

## “Energy in the Americas”

Testimony by

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Most Americans are unaware that the Western Hemisphere supplies the bulk of U.S. energy needs. According to the Energy Information Administration, the US imported 28.3 per cent of its oil from Latin America and the Caribbean in 2007, far surpassing the 16.6 per cent imported from the Middle East. Latin America is poised to increase its importance as a supplier of fossil fuels to the U.S, thanks to the recent discovery of potentially 40- 50 billion barrels of oil and natural gas in Brazil. In addition to the world’s third-largest proven oil reserves, Latin America has significant natural gas reserves (mostly unexplored), abundant hydro-electric power potential, and a substantial capacity for other alternatives such as biomass energy (40 percent of the world’s biodiversity is in this hemisphere), geothermic, aeolic and solar power.

Renewable energy development in the Americas offers the region an important opportunity for the development of clean energy sources at a time of increased concern about climate change. But renewable energy development also affords small island states so close to our third border with a source of power that can relieve the dependence on fossil fuels at a time when high petroleum costs are bankrupting governments and throwing more of the region’s population into poverty. Low-income oil-importing countries have seen their fuel bills increase by US\$40 billion over the last year as a result of the doubling of crude prices. In the first quarter of 2008, Costa Rica and Guatemala spent close to one billion dollars each, an amount 88 per cent and 63 per cent higher than for the same quarter of 2007, respectively<sup>1</sup>.

Today I want to focus on energy cooperation and on biofuels, in the Hemisphere.

Even in oil-poor countries in the Caribbean and Central America who have signed on to Venezuela’s Petrocaribe oil diplomacy the long-term outlook for sustaining such support is not promising. Alternatives to fossil fuel and policies

that promote effective use of wind, solar and biomass energy are in the long-run what must be developed to ensure reliable energy in the region.

The good news is that Latin America is emerging as a key global producer of biofuels as nations across the region use their competitive advantages such as fertile land and tropical weather. The region invested more than US\$8 billion in biodiesel and ethanol in 2007 and has already launched new projects set to increase global biofuels production as demand for hydrocarbons from emerging-market economies outstrips production<sup>2</sup>.

### **The Case of Brazil:**

Brazil, whose ethanol industry started thirty years ago, has greatly helped alleviate its dependence on fossil fuels for transport. In 2007 12% of all transport fuels were sugar-based<sup>3</sup>. This shift away from hydrocarbons has been favored by an extensive distribution infrastructure and the use of advanced flex-fuel engines in Brazil that allow the consumer to switch between gasoline and ethanol, or a combination of the two.

Brazil is the world's leading producer and exporter of bioethanol with ethanol mills expected to produce up to 27.5 billion liters in the 2008/09 season, up from 23 billion liters in 2007/08<sup>4</sup>. It is also the most efficient, using hybrid sugar cane that yields high energy ethanol, but also uses the waste or bagasse to generate electricity that runs the production facilities and supplies the communities where the ethanol is produced.

According to the World Bank's *Biofuels: the Promises and the Risks*, the U.S. ethanol industry currently uses 10 million hectares, while Brazil only uses 3.6 million of such terrain and produces eight to ten times more energy than that produced from corn. Brazilian-produced ethanol, generated from sugarcane, emits between 80%-90% less carbon than gasoline, while U.S. corn-based ethanol reduces greenhouse gas emissions by only 10%-30%<sup>5</sup>.

As long as oil prices remain over \$40 dollars a barrel Brazil's ethanol will remain competitive. This is comparatively lower than bioethanol made from corn in the United States which costs \$65 per barrel.<sup>6</sup>

In March 2007 the U.S. and Brazil signed a memorandum of understanding to jointly develop biofuels in the hemisphere. The agreement launched a series of technical missions with experts from Brazil and the U.S. for a targeted approach

to biofuels development directed at countries in oil-poor states such as the Dominican Republic, El Salvador, Haiti, and St. Kitts and Nevis (There were the first beneficiaries of joint support.). Both countries used this collaboration to help promote the use of ethanol as an alternative renewable energy resource, with specific programs of action that would help advance a broader regional biofuels market. To date this effort has yielded important results starting with greater cooperation between the U.S. and Brazil around hemispheric energy needs. It also helped solidify a regional strategic relationship between the two largest nations of the hemisphere. While it is too early to determine the ultimate outcome of the agreement, there is a consensus among experts in the field and among regional governments that this approach of both nations should endure beyond the current administration, and should become a foundation for energy security relationships in the Americas.

