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*Ending Injustices That Cause Hunger and Environmental Destruction*

## POLICY BRIEF No 13

**When Renewable Isn't Sustainable:  
Agrofuels and the Inconvenient Truths  
Behind the 2007 U.S. Energy Independence  
and Security Act**

**By Eric Holt-Giménez and Isabella Kenfield**

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## The Fracturing of the Agrofuels Consensus

Policymakers in the United States have turned up the heat on the agrofuels boom by setting ambitious targets for the nation's Renewable Fuels Standards (RFS). In December 2007, the *Energy Independence and Security Act* passed the House and Senate, and was signed into law by President George W. Bush. The Act, legislated in the political glow of a strong bi-partisan consensus, mandates the use of 36 billion gallons of agrofuels annually by 2022—a five-fold increase over present levels.

Politicians, both red and blue, are still gushing over the new green alternative, insisting agrofuels are vital to national energy security, will curb global warming, and are the next step in the nation's transition from peak oil to a renewable fuel economy. Closer analysis reveals that agrofuels provide few of these benefits. In fact, they are already exacerbating problems of hunger, poverty and ecological destruction. In this case, renewable does not mean "sustainable." For this reason, even in the face of the industry's breathtaking expansion, the social consensus on agrofuels is fracturing; locally, nationally and globally.

The fractures are reflected in the steadily eroding support for agrofuels among farmers, scientists, activists, non-governmental organizations and many communities. They are also reflected in decreasing rates of investment and recent public relations efforts by the industry.<sup>i</sup> Those still strongly in favor of agrofuels range from pro-industry academics—flush with corporate research money—to hard-strapped mid-western corn farmers who are experiencing economic prosperity for the first time in decades. They are supported by a powerful phalanx of multi-billion dollar industries, venture capital investors and politicians, eager to implement the legislation that House Speaker Nancy Pelosi heralded as "a shot heard 'round the world for energy independence."<sup>ii</sup>

**"Agrofuels"** are liquid fuels made from fuel crops grown on a large agro-industrial scale. Agrofuels, such as ethanol and biodiesel, are currently produced from plants such as corn, oil palm, soy, sugar cane, sugar beet, rapeseed, canola, jatropha, rice and wheat. Agrofuels are blended with gasoline or diesel, mainly to power the 800 million automobiles that consume over 50% of the world's energy.

**"Biofuels,"** the term commonly used for agrofuels, refers to small-scale, non-industrial liquid fuels frequently made in owner-operated facilities for local consumption.

This report concerns itself with industrial agrofuels, not small-scale biofuels.

### Agrofuels Expansion

In 2000, U.S. corn-based ethanol production was 1.6 billion gallons per year (BGY); in 2006, this number had increased by 300% to 4.8 billion BGY.<sup>1</sup> From 2000 to 2006 U.S. biodiesel production increased from 2 million gallons to 250 million gallons<sup>2</sup> and in 2007, the country's capacity for biodiesel production was over 2.2 BGY.<sup>3</sup> The boom shows no signs of easing up. This year, the U.S. will produce 8 billion gallons of ethanol; and over 10 billion by 2009.<sup>4</sup>

Opposition to agrofuels is coming largely from independent scientists, international food security experts, food sovereignty movements, conservationists, and, increasingly, from peri-urban communities that do not want ethanol plants in their backyards. But opposition is also growing among farmers, some oil companies, some environmentalists, and even a few politicians (albeit timidly), who are becoming

increasingly uncomfortable with the industrial fuel crop model.

The fractured consensus has uncovered agrofuels' "inconvenient truths," revealing a hydra-headed industrial juggernaut driven by giant grain, genetic engineering, and petroleum companies actively speculating with food and fuel systems at taxpayers' expense. Behind the heroic corporate claims of energy independence and green energy, the agrofuels boom is violently transforming food and fuel systems in the Americas and elsewhere.

This report, the first in an exhaustive series on *Food and Fuel Sovereignty in the Americas*, describes three aspects of agrofuels' inconvenient truths: food shortages, energy dependence, and environmental damage. In the face of the fracturing agrofuels' consensus, we propose a moratorium and a broad public dialog to build a context for sound food and fuel alternatives.<sup>1</sup> (See: <http://ga3.org/campaign/agrofuelsmoratorium>)

### **Food: The Canary in the Mineshaft**

In 2007 Lester Brown of Earth Policy Institute shocked the environmental policy community by stating flatly: "The grain required to fill a 25-gallon SUV gas tank with ethanol will feed one person for a year." Brown drew the U.S. into the "food versus fuel" debate that had long since erupted in Europe. The irony was that in 2006, *Worldwatch*—an institute founded by Brown—was instrumental in promoting the international spread of agrofuels by publishing "*Biofuels: Global Potential and Implications for Sustainable Agriculture and Energy in the 21st Century*," the first informative book exclusively devoted to fuel crops. Long on facts, *Biofuels* presents agrofuels as a sector with potential and pitfalls, but does not analyze their industrial impact on precarious global food systems. The United Nations Special Rapporteur on the Right to Food, Jean Ziegler, was much more direct. He called agrofuels a "recipe for disaster" and exhorted governments to implement a five year moratorium in order to provide time for "[a]n assessment of the potential impact on the right to food, as well as on other social, environmental and human rights, and should ensure that biofuels do not produce hunger."<sup>iii</sup>

The food versus fuel debate is a reflection of the harsh calculus of the multinational grain corporations. Under the RFS' promise of obligatory ethanol purchases (that essentially create a captive market) Archer Daniels Midland (ADM), Bunge, and Cargill diversified their monopsonistic

purchases to include corn for fuel as well as corn for food. Between 2001 and 2006, the amount of corn used in U.S. ethanol distilleries tripled; from 18 million tons to an estimated 55 million tons.<sup>iv</sup> Between

#### **Increase in Grain Prices**

In 2006, U.S. corn prices increased by 60% and world corn prices increased by more than 50%; U.S. prices for wheat and soybeans increased by 25% and 8%, respectively, and by 21% and 7% on the world market.<sup>1</sup> In the early months of 2008, prices for wheat and soybeans on the Chicago Board of Trade have hit all-time highs, double what they were a year ago. In mid-January, corn was trading over \$5 per bushel, close to its historic high.<sup>2</sup>

<sup>1</sup> Other policy reports in this series include: *Agrofuels and Global Trade*; *Agrofuels and Human rights*; *Agrofuels and International Finance Institutions*, *The Agrofuels and Environmental Justice*; *Agrofuels and Climate Justice*, *Agrofuels and Farmer Livelihoods*.

2006 and 2007, the increase in demand for corn from U.S. ethanol distilleries—from 54 to 81 million tons—was over twice the annual increase in global demand for the world's grain. At this rate, half of the U.S. corn harvest will be diverted to ethanol production by the end of 2008.<sup>v</sup> Because U.S. corn accounts for some 40% of global production, increased demand for U.S. corn as feedstock for fuel impacts global markets for corn as food.<sup>vi</sup> As demand for corn increases, more is planted, pushing out other food grains such as wheat and soybeans. With less land available for cultivation, the price of these products goes up. Because corn and soy are main ingredients for processed food and livestock feed, the increase in corn prices dramatically increases food prices worldwide.

In December 2007, the *Economist* reported that its food-price index was higher than at any time since it was created in 1845. Prices have jumped by 75% since 2005.<sup>vii</sup> By late 2007, the price of a loaf of whole wheat bread in the U.S. was 12% higher than one year earlier, milk was up 29%, and eggs were up 36%. In Mexico, corn meal prices are up 60%. In Pakistan, flour prices have doubled, and China is also facing rampant food price inflation.<sup>viii</sup> The world is down to only 54 days of grain reserves—the lowest on record.<sup>ix</sup>

While middle-income consumers in industrialized countries spend between 10-20% of their income on groceries, many poor consumers in the Global South spend between 50-80% of their income on food. These consumers are particularly vulnerable to rising and volatile food prices because, while these countries are usually net exporters of agricultural commodities, they are still net importers of food.<sup>x</sup> The Food and Agriculture Organization estimates that in 2006, developing countries' food import costs increased by 10% from 2005 and in 2007, food import prices rose by 25%.<sup>xi</sup>

As a result, many people in the Global South are taking to the streets. In the past year, the world has seen more protests over higher food prices than over fuel hikes.<sup>xii</sup> In 2007, there were food riots in Mexico over the skyrocketing prices of tortillas, rice riots in Senegal, and street demonstrations in Italy over higher prices for pasta. So far this year, higher wheat prices in Pakistan have led to smuggling and the need for troops to guard grain reserves. In January 2008, in Indonesia, police were forced to clear the streets due to food riots over rising soybean prices.<sup>xiii</sup> Conflicts are increasing.

The International Food Policy Research Institute (IFPRI) predicts that depending on rates of agrofuels expansion, by 2020, the global price of corn will increase by 26 to 72% and the price of oilseeds between 18 and 44%. "In both scenarios, rises in crop prices would lead to decreases in food availability and calorie consumption in all regions of the world, with Sub-Saharan Africa suffering the most."<sup>xiv</sup> Countries where corn is the major staple grain will be particularly affected by rising grain costs. One study estimates that, depending on ethanol expansion in the U.S., food basket costs in Mexico will rise between 10 to 20%, Mozambique will see food basket prices rise between 11 to 23%, and South Africa's food basket costs will rise between 9 and 19%.<sup>xv</sup> On March 6, 2008, Josette Sheeran, the Executive Director of the UN World Food Programme announced they were facing a US\$500 million shortfall just due to soaring food and fuel costs—up over 40% since June 2007, warning it would implement ration cuts unless the program received additional help.<sup>xvi</sup>

With every one percent rise in the cost of food, 16 million people are made food insecure. This has serious implications for the three billion people in the world living on less than \$2 a day, and for the 36 million hungry people in the United States that the USDA also terms “food insecure.” If current trends continue, some 1.2 billion people could be chronically hungry by 2025—double the current number and 600 million more than previously predicted.<sup>xvii</sup>

However, the physical substitution of fuel for food crops is only part of the reason food prices are climbing and food insecurity is increasing. The mainstream conventional wisdom claims that the food crisis is a combination of increasing global population, rising meat consumption in China and India, and soaring oil prices. In this quantitative view, agrofuels plays only a partial role. But this reasoning ignores the *driving industrial forces* behind agrofuels: big grain, big biotech, and, yes, even big oil. Industrial agriculture dominated by multinational corporations is largely responsible for creating a skewed global food system in which 1 billion suffer from obesity while 840 million people go hungry.<sup>2</sup> As the food crisis worsens, these corporate interests not only profit, they increase their global control over food and the resources needed to produce it. Agrofuels play a central role in increasing the market shares and articulating the market power of the same corporations of the industrial agri-foods complex that created the crisis in the first place.

For example, the agrofuels boom turns food crises into a doubly lucrative opportunity for grain merchants and grain processors. Because corporations like ADM and Cargill both buy and sell grain, they stand to gain from either low or high prices. When grain prices drop, they buy. Because of their market power they can withhold grain from the market—hoarding supplies until the price goes up again. When grain prices rise, they sell. This speculation was at the heart of the Mexican “Tortilla Crisis” in 2007. It makes no difference that white corn is used for tortillas and yellow corn for cattle feed. As agrofuels cut into the acreage planted to yellow corn, inflating its price, white corn was fed to cattle, taking it off the tortilla market and sending its price up as well. Grain merchants, like ADM and Cargill, and corn processors, like Mexico’s Maseca, raised their prices. When the Mexican government attempted to intervene with a price cap, these corporations responded by withholding grain from the market, exacerbating the problem. The incident illustrates how the agrofuels boom increases the market power of these corporations—a power summarily unchecked by governments.

Like the proverbial canary in the mineshaft, current food crises should be seen as a dire warning that something is terribly wrong with our food system. Unleashing the worldwide expansion of agrofuels with the RFS targets of the U.S. Energy Act will not fix what is wrong. On the contrary, it will make things much

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<sup>2</sup> In this system, food and raw materials from the Global South are exported and sold cheaply to obtain foreign exchange—largely to pay off chronic foreign debt. Many countries with hungry populations actually export food—78% of all malnourished children under five live in countries with food surpluses. See, “The Myth-Scarcity: The Reality—There IS Enough Food,” Food First Backgrounder, Spring 1998, Vol. 5, No. 1, and “12 Myths about Hunger,” Food First Backgrounder, Summer, 2006, [www.foodfirst.org](http://www.foodfirst.org).

worse. The agrofuels boom is a dangerous strategy that consolidates the tremendous market power of the industrial agrifoods complex—precisely when it needs to be dismantled.

### **From Oil Dependency to Agrofuel Dependency: The Hidden Agenda**

Despite massive increases in U.S. ethanol production, the RFS targets—36 billion gallons per year by 2022—far exceed the U.S.’ current capacity for fuel crop production. Of the mandate, less than half—15 billion gallons—will come from corn ethanol. Achieving this volume will require 45 million acres—nearly 50 percent of the country’s current corn acreage. (Even if all of the U.S.’s 90 million-acre corn crop were converted to ethanol, just 12-16% of our gasoline would be replaced—barely enough for current ten percent ethanol blends (E-10), much less the 98% blends suggested in the Energy Bill.<sup>xviii</sup>)

The remaining 21 billion gallons in the RFS are defined as “advanced biofuels.” This futuristic sounding term actually includes *any* fuel crop other than corn, including soybeans, oil palm, sugarcane and jatropha. While politicians have pinned their hopes on cellulosic ethanol made from native grasses or genetically-engineered (GE) fast-growing trees, by most accounts these fuels will need years and billions of dollars in research and infrastructure development to become commercially viable.<sup>xix</sup> The 36 billion gallon mandate only replaces some 7% of our current fuel use—about 1.5 million barrels of oil per day.<sup>xx</sup> Regardless of the technology, the next inconvenient truth lurking in the 2007 U.S. Energy Act is that the United States is geographically incapable of producing enough agrofuels to meet the RFS mandate. According to the Organization for Economic Cooperation and Development (OECD), North America has no significant additional cropland available for agrofuels.<sup>xxi</sup> *Politicians are planning to buy agrofuels from the Global South to make up the shortfall.*

