Focus 2012, Be Part of Your Ethanol Business”, Market Watch, 7/23/12, http://www.marketwatch.com/story/3rd-global-ethanol-focus-2012-be-part-of-your-ethanol-business-2012-07-23)

SHANGHAI, Jul 23, 2012 (BUSINESS WIRE) -- The 3rd Global Ethanol Focus 2012 (GEF2012), focusing on the Asian and global ethanol market, will be held at Millennium Hilton Bangkok, Thailand on September 19-20. ¶ The conference will cover supply situations in Brazil, US, Thailand, Vietnam and Pakistan, as well as ethanol demand in industry, beverage and fuel sectors. In addition, new ethanol technologies and their commercialization will be discussed, including coal-based ethanol, steel gas-based ethanol and cellulosic ethanol. ¶ It is expected that over 80 participants from all over the world will attend the conference, with 50% of them being ethanol producers, 24% international traders, 11% downstream users, 5% technical advisors, 4% government officers and 6% consultants & associations. ¶ As a platform to promote Asian and global ethanol business exchange, GEF provides an effective means of information sharing, networking, communication and business cooperation to all members in matters of general and specific interests. Beginning its activities in China in 2006 with the GEF China Ethanol Forum, GEF managed to expand its coverage to the global market in 2010. ¶ Although the economic and political uncertainties prevail in 2012, the ethanol industry will continue to be an exciting part of the global business and economy in the future. The world ethanol production and trade patterns have experienced big changes since 2011 and have welcomed new suppliers and consumers emerging from the globe in 2012.

#### Ethanol industry is expected to do well in 2012

Schill, 7/20

(Susanne Retka Schill, writer for the ethanol producer magazine, “EIA: US ethanol still likely to lead world export market”, Ethanol Producer Magazine, 7/20/12, <http://www.ethanolproducer.com/articles/8961/eia-us-ethanol-still-likely-to-lead-world-export-market>)

The U.S. ethanol industry is on track to be a net exporter of ethanol in 2012, although at lower levels that last year’s record. The U.S. Energy Information Administration (EIA) highlighted ethanol in its July 18 report, “This Week in Petroleum.” ¶ The EIA pointed to a number of factors that will influence the U.S. ethanol trade balance. “Sluggish gasoline demand, combined with ethanol blending limits, is currently restraining domestic consumption levels,” the report says. “At the same time, increased renewable fuel standard (RFS) mandates call for higher volumes in the fuel supply. In addition, sugarcane ethanol exported from Brazil looks to rebound from a low year in 2011 and compete with U.S. corn ethanol in the world market.” Though there will be uncertainty, EIA is projecting U.S. export volumes will remain significant and lead world trade in 2012.

#### The ethanol industry predicts a larger market.

McCoy, 6/29

(Daniel McCoy, reporter for Wichita Business Journal, “Ethanol industry hopes new fuel blend will ease struggles”, Wichita Business Journal, 6/29/12, <http://www.bizjournals.com/wichita/print-edition/2012/06/29/ethanol-industry-hopes-new-fuel-blend.html>)

The Environmental Protection Agency has issued final approval of a gasoline blend that is 15 percent ethanol, paving the way for retailers to sell it. There are still hurdles for the ethanol, paving the way for retailers to sell it. There are still hurdles for the ethanol industry to overcome before E15 sees widespread use. But after years of fighting to get the higher blend approved-most blended gas now is 10 percent ethanol-some in the ethanol industry think they are now closer to opening a larger market, one that could lift their recently struggling fortunes.

#### Ethanol industry is increasing, cne in china proves

Balashov, 7/18

(Sergei Balashov, writer for proactive inverstors,s “UPDATE: China New Energy secures £7.4m contract from JEIC”, Proactiveinvestors United Kingdom”, 7/18/12,

http://www.proactiveinvestors.co.uk/companies/news/45709/update-china-new-energy-secures-74m-contract-from-jeic-45709.html)

“CNE has a market leading position in China and a strong track record in the design and construction of ethanol plants; demonstrating the success of the EMC business is important going forward and has the potential to add significant value is this technology is able to be readily exported,” said analyst at Arden John Wilson.¶ In an interview with Proactive Investors, non-executive director of China New Energy Richard Bennett said he had no idea why the company’s share price has been under pressure over the past few months.¶ “We’re in a market that’s expanding, the industry is going to grow, plants have to be built and we are winning contracts in very tough times. Why our share price keeps coming under pressure I just got no idea,” said Bennett.¶ “This is obviously a very tough market but the ethanol industry is growing and we are expecting to see more growth as the year goes on,” he added.