What has not been resolved, however, is the continued U.S. policy of imposing a 2.5 percent duty, plus 54 cents per gallon on Brazilian ethanol imported into America. While much Brazilian ethanol enters the U.S. through the Caribbean under the terms of the Caribbean Basin Initiative (CBI) and the Central American Free Trade Agreement (CAFTA) that includes the Dominican Republic, given the requirements of the 2005 Energy Policy Act and the Energy Independence & Security Act of 2007 which requires the use of 36 billion gallons of ethanol in the U.S. by 2022, it is folly to continue this tariff in light of the escalating fossil fuel prices.

The significant public criticism that is being generated by the use of a food crop – corn - for production of fuel, combined with the devastating impact of the recent flooding in central U.S. corn-growing states, has led 51 House Republicans to ask the Environmental Protection Agency to reduce this year's ethanol production requirements, in late June 2008. The House initiative was soon followed by a letter to EPA Administrator Stephen Johnson from 24 senators, urging the EPA to reset ethanol targets. The EPA is expected to announce a decision in August 2008. Instead of revising the standards, the U.S. should revisit the tariff it is imposing on ethanol imports from Brazil and support second-generation biofuels. These fuels are made from biomass like straw, agricultural by-products and forestry wastes<sup>7</sup>.

Brazil's success story has generated considerable interest in biofuels across Latin America, but no other industry in the region has yet approached the size or sophistication of Brazil's. Brazil is now actively conducting ethanol diplomacy with neighbor countries, signing technology exchange agreements with Peru,

Colombia, Argentina, Venezuela, Panama and Cuba. Benefiting from fast improving relations, President Lula da Silva signed in mid-January 2008 several agreements with President Raul Castro to bolster economic ties, focusing in several areas, including the sugar industry<sup>8</sup>. In exchange for know-how, the Brazilians are obtaining a significant strategic advantage in the development of a sugar-based biofuels industry on the doorstep of the U.S. Agricultural experts have estimated that Cuba could eventually provide more than 3 billion gallons of sugar-based ethanol annually; perhaps even more when new technologies for extracting energy from sugar cane waste come online - placing the island third in world ethanol production, behind the U.S. and Brazil. Given the relatively small demand for auto fuel in Cuba, nearly all of that ethanol would be available for export<sup>9</sup>.

Many countries in Latin America have ample farmland available for cultivation of energy crops. The Caribbean and Central America, but especially the Dominican Republic, Cuba, Guatemala, Costa Rica, and El Salvador, which once relied on sugar exports to support their economies, are now ripe for conversion of that commodity to ethanol. Given the absence of fossil fuels in this part of the hemisphere the advent of biofuels offers these countries a much needed alternative source of fuel for domestic consumption and, in some cases, a source of export revenues. Under the Caribbean Basin Initiative (CBI), countries in Central America and the Caribbean have had duty-free access to the United States since 1989 for ethanol produced from regional feedstock. Access for ethanol derived from non-regional feedstock has been limited by a CBI quota equal to 7 percent of total U.S. ethanol consumption. Above that 7 percent quota, another 35 million gallons of Caribbean ethanol can come into the U.S. duty-free *if* it has 30 percent local sugarcane content. Beyond the additional 35 million gallons, it is duty-free only with 50 percent local feedstock.