#### **The North-South Connection**

In the short run, many governments in the Global South are eager to oblige the U.S.’s energy appetite—even at the expense of local food security. In Colombia, where 40% of the population was food insecure in 2006, the government is increasing palm-oil plantations from 2.5 to 15 million acres in order to supply the U.S. agrofuels market.<sup>1</sup> According to an official from Colombia’s Ministry of Agriculture, “Colombia cannot compete with U.S. crops, and facing the possibility of numerous free trade agreements, we decided to look for another export product. Palm was the answer. Palm is the future. The demand is expected to be very large.”<sup>2</sup> Brazil—the world’s largest exporter of ethanol—is planning to increase acreage planted to sugarcane fivefold in order to replace 10% of the world’s gasoline by 2025, despite the fact that more than one-quarter of the country’s population is food insecure.<sup>3</sup>

This is why the term “advanced agrofuels” is strategically vague. It must include imported agrofuels, primarily from Latin America. According to the OECD, 84% of the world’s additional land available for agrofuels is in South America and Africa.<sup>xxii</sup> Astonishingly, this fact is not mentioned in the media, or by our politicians. This is despite the fact that in 2006, imported ethanol accounted for 13.5% of ethanol used in the U.S.. Countries that export ethanol to the U.S. include Costa Rica, El Salvador, Jamaica, Trinidad-Tobago, and Brazil, our major supplier. In 2005, the U.S. imported 31 million gallons of ethanol from Brazil. Then, in 2006, Brazilian imports jumped to 434 million gallons.<sup>xxiii</sup> Rather than ensuring energy

independence, the RFS mandate reflects an agreement between industry and politicians to legislate the U.S.'s *dependency* on imported agrofuels.<sup>xxiv</sup> <sup>3</sup>

*When the road to energy independence is an expensive dead end*

The need to reduce U.S. dependence on foreign oil has led many people to embrace agrofuels as a replacement for fossil fuels. Some assert that agrofuels will help moderate high oil prices or even help conserve oil.<sup>xxv</sup> But agrofuels are an additive, not a replacement. Far from providing a transition from our dependence on petroleum to renewable energy sources, the agrofuels boom will simply *extend* the present petroleum-based economy and the era of peak oil—with all of its negative consequences. Why pursue this option? Because with an estimated one trillion barrels of oil reserves left on the planet, the price of oil is hovering at \$100-a-barrel. The higher the oil prices, the more ethanol costs can rise while remaining competitive. With agrofuels, the planet's energy crisis is potentially an \$80 - \$100 trillion bonanza for both Big Oil and Big Grain companies.<sup>xxvi</sup> Rather than conserving, this strategy allows oil companies to pump every last drop of oil from reserves in the world's hard to reach, environmentally fragile areas, inviting us to consume our way out of over-consumption. There will be no renewable "transition" with agrofuels; only a longer, more expensive road to the oil economy's inevitable dead end.

*Taxpayer dollars feeding our other dependency: Big Grain*

The big drivers of the agrofuels boom are the multinational corporations in the agribusiness, petroleum, biotech and automotive industries seeking to extend their market power. Over the past three years, venture capital investment in agrofuels has increased by nearly 700%.<sup>xxvii</sup> Private investment in agrofuels is pouring in to public research institutions, setting the agenda not only for agrofuels, but for public research in general.<sup>xxviii</sup> New corporate partnerships are being formed between agribusinesses, biotechnology companies, oil companies and car manufacturers.<sup>xxix</sup> Billions of dollars are being invested in the agrofuel sector in a development often likened to a 'green goldrush,' in which countries are rapidly turning land over to agrofuel crops and developing infrastructure for processing and transporting them. While the rest of the world is heading into economic recession, these corporations are expanding and making unprecedented profits. How? Taxpayer dollars.

Archer Daniels Midland, the largest U.S. (and multinational) grain processor, now gets 25% of its operating profit from agrofuels, including both ethanol and biodiesel.<sup>xxx</sup> In anticipation of passage of the Energy Bill, ADM's stock surged nearly 20% from August to mid-December.<sup>xxxi</sup> The company announced that it was "optimistic about the expanded role [agrofuels] will play in improving energy security, strengthening rural economies and helping to improve our environment."<sup>xxxii</sup>

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<sup>3</sup> Agrofuels dependency not only links our energy consumption to access to resources in other countries, it connects us to the ways those resources are produced. The sugar cane and oil palm industries in Brazil, Colombia and other agrofuel producing countries are guilty of systematic labor and human rights violations—including land dispossession and slavery. Our dependency on their feedstock serves to perpetuate, not alleviate these injustices. See Food First Backgrounder "Colombia palm oil biodiesel plantations: A "lose-lose" development strategy?" and our upcoming report "Agrofuels and Human Rights."

