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Ethanol diplomacy: Brazil and U.S. in search of renewable energy

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The objective of this study is to broaden the discussion regarding renewable energies to better understand relations between the United States and Brazil. The administrations of those nations, as well as certain companies from each country, have already begun the search for creative solutions for what is considered today the biggest problem facing our planet: the imminent lack of energy once oil runs out.

Key words: International Relations, Energy, Ethanol, United States, Brazil.

1. Introduction

It is not possible to understand the behavior of the production and world consumption of ethanol without establishing a correlation with the production and consumption of petroleum. In addition to having the same function, these two fuels can be used as strategic complements. In other words, together they can be used to respond to and satisfy the same demand, with one significant difference; the use of ethanol, alone or together with petroleum, helps reduce pollution levels and, consequently, global warming. The relations between Brazil and the U.S. in the near future will be established by three factors: First, Brazil, having recently discovered oil in pre-salt reserves and having taken a position of world leadership with respect to the production of renewable energies, will transform into an important energy supplier to the U.S. Second, Brazil sided with the U.S. during WWII, Cold War and throughout the last century has been allied with the U.S. in almost all of its initiatives. Third, Brazil is a stable democracy and maintains an important dialogue with the other countries of South America, where it fosters peaceful leadership without any hegemonic pretensions.

Brazilian and U.S. relations, throughout history, have always been positive. During the Brazilian monarchic period (1822-1889), even though the United States was then a model republic, there were common interests and agreements between the countries. Brazil's political regime was flexible and tolerant and, like the U.S., also disagreed with the major European powers' foreign policies. Looking

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through diplomatic documents of that era, one can see a certain respect between the U.S. and Brazil in relation to regional hegemony; Brazil would not interfere in issues involving the U.S. and other countries of North America and the Caribbean, and the United States would not interfere in Brazil's issues with other South American countries. At the beginning of the twentieth century, complaints surfaced concerning Brazilian "hands off" diplomatic reactions to attempts at intervention by the U.S. on issues involving Bolivia, Peru, Chile and Ecuador. Friendly relations with the U.S. were also important when Brazil faced internal difficulties as it rallied against international communism, launching a military regime that lasted for 21 years (1964-1985) in Cold War era.

While the oil crises of the 1970s, which stemmed from political and military issues, originated in retaliations by Arab countries against U.S. support of Israel during the Yom Kippur War (1973), the current oil crisis has its roots in a huge increase in demand by a world ever more consumerist. Other reasons can be identified in, for example, the tensions around Iran's nuclear program, ethical conflicts in Nigeria, and the new prominence of Russia as a military power.

The strategic importance of access to sources of energy is a crucial consideration for any nation and defines its survival. To the U.S. government, it has been clear since the Soviet Union's invasion of Afghanistan (1979-1989) that energy-related issues are closely linked to geostrategy and national interests. In 1980, President Carter expressed what has since been called 'The Carter Doctrine', saying, "An attempt by any outside force to gain control of the Persian Gulf region will be regarded as an assault on the vital interests of the United States of America, and will be repelled by any means necessary, including military force." The vital interests to be protected were Middle East oil and its "free movement".²

Versions of Carter's doctrine have been invoked in several other recent moments in American history: the Kuwait intervention, the recent Gulf wars, the military operations in the Caspian Sea, the Clinton government's Operation CENTRAZBAT 97 and even the recreation of the Fourth Fleet, in 2008, to patrol the South Atlantic. Regarding U.S. military operations in the Caspian Sea, where large reserves of oil were believed to exist, President Clinton affirmed, "our nation cannot afford to rely on any single region for our energy supplies, we not only help Azerbaijan to prosper, we also help diversify our energy supply and strengthen our nation's security."³

2. The world's consumption and production of energy

The world's energy consumption will increase by 50% in the 25 years between 2005 and 2030, according to a study from the U.S. Department of Energy's Energy Information Administration (EIA). Energy consumption will shift from 462 to 695 quadrillion British Thermal Units (BTUs). This consumption will increase in different proportions across the globe; OECD (the Organization for Economic Co-operation and Development) countries will increase their consumption by 19% while non-