Costa Rica, El Salvador, Jamaica, and Trinidad & Tobago are the only countries that have ever exported ethanol under the CBI quota. In 2007 they exported 230 million gallons of ethanol to the US, which was about half of all ethanol imports in that year<sup>10</sup>. A large share of this ethanol was Brazilian ethanol that was merely reprocessed, or dehydrated to remove excess water in the Caribbean. Cargill and Brazilian partners are reportedly investing in ethanol processing plants in Jamaica, building the world's first dedicated ethanol shipping terminal at the Brazilian port of Santos, and buying Brazilian sugar mills and ethanol plants. In 2006, word got out that Cargill planned to build an ethanol dehydration plant in El Salvador to process Brazilian ethanol for duty-free import into the U.S. under the CBI preference.

The current ethanol production capacity in Central America and the Caribbean is limited by lack of government support, poor infrastructure, and absence of or a weak regulatory framework. The U.S.-Brazil Biofuels Agreement was also targeted at supporting those Central American and Caribbean states that would benefit from assistance on legal-regulatory frameworks that Brazil had developed in its biofuels industry. This support, however, is still new and will take more time to develop. In addition, sugar lobbies in El Salvador and the Dominican Republic, who still receive subsidized sugar prices on their crop from the U.S. sugar quotas, are still reluctant to transform their sugar industries into biofuels operations until that benefit ends. There is also the uncertainty of the relationship of oil prices to ethanol development, though it is highly unlikely that we will ever see cheap oil again.

Were the current duty on Brazilian ethanol imports to be eliminated, reprocessing Brazilian ethanol in CBI countries would lose its appeal. The CBI countries that have been investing in reprocessing facilities would then have to shift their focus to developing their own ethanol industry, to cover Caribbean needs and exporting to the U.S., possibly resorting to Brazilian expertise but also to U.S. and Indian technology. As technology for second generation biofuels like cellulosic ethanol becomes available, CBI countries can move beyond sugar-based ethanol in the mid- to long-term and use their vast biomass, which can be converted into cellulosic ethanol to alleviate their significant fossil fuel dependency. Although the region's production capacity would never be able to reach Brazil's – due to land and weather constraints -, shipping costs for ethanol produced by CBI countries would still be cheaper than for Brazilian ethanol. That plus the fact that at least half of the CBI ethanol quota typically goes unused bodes well for the expansion of ethanol production in CBI countries.

### **Energy for Development:**

Development of biofuels also offers an important social dimension. It is a source of increased jobs not only in the agricultural sector, but also in the other industries that have grown up around the emergence of bioenergy production. In a region where the gap between rich and poor is most pronounced (35 percent of the region still lives in poverty, in spite of improved growth rates) renewable energy development offers an industry that will positively impact the region's most vulnerable populations. It is appropriate technology that can be used for large-scale production, but also lends itself to small farmer solutions as well. There is also growing evidence that rural development could be sustained by the

creation of segmented biofuels markets to provide communities with fuel for cooking, transport and electricity generation, especially since a significant percentage of Latin Americans do not have access to electricity, particularly in rural areas. In Nicaragua, for example, less than half of the population has access to electricity<sup>11</sup>.

In some poor countries like Haiti, it is clear that using refined biomass sources that are renewable and sustainable to produce energy may well offer an exit from the dependence on oil imports for transportation and on wood for cooking. Haiti not only imports all its oil but an estimated 8200 tons of wood is harvested annually for fuelwood, while approximately 700 tons of wood is being converted to charcoal. The environmental consequences of this practice have become apparent in recent years, where deforestation has led to devastating soil erosion and severe flooding. The smoke from thousands of charcoal fires has led to widespread respiratory infections and the aquatic life in the oceans surrounding Haiti has been degrading<sup>12</sup>. In Haiti's case there is not enough land for ethanol but reprocessing is a possibility. The use of a non-food crop, *Jatropha*, which can be made into biodiesel, promises a new beginning for Haitian rural farmers.

*Jatropha*, which is an indigenous crop in the Caribbean and Central America, also offers the most promise as a non-food feedstock for biodiesel in Mexico, Brazil, Colombia and the Caribbean. *Jatropha* is a valuable multi-purpose crop to alleviate soil degradation, desertification and deforestation, which can be used for bio-energy to replace diesel and jet fuel, for soap production and climatic protection. The shrub compares favorably with other plant sources because the seed cake is an excellent fertilizer, the seeds are inexpensive and have high oil content, the shrub can grow on both good and degraded soil and in low and high rainfall areas, without large quantities of fertilizers. Finally, *Jatropha* oil was estimated \$43 per barrel in 2007, which is much lower than the current price of diesel.