In order to establish the international agrofuels market, these corporations require extensive government subsidies, tariffs and tax breaks. Corn and soybeans are the most subsidized crops in the U.S., raking in a total of \$51 billion in federal handouts between 1995 and 2005. Ethanol subsidies amount to as much as \$1.38 per gallon—about half of its wholesale market price.<sup>xxxiii</sup> In 2006, the combined state and federal support for the U.S. ethanol industry was between \$5.1 and \$6.8 billion.<sup>xxxiv</sup> According to Don Briggs, president of the Louisiana Oil and Gas Association, the 2007 U.S. Energy Bill is “a giant ethanol subsidy.”<sup>xxxv</sup>

“The ethanol boondoggle is largely a tribute to the political muscle of a single company: agribusiness giant Archer Daniels Midland,” states a recent *Rolling Stone* article. ADM has a historic and large presence in Washington. In the 1970s, as ADM began searching for ways to diversify profits from corn, the corporation began producing ethanol. ADM established a relationship with Sen. Bob Dole of Kansas, a.k.a. “Senator Ethanol.” During the 1992 election, ADM gave \$1 million to Dole and his friends in the GOP (compared with \$455,000 to the Democrats). In return, Dole helped the company secure billions of dollars in subsidies and tax breaks. In 1995, the conservative Cato Institute, estimating that nearly half of ADM’s profits came from products either subsidized or protected by the federal government, called the company ‘the most prominent recipient of corporate welfare in recent U.S. history.’ Since 2000, the company has contributed \$3.7 million to state and federal politicians.<sup>xxxvi</sup>

#### *The agrofuels industry: Concentrated growth*

According to the Renewable Fuels Association (RFA), the ethanol industry’s lobbying group, out of a total of 134 operational ethanol processing plants in the U.S., 49 are presently farmer-owned associations, accounting for 28% of the nation’s total capacity. That is rapidly changing. Out of a total of 77 plants now under construction, 88% are owned by large corporations. When completed, the farmer owned percentage of total plant capacity will fall to less than 20% (note: RFA and the USDA were recently accused of underreporting the number of ethanol plants under construction,<sup>xxxvii</sup> so the degree of corporate control may well be higher). Five corporations control roughly 47% of all ethanol production in the U.S. ADM and POET, the two largest corporate ethanol producers, control 33.7% of all ethanol production. The top 10 producers together control an estimated 70 percent.<sup>xxxviii</sup> Because of the economies of scale of its plants, and the fact that it can dominate the grain market in both food and fuel crops, ADM is emerging as the hegemonic player in the U.S. While other ethanol companies are struggling with shrinking margins due to high corn prices, ADM has strengthened its market share, and its profits.<sup>xxxix</sup>

Concentration of ownership of global agrofuels production by U.S. agribusiness is proceeding apace. Having recently bought the majority shares in Brazil’s largest ethanol distillery, U.S.-based Cargill is now the largest shipper of both raw sugar and soybeans from Brazil—the former for ethanol feedstock, the latter either feed or biodiesel. Cargill also has the largest capacity for processing oil seeds in Paraguay.<sup>4</sup>

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<sup>4</sup> With an estimated 13 silos and an illegal port facility built in the Amazon, Cargill is leading soy’s invasion into the region - spurring the incursion of illegal farms and infrastructure to deliver soy to global markets. In 2005, Cargill became the majority shareholder of two palm oil plantations in Indonesia, on the islands of Sumatra and Borneo, and three more in Papua New Guinea. [www.cargill.com](http://www.cargill.com)

The prospects for consolidating corporate monopolies through the agrofuels boom are staggering. New corporate partnerships and mergers are being formed at a dizzying rate: ADM with both Monsanto and Conoco-Phillips; BP with DuPont and Toyota, as well as with Monsanto and Mendel Biotechnology; Royal Dutch Shell with Cargill, Syngenta, and Goldman-Sachs, and DuPont with British Petroleum and Weyerhaeuser.<sup>xi</sup> In June 2007, BP, Associated British Foods, and chemicals producer DuPont Co. announced that they will invest \$400 million to build an agrofuels plant in England.<sup>xii</sup>

### **Agrofuels: Renewable ... but not Green**

Before the advent of electricity and hydropower, much of the Western world lit their lamps with oil rendered from the blubber of whales, a “renewable” resource that the whaling industry nearly drove to extinction.<sup>5</sup> Confusing the term “renewable” with the notion of a green, sustainable fuel hides yet another inconvenient truth: Agrofuels targets in the industrial North are leading to massive environmental destruction in the Global South. Millions of hectares of tropical forests, grasslands, and peat lands around the world are rapidly being cleared and burned to plant fuel crops for export.