² <http://www.jimmycarterlibrary.org/documents>

³ <http://www.whitehouse.gov/about/presidents/williamjclinton/>

OECD countries will increase by 85%. This shift in energy behavior is connected to the steady growth of the economies of these countries. The annual average growth in OECD countries in this period will be 2.3 % while the growth of non-OECD countries will be more than double that at 5.2 %.⁴

Liquid fuels will grow in use from 170 to 230 quadrillion BTUs (35%); coal will increase from 120 to 200, representing the highest growth in absolute numbers (66%); natural gas from 100 to 150 (50%); renewable fuels from 25 to 50 (100%); and nuclear energy sources from 25 to 30 quadrillion BTUs(20%). Global warming will rise with the greater increase in the use of coal than in previous years. To focus on one resource – coal – the U.S. is one of the largest coal consumers; almost 55% of its energy matrix is based on coal. Despite this, together the U.S. and India, two of the largest consumers, will be responsible for less than 10% of the world's coal production. China alone will consume, by 2030, 71% of the world's coal as their energy source. This data comes from the 2008 EIA report.

Coal, natural gas and oil are non-renewable resources. In the future, the nature of the market for renewable resources will be even more dependent on the nature of what is non-renewable. For instance, the production of renewable energy will be strongly influenced by the price of oil in the world market. According to EIA projections, two scenarios should be considered: the first one is that by 2030 a barrel of oil will cost \$110; in the second scenario, the price will be \$180. Therefore, cheap oil will be hard to find in 2030. The following factors will be primarily responsible for the increase of prices: increase in demand, mainly in the emerging non-OECD countries; increase in operating costs due to a depletion of easily accessible oil; the absence of new discoveries of oil reserves, especially among the OPEC countries; and finally, the devaluation of the U.S. dollar.

The increase in worldwide demand for oil has been accompanied by reductions in formerly traditional regions of production. Production has decreased in England by 7.7% per year, in Norway by 5.9% and in the U.S. by 1.8%. Meanwhile, expectations for increased production and supply are focused on new areas such as the Caspian Sea and the West African Coast, as well as on the traditionally productive regions devastated by recent conflicts in Iraq and elsewhere. With respect to such conflicts, the possibility of reducing disputes involving oil-producing areas could be an alternative to increased production elsewhere, although there is no indication that an end to these conflicts could come soon. The conflicts in the Middle East are increasingly complicated and have not shown any signs of ceasing. Countries like Venezuela, Iraq, Russia, Nigeria and Georgia are examples of nations whose production has been interrupted by conflict.

Due to high petroleum prices, other types of liquid fuel will gain markets previously occupied by oil. Biofuels will be increasingly more important sources of energy in the economy heading toward 2030, largely due to a growth in U.S. production, estimated at upwards of 1.2 million barrels per day, which will represent almost half the production of biofuels in the world. Currently the usage of fuels such as biodiesel and ethanol in the total consumption of liquid fuels is 9%. In 2030 it will be 20%. Countries with favorable climates and the availability of cheap and arable land will be viewed as

⁴ <http://www.eia.doe.gov/oiaf/aeo/>

providing economic alternatives to the production of renewable energy and, therefore, providing viable, renewable alternatives to non-renewable sources.

One cause of the increased demand for liquid fuels is that the use of liquid fuels around the world with respect to transportation, in comparison with other uses, is increasing. The other uses include electricity generation, power supply to residential buildings and industrial usage. Transportation currently accounts for 52% of liquid fuel consumption; this will increase to 58% of the total by 2030. Associated with the use of liquid fuels is the emission of pollutants. For example, in 2005, CO₂ emissions from hydrocarbon consumption were measured at 28 billion tons. In 2030, they are estimated to rise to 42 billion tons. OECD countries will practically not alter their emissions, since the transportation infrastructure of these countries is already established and the number of vehicles will not have increased as much as in emerging countries. The greatest factor in the increase of emissions is that emerging countries which continue to grow with high GDP rates will be users of coal.⁵

3. Consumption of oil and U.S. dependency

In 2000, the United States consumed approximately 20 million barrels of oil per day and produced approximately 8 million per day. The projection of the U.S. National Energy Policy for 2020 (published in 2001) is that production will be 6.5 million barrels with consumption at 27 million barrels per day. Oil production in the United States has been decreasing in an accