BIOFUELS BACKFIRE[1]

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If the new "Renewable Fuels Regulations" are implemented this year as planned, all of our fuel will soon contain a mandatory amount of biofuels. The period for the public to comment on the regulations ended in early June and despite serious questions about the real costs and impacts, which have gone unanswered, the regulations could be published this summer. For a brief time, biofuels were widely celebrated as a green solution in the fight against climate change, with governments throughout the world leaping to subsidize the new industry. However, as a result, world food prices rose dramatically and local and global land conflicts came into sharp view. Now it seems that the environmental and economic consequences of the rush to capitalize on a 'green' fuel could ultimately be the exact reverse of what was promised.

Our government promotes the production of fuel from biomass as a way to cut greenhouse gas emissions and reduce our reliance on fossil fuels. At the same time, biofuels are touted as a way to create new economic activity, including the creation of new or stronger domestic and international markets for farmers. Canada's Agriculture Minister Gerry Ritz summed up the promise of biofuels when the government introduced the initial "Renewable Fuels Bill" in late 2007, just before the UN Conference on Climate Change: "Our government understands the desire of Canadians to do their part to deal with climate change and we know increasing the renewable content in our fuel is going to put a real dent in greenhouse gas emissions. Renewable fuels also have the potential to create new markets and economic incentives for Canadian farmers – that is why we have made biofuels development such a high priority."

The Harper government positioned biofuels as a tool to help meet its commitment to reduce domestic greenhouse gas (GHG) emissions by 20 percent below the 2006 level, by 2020. The government described the "Renewable Fuels Bill" as "proof of the real action we are taking here at home to promote biofuels and Canada as a clean energy superpower." At that time, biofuels were the new "technological fix" to global warming, yet only months later, their real environmental impacts were hotly disputed around the world and they were widely recognized as being responsible for the global food crisis.

Biofuels for Canada Rushed Forward

The Renewable Fuels Bill (Bill C-33) amended the Canadian Environmental Protection Act and gave the federal government the mandate to develop and implement new regulations to require five percent average renewable content in gasoline by 2010 and two percent average renewable content in diesel and heating oil by 2012. The Bill was passed in June 2008 at the height of the global food crisis, thanks largely to the Canadian Renewable Fuels Association and its close ties with government, ties that were detailed in an article published in the *Globe and Mail* entitled *A Lobby Machine That Runs on Ethanol* (May 30, 2008).

At the time of the Senate hearings that would ultimately pass the Bill, biofuel was such a new

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concept and there was so much new and contradictory information that environmental and social justice groups were barely able to address the issue. Every week, new studies emerged about the environmental, social and economic impacts. In Canada, a lot of data was missing and many numbers were contradictory. The big question of how Canada related to the conflict globally remained unanswered.

The price of staple crops had risen dramatically: wheat prices rose by more than 100 percent, corn by 66 percent and the cost of rice doubled. Global grain stocks were at their lowest since records began in 1960. According to the World Bank, three quarters of the food price increase worldwide between 2002 and 2008 was due to agrofuels. This was partly because agrofuels production led to low grain stocks, large shifts in land use, speculative activity and export bans. In March of 2008, the Canadian Biotechnology Action Network joined with a number of other groups, including the National Farmers Union and international development groups, to present a six-city tour of speakers from Asia, Africa and Latin America on the impacts of biofuels on food, farming and human rights. The "Crops, Cars & Climate Crisis" tour may have been the first time that biofuels were debated in Canada, but the government's Renewable Fuels Bill was about to be passed nonetheless.

By the time the Senate approved Bill C-33, it was clear the implications of biofuels were little understood. In fact, the Senate attached "observations" to the Bill for this reason, suggesting "any new information that is available prior to regulations being proposed is taken into consideration before such regulations are promulgated." The "biofuels mandate" is key to the Harper government's climate change strategy even as the role of biofuels in cutting greenhouse gas emissions is widely contested. In addition, there are many questions about other environmental impacts. In early January of this year, Environment Canada announced it had commissioned a new study to come up with environmental benchmarks for biofuel production. "Experiences in the US and Brazil now suggest that existing biofuels production facilities are responsible for the generation of a range of new air and water-related problems as well as recent concerns over human health," the ministry reported. "Based on global production levels from the past three years alone, there is now evidence of implications to the environment from biofuels-based ethanol production facilities." (Canadian Press, *Ottawa Takes a Hard Look at Biofuels*, January 9, 2010).

Although the report was due on March 31, it has yet to be seen. Despite the missing study, the biofuels regulations are now heading for publication, unless the Minister of Environment decides otherwise. Environment Canada is not providing any information about the study, but suggests instead that inquiries should be made through Access to Information requests. Life-cycle analyses of biofuels produce varying results, some negative and others positive. An important study conducted by the Swiss Institute Empa analyzed more than four fuel types (bioethanol, biomethanol, biodiesel and biogas) utilizing over 30 feedstocks (Rainer Zah et al. *Empa, Life Cycle Assessment of Energy Products: Environmental Assessment of Biofuels, 2007*). Empa found that while some biofuels reduce GHGs, the trade-offs can be significant in terms of other ecological impacts. The study concluded that most of the negative impacts were due to the agricultural production of raw materials (feedstocks). Those fuels that had the worst ecological balance in comparison to fossil fuels were ethanol from corn, rye and potatoes and biodiesel from soy and canola. In Canada, corn (in the East) and wheat (in the West) are the primary feedstocks for ethanol production.

Agriculture is already responsible for approximately 14 percent of global greenhouse gas emissions. Growing corn on a large scale, for example, uses a lot of water, fertilizer – made from

fossil fuels and releasing the powerful greenhouse gas nitrous oxide – and pesticides. Two-thirds of the biofuels life-cycle studies reviewed by the United Nations Environmental Programme did not take into account the impacts of nutrients on the environment (increased eutrophication), acidification, toxicity of chemicals used to grow the crop, summer smog, ozone depletion and loss of biodiversity. (UNEP – *Towards Sustainable Production and Use of Resources: Assessing Biofuels, 2009*).

Despite various glamorous, high-tech promises for new "second generation" technologies and feedstocks, the reality is that for the next five to 10 years, biofuels will be produced from agricultural crops, including trees, produced in large scale, energy-intensive monocrops. This is why many communities refer to biofuels as "agrofuels."

Global Destruction

"This regulation makes no sense whatsoever," says Michael Casey, executive director of Development and Peace. "In fact, when one takes into account the deforestation and massive use of pesticides and fertilizers for growing the biomass needed for agrofuel production, the environmental benefits are zero." For example, expanding the production of palm oil (oil palm trees) and other agrofuel crops is also destroying forests around the world, forests that are needed to absorb carbon and to fight climate change as well as providing habitat for endangered species like the Orangutan.

This dynamic is relevant to consider in Canada where conversion of perennial groundcovers to more energy intensive annual cropping systems will increase GHG emissions and convert the Canadian prairie from its current status as a carbon sink to a net emitter of greenhouse gases (80 percent of Canada's productive agricultural land is located in the prairies).

To overcome these obstacles, incredible financial and intellectual resources are being devoted to developing new or improved feedstock, such as trees genetically engineered to have low lignin and better enzymes (created through synthetic biology) for processing. These technologies bring their own environmental safety threats and by the time we see any of these second-generation biofuels, the first generation will have done lasting global damage.

The potential consequences of biofuels for our environment and economy are unclear, but unless the Minister of the Environment decides otherwise, unfortunately, we may all too soon be realizing the exact impacts through direct experience.