Far from being “clean and green,” agrofuels simply perpetuate the agroindustrial model—already a major contributor to greenhouse gas (GHG) emissions, pollution, and water depletion. Land use changes, agricultural production and transportation combined account for 46% of total GHG emissions.<sup>xiii</sup> In February 2008 a *Science* journal article reported that agrofuels cause more greenhouse gas emissions than conventional fuels if the full emissions costs of producing these “green” fuels are taken into account, from land clearing to consumption.<sup>xiii</sup> Deforestation sends more carbon dioxide into the atmosphere than all the world’s planes, trains, trucks and automobiles, accounting for about 20% of anthropogenic emissions.<sup>xiv</sup> Every ton of palm oil generates 33 tons of carbon dioxide emissions—10 times more than petroleum. Because clearing releases carbon trapped in the vegetation, tropical forests cleared for sugar cane ethanol emit 50% more GHG emissions than the

#### **Biotech’s monopoly profits**

As with Big Oil and Big Grain, Big Biotech is harvesting record profits from the agrofuels boom. In January, financial results showed that Monsanto’s stock appreciated 137% in 2007, hitting a record on the New York Stock Exchange. In the first fiscal quarter of 2008, Monsanto’s revenue jumped 36% to \$2.1 billion, far surpassing the \$1.54 billion in revenue in the same quarter last year.<sup>1</sup> Monsanto’s rising stock value helped raise the value of Syngenta’s shares.<sup>2</sup> In February, Syngenta released its 2007 results, showing an 11% increase in sales to \$9.2 billion. For both corporations, Latin America figures prominently: the region was Syngenta’s “star performer” in 2007, where sales of pesticides, herbicides and seeds increased by 37%—higher than in any other region.<sup>3</sup> Growth in Brazil has been particularly large; Syngenta’s sales in Brazil increased for all products, while Monsanto doubled its corn-seed sales to farmers in the country, where its sales of the herbicide Roundup also surged.<sup>4</sup> Both companies attributed this growth to the expanding agrofuels industry.

<sup>5</sup> Even after petroleum replaced oil as the fuel of choice, because the whaling industry was financially committed to whale hunting, it continued to slaughter whales for years as it attempted to develop markets in non-essential items like corsets and perfume. This should serve a grim warning to those who believe in a smooth industrial transition from corn to 2<sup>nd</sup> generation ethanol...

production and use of the same amount of gasoline.<sup>xlv</sup> Fifty percent of global GHG emissions from changes in land use are generated in Indonesia and Brazil—two global leaders of agrofuels feedstock production.<sup>xlvi</sup>

The use of synthetic nitrogen fertilizers, a common practice in industrial agriculture, and one that can be expected to expand with the development of agrofuels, results in the emission of nitrous oxide (N<sub>2</sub>O)—a greenhouse gas 296 times more potent than CO<sub>2</sub>. A recent study by Nobel laureate Paul Crutzen states that “production of commonly used biofuels, such as biodiesel from rapeseed and bioethanol from corn, can contribute as much or more to global warming by N<sub>2</sub>O emissions than cooling by fossil fuel savings.”<sup>xlvii</sup> In the U.S., corn cultivation involves intensive application of nitrogen fertilizer, which contributes to the Midwestern agricultural runoff into the Mississippi River. This flows to the Gulf of Mexico where each year it creates an oxygen-depleted “dead zone” the size of New Jersey.<sup>xlviii</sup> When U.S. corn acreage reached a record high last summer, so did the size of the “dead” zone.<sup>xlix</sup>

Additionally, the extensive cultivation and processing of ethanol and other agrofuels will significantly deplete and pollute water resources in the U.S. and around the world. According to Colorado State University and UNESCO, it takes anywhere from 925 to 2700 gallons of water to produce the corn for just one gallon of ethanol.<sup>1</sup> To process a gallon of ethanol takes three to six more gallons of water, and can produce up to 13 gallons of waste water. Simply because they are “renewable” does not mean that industrially-produced agrofuels are sustainable. The greenwashing of agrofuels hides their real environmental costs to farmers, consumers and the environment.