*Jatropha* can help to increase rural incomes, self-sustainability and alleviate poverty for small farmers by providing them with an additional source of income. In remote areas of Latin America, where electricity is always in short supply and fossil fuels are not readily available, *Jatropha* oil can power generators, lights and farm equipment as well as cars. Pure *Jatropha* oil can even be used directly in the electrical generators used to power telecommunications towers in rural areas. This gives incentives to rural communities to grow oil seed crops and process them locally since cellphone providers who run the towers are a ready market for this oil. Such a win-win

situation for both local farmers and cellphone providers offers great new opportunities to create new markets with sustainable local production of oil and increase access to information in remote communities.

In addition to Jatropha, biodiesel can be made from soybeans, African palm, coconut, castor, other oil seeds and also from animal fat. Brazil, Argentina, Paraguay, Colombia and Guatemala have been the main centers of biodiesel production. But other countries in Central America and the Caribbean are also picking up production, though the volumes are quite small.

Brazil has enacted laws that require mandatory percentages of biodiesel in its diesel supply and the "Selo Combustivel Social", a stamp that is provided to biofuel producers when they purchase feedstock from 'certified' small farmers. When over 50% of the feedstock has the stamp, biodiesel producers receive a significant reduction in their taxes. Brazil's main source of biodiesel is soybeans but since the beginning of 2008, Petrobras and other biodiesel producers have been looking for alternatives, following the significant increase in the price of soybeans and the food for energy debate.

Colombia, Latin America's second-largest biofuels producer, is increasing output through new investment in sugar production and palm oil, which can also be turned into fuel. Colombian officials say abundant grasslands are ideal for biofuels development since crops can be grown without cutting down rainforests. Colombia expects to produce 1 billion liters of ethanol per year by 2010, more than doubling current output, and plans to have enough production by the end of the year for export. In 2007 there were 300,000 hectares planted with African palm trees and the country's goal is to reach a million hectares within the next few years. In addition, seven palm processing plants were under construction in 2007 in different sections of the country, at a cost of approximately US\$100 million. African palm has been recently criticized because the crop consumes great amounts of water. Furthermore, reports have been surfacing linking growing demand for the crop to forced evictions, intimidation and even murders in Colombia. This has increased pressure on retailers, food companies and biofuel producers to ensure that the palm oil they buy comes from legal and sustainable sources.

In March 2006, El Salvador opened Central America's first biodiesel plant with financial support from Finland to produce 400 liters a day. The project, still in its early development phase, is part of a public-private partnership between Finland's Environment and Foreign Affairs Ministries and 34 Central American

companies and institutions to cultivate renewable energies and combat climate change. They are feeding the plant with seeds from the Higuierillo (castor) tree and the fruits of the *Jatropha* bush, both native plants. El Salvador's potential is significant because it has a favorable climate, good quality land, and six months of rain a year. In addition, only 70 percent of the country's arable land is currently in use<sup>13</sup>.

Guatemala is seen as one of the emerging model for sustainable biofuels development for the region and for the world. In addition to four ethanol plants that are already in production, using the country's mature and sophisticated sugar industry for feedstock, the country has been investing in biodiesel production. Guatemala has more than 1 million acres available for the planting of *Jatropha* developed by Octagon and 47,000 hectares of palm planted, with a potential yield of 187,000 metric tons of oil. The country's first biodiesel plant is expected to open later in 2008. Operated by Palmas del Ixcán, a Guatemalan company, the venture is beginning with 10,000 hectares of palm oil, with plans for 100,000 hectares under cultivation by 2017. Most of this production is expected to be used domestically, as a substitute for the more than 600 million gallons of diesel consumed annually in Guatemala.