#### *Big Biotechnology: The biggest Agrofuel Polluter*

The agrofuels boom offers biotech companies, including Monsanto and Syngenta, the opportunity to irreversibly convert all agriculture to genetically engineered crops worldwide. Presently 52% of corn, 89% of soy and 50% of canola in the U.S. is genetically modified (GM). Like a Trojan horse, the expansion of GM corn and soy for special ethanol processing plants will remove geographical barriers to the contamination of all non-GMO crops.<sup>li</sup> In the EU, consumer resistance has, to a large extent, kept GM crops out. Yet with agrofuels, the biotech industry has a chance to gain access through the back door by presenting GM crops as energy crops, not food crops.<sup>lii</sup> Once in the field, GM fuel crops can pollute non-GM crops indiscriminately, forcing acceptance of GE seeds upon farmers and GE foods on consumers. According to Bill Niebur, Vice President for genetics research and development at DuPont, “Demand for ethanol means that the race is on to rapidly ramp up grain yields.”<sup>liii</sup> In the seed and chemical industry, “ramping up” means “spreading out” of GE crops.

#### **Seed Monopolies**

Seed giant Monsanto alone accounts for 20% of the world's commercial seed market, 25% of the commercial market for soybean seeds, and 41% of the corn seed market.<sup>1</sup> In Brazil, Monsanto controls 30% of the corn seed market and over 50% of the soybean seed market; the company expects to control 90% of the market by the end of the decade.<sup>2</sup> The top three seed companies—Monsanto, Dupont and Syngenta—already control 44% of the global commercial seed market.<sup>3</sup>

### *Second Generation to the Rescue?*

The industry and political discourse on the U.S. Energy Bill has rested on claims that second generation agrofuels—such as cellulosic agrofuels from native plants like switchgrass and fast-growing trees such as eucalyptus—can be developed that will solve the problems posed by current agrofuels technology. The aim is for Big Biotech to profit by modifying the physiology of native plants and trees through genetic engineering (GE).

Second generation agrofuels will not solve the ecological problems from the monocultures promoted by industrial agriculture, nor do they resolve the problem of resource competition between food and fuel. When and if fuel crops like switchgrass and eucalyptus trees become viable commodities, they will very likely migrate from hedgerows and woodlots into the crop field, where they will compete with food crops

#### **Certified Sustainable Agrofuels**

One alternative to ensure the environmental and social sustainability is “sustainable regulation.” Theoretically, these regulations certify that participating companies do not use slave labor, do not grow feedstock on land that has been cleared of rainforest, and that they use ecologically-sound production and processing practices.

Unfortunately, as pointed out in a recent OECD study, macro-level impacts such as the relocation of production to lands outside the scope of certification cannot be addressed through these schemes. Likewise, certification cannot deal with other macro-level impacts, like the competition with food production, and access to land, water and other natural resources vital for human life. Historically, certification schemes have failed to ensure Free Prior and Informed Consent of affected communities and indigenous peoples.

The development of agrofuels is proceeding faster than certification can be implemented. Many countries lack the regulatory capacity to ensure the implementation and monitoring of safeguards and accountability mechanisms. Further, certification on a country-by-country basis leads to market segmentation rather than a significant reduction of unsustainable practices and a uniform and globally enforceable certification scheme is not likely.<sup>1</sup>

Under the current agrofuels context, sustainable agrofuels will likely develop into a niche market for consumers of fair trade products. An agrofuels niche market will not ensure sufficient agribusiness compliance at the global scales needed to prevent global warming, the destruction of the planet’s forests and conservation lands, and food and water rights for local populations. Without changing the context, certified agrofuel plantations will be small, sustainable islands in a globally unsustainable sea. Or worse, specialty niches for an affluent, environmentally-conscious, but globally irrelevant percentage of the planet’s energy market.

for land, water and resources. Additionally, second generation agrofuels will not be commercially available for at least a decade (if ever), and they will require major breakthroughs in plant physiology—not simple refinements of existing technology. A recent study from Iowa State University indicates that under the RFS targets, the expansion of cellulosic feedstock for ethanol production will *worsen*, not lessen, the competition for land and resources between food and fuel, sending prices skyrocketing.<sup>liv</sup> Further, they determine that, “In order for switchgrass ethanol to be commercially viable, it must receive a differential subsidy *over* that awarded to corn-based ethanol (emphasis ours).” In other words, subsidies to second generation fuels must be even greater than those presently propping up corn ethanol (that the authors conclude would disappear without government subsidies).

In April 2007, the Brazilian corporation Aracruz Celulose S.A., the world's largest producer of bleached eucalyptus pulp, was given license to conduct experiments with GM eucalyptus. The expansion of non-GM eucalyptus plantations in the South already poses serious risks to water tables, biodiversity, and livelihoods for rural communities. Because of their potential for genetic contamination, the threats from future GM eucalyptus agrofuel plantations are doubly dangerous.

The promise of second generation agrofuels is frequently invoked when corn, sugar, and palm-based ethanol are criticized. In the quixotic search for the "silver bullet" that will solve the food and fuel problem by technical means, these promises minimize the difficulties in making second generation feedstocks commercially viable, and ignore the problems of corporate concentration in the agrofuels industry. Faith in science is not science. Second generation agrofuels are less of a "great green hope" than a corporate smokescreen.

### **Alternatives: Building the next food and energy context**

The fracturing of the agrofuels consensus will not necessarily portend the end of the industry, or even the boom, for that matter. When the industry's spectacular growth settles—pushing farmers' profits down and eliminating smaller corporate players from the market—big grain, big biotech and big oil will use agrofuels to maintain their grip on our economy. They are able to do so because they have created the technical, political and economic conditions for agrofuels: the food and energy context. As long as food production is technically and financially constructed to respond to the industry's commercial interest, and as long as the political will for legislation and regulation is determined by the same corporate interests, agrofuels, arguably one of the worst ideas in the history of the modern agri-foods complex, will continue to invade and transform our food and fuel systems.

In order to think about alternatives to agrofuels—biofuels, conservation, wind, or solar—and in order to advance truly sustainable agricultural development at home and abroad, we need to construct an alternative food and energy context. Without changing the context, we cannot hope to affect the tremendous power of the corporations controlling our food and fuel systems. Constructing a context for truly green and fair alternatives requires a food and energy systems approach that challenges the dominance of the industrial agri-foods complex. We must challenge the political-economic context as well as the technologies, debunk the assumptions as well as the claims, and propose new relationships between producers and consumers in our food and fuel systems. This is a big order. However, it can start simply, by removing the artificial market incentive that created the industry: the RFS targets.

#### *The U.S. Moratorium on Agrofuels—A Necessary First Step*

Unless the current U.S. political and economic context for the expansion of agrofuels changes significantly, there is little to stop ADM, Cargill, Monsanto, DuPont, Toyota, BP and the other agrofuels giants from transforming our food and fuel systems for their own corporate profit. We need time for an informed

public debate on agrofuels. As a society, we need to weigh the evidence to date, undertake further research, and build an alternative context that favors family farmers in the North and South, and local alternatives to monopolistic, transnational industrial models.

There are many good proposals for local “bioeconomies,” for an equitable, sustainable “Farm and Food Bill,” and for the conservation of land, water, environment, and energy. We will never know if they are feasible until we change the current context that not only puts these alternatives at an industrial disadvantage, but almost guarantees their failure.

The targets set in the Renewable Fuel Standards of the U.S. Energy Act are the keystone of the agrofuels boom because they frame the economic context by obliging us to consume agrofuels. Without the targets, neither agrofuels’ substantial subsidies nor their protective tariffs can sustain the boom. Remove the 36 billion gallon per year targets and the boom comes to a grinding halt. This is why concerned citizens in the United States are calling for a moratorium on agrofuels by suspension of agrofuel targets.

Along with a coalition of progressive environmental and social justice groups in the U.S., Food First recently launched a global call for a U.S. Moratorium (See: <http://ga3.org/campaign/agrofuelsmoratorium>).<sup>6</sup> The call for an agrofuels moratorium in Europe has forced European Commission officials to acknowledge the dangers of agrofuels expansion, leading to a re-evaluation of Europe’s own agrofuels mandates.<sup>lv</sup> These encouraging developments are the results of the mobilization of concerned citizens and civil society groups.

#### *Building Social Movements for Food & Fuel Sovereignty*

Because they undermine food systems, agrofuels are a threat to *food sovereignty*: the right of all people to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems. Food sovereignty is now joined by the concept of *fuel sovereignty*, a re-vindication of the right to sustainable fuel systems that do not put food systems, farmers, or consumers at risk. At the heart of these concepts is the belief that we need to *democratize* our food and fuel systems in order to ensure equity and sustainability.

The democratization of our food and fuel systems requires a social change in the way we manage food and fuel. These changes will require immediate legislation—a moratorium—in order to formulate the proper regulatory context for sustainable and equitable food and fuel systems. These changes depend on the degree of political will on the part of business, our legislators, and our communities. Political will results from social pressure emanating from social movements—movements for food and fuel sovereignty. These movements already exist, and are gaining force, locally, nationally and internationally.

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<sup>6</sup> Rainforest Action Network, Global Justice Ecology Project, Food First, Grassroots International, Family Farm Defenders, Student Trade Justice Campaign

This policy brief series on agrofuels aims to build informed citizen engagement to help strengthen these movements. If we can change our thinking, we change the context. When we change the context, we level the playing field, allowing effective alternatives for food and fuel sovereignty to emerge.

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