### **Opportunities looking forward:**

Looking forward, the Kyoto Protocol has provided an additional impetus to biofuels development as industrialized countries seek to meet their emissions reduction targets. The advantages offered by biofuels, such as lower carbon emissions and competitive production techniques, rely on existing technology. Latin America is second only to Asia as a location for Clean Development Mechanisms (CDM) projects, with 47% of the projects in 2006. There is interest in investing in these types of projects in the region, and there are parties already experienced in the CDM process.

Colombia and Peru, which have negotiated free trade agreements with the United States, (though Colombia's is still pending Congressional approval), have a potential advantage because of that access to the US market. Indeed, Colombia is planning a major expansion of its palm oil production as a biodiesel feedstock, with an eye to the export market. Similarly, Mexico, with its proximity to the United States and open access to the US market under the North America Free Trade Agreement (NAFTA), has strong external incentives to produce biofuels,

including reducing air pollution, promoting rural development, and potentially supplementing its declining oil reserves through biofuels production and use.

## **Conclusions:**

### **Biofuels are an important complement to the energy matrix of the hemisphere**

Latin America's potential to produce all forms of energy – from fossil fuels, to biofuels to other renewable resources is very promising. With rising oil prices, and a long experience in the production of ethanol from sugar cane in Brazil, biofuels are becoming a major and growing component of the regional energy matrix. Their importance will grow with the development of second generation biofuels (cellulosic). Biodiesel production will also increase as the expansion of non-food based feedstock such as Jatropha and Castor create a steady supply of this fuel.

### **The biofuel potential of the Caribbean and Central America is a window that gives oil-poor countries a choice.**

In countries whose agriculture was based on sugar-cane cultivation the advent of sugar-based ethanol has given the oil-poor nations of the Caribbean and Central America a new economic opportunity to produce fuel for transport from a crop well-adapted to the region. What is needed, however, are the appropriate legal-regulatory frameworks that will encourage the transition from fossil fuel vehicles to flex-fuel vehicles. Legal regulatory reforms will also be needed to create incentives for producers to develop this important industry. The benefits, however, will provide important relief to the economies of countries now suffering from the economic strains that the high price of fossil fuels are causing to regional budget priorities.

### **In the immediate future, PetroCaribe has become the solution. It is NOT sustainable. Biofuels in oil-poor states is a better long-term solution.**

Sixteen countries in the Caribbean and Central America are now beneficiaries of Petrocaribe, the highly subsidized oil program that Venezuelan President Hugo Chavez has used to leverage influence in the region. At the most recent meeting of Petrocaribe in Caracas earlier this month recipient nations welcomed the continued support and discounts on oil. But in the long-run getting oil from Venezuela to off-set price hikes is not a sustainable solution to the energy needs of the Caribbean and Central America. The U.S. should

continue to support and increase assistance to ensure that alternative energy sources are developed, both in biofuels and other forms of renewable energy, that give these small island states and other oil-poor countries a chance to maintain energy supplies without a dependence on Venezuela.

### **Haiti and the Dominican Republic: An Opportunity**

The island of Hispaniola where two nations co-exist is ripe for an intense effort to develop sustainable renewable energy programs. On the Haitian side the potential for biodiesel production based on cultivation of *Jatropha*, and ethanol from sweet sorghum can provide some immediate relief in isolated villages that require energy for lighting, cell phone towers and for transport. Haiti's grid does not extend outside the key cities. Creating renewable energy farms from crops that are local, and do not compete with food supply could generate employment, provide energy, and save the remaining soil from further erosion. The U.S. Biofuels Agreement has started to look at these issues, but additional cooperation from the private sector and from a wide range of donors is needed to ensure that Haiti has a reliable source of diesel fuel.

The Dominican Republic, a country whose growth rate continues to climb, is also in dire need of reliable energy supplies. Most electricity today is produced from imported diesel fuel. A strong biodiesel industry could offset the demand for fossil fuels and also run the electric system with a form of clean and sustainable energy. Sugar cane cultivation, which is an important industry in the country, should also be converted to the production of ethanol for domestic use and for export. The recent passage of a new alternative energy law could help advance this effort. However, the country also receives subsidies for sugar and U.S. sugar quotas make export of sugar cane a more lucrative operation than conversion to biofuels. An incentive program to change the dynamic of sugar imports to the U.S. could encourage a more aggressive approach to renewable energy development. The benefits in jobs created and employment generated for both small states is also another advantage that could help the development of these countries.

## **Brazil and the US are biofuel giants: The benefits of cooperation outweigh the energy relationship itself.**

Advancing the relationship between the U.S. and Brazil on biofuels is important not only for the technical advantages that each country brings to the region, but also for important geopolitical reasons. Brazil is South America's most populous and economically powerful state. With the U.S. it can certainly develop enduring types of positive assistance to other nations who require energy, and also want to reform their energy matrix toward more sustainable sources. Congress should work with U.S. government agencies – the Department of State, Department of Energy and U.S. AID to create a single home for biofuels development that can be applied to the socio-economic need of the region. Cooperation with the OAS and the UN around renewable energy diplomacy can also advance the underlying principles of the agreement – support for sustainable renewable energy sources to the poorest countries of the region, and technical assistance to those countries with the capacity to convert their sugar industries to export oriented fuel suppliers.

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<sup>1</sup> Humberto Marquez, "Oil-Caribbean: PetroCaribe Building 'Anti-Crisis, Anti-Hunger Shield'", *Inter Press Services News Agency*, July 16<sup>th</sup> 2008.

<sup>2</sup> "ANALYSIS-Politics aside, Latin America biofuels loom large", *Reuters*, July 21<sup>st</sup> 2008.

<sup>3</sup> "Balanço Energético Nacional – Resultados Preliminares, ano base 2007", *Empresa de Pesquisa Energética*, 2008.

<sup>4</sup> "ANALYSIS-Politics aside, Latin America biofuels loom large", *Reuters*, July 21<sup>st</sup> 2008.

<sup>5</sup> "Biofuels: The Promise and the Risks", *Agriculture for Development Policy Brief*, World Bank, 2008.

<sup>6</sup> While Brazil does not subsidize sugar, which helps sustain global sugar prices, the corn-ethanol sector in the US receives a total of some \$6 billion in support each year. This heavy subsidization combined with the fact that a quarter of U.S. corn production is being used to produce ethanol, has generated criticism in view of the recent food price hike, as many believe that biofuel production can explain up to one third of the price increase. Sugar, however, is not really a food crop; it is more a food additive and its expansion has not displaced the production of other food crops in Brazil. Stephanie Holmes, "Bioenergy;Fuelling the food crisis?", *BBC News*, June 4<sup>th</sup> 2008.

<sup>7</sup> Suzanne Hunt, "Biofuels, Neither Savior nor Scam – The Case for a Selective Strategy", *World Policy Journal*, Spring 2008, pp. 9-17.

<sup>8</sup> "Brazil's Lula offers Cuba oil knowhow, credit", *Reuters*, January 15<sup>th</sup> 2008.

<sup>9</sup> Chuck Squatriglia, "With Fidel Gone, Will Cuba Become a Global Ethanol Player?", *Wired.com*, February 19<sup>th</sup> 2008.

<sup>10</sup> "U.S. fuel ethanol imports by country (millions of gallons)", *International Trade Commission*, 2008.

<sup>11</sup> Sarah Wilson, "More heat than light", *The Guardian*, October 28<sup>th</sup> 2007..

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<sup>12</sup> Kara Newman, "A greener charcoal - How a team of MIT students will help (profitably) solve Haiti's cooking-fuel crisis", *Fortune*, November 28<sup>th</sup> 2007. Gerthy Lahens, "Fuel From the Fields: An alternative energy to reduce deforestation in Haiti", *World Bank 2007 first prize winner*, 2007.

<sup>13</sup> Eliza Barclay, "Stuck in the Middle with Fuel - As its neighbors back biofuels, Central America gears up for business", *GRIST*, December 14<sup>th</sup> 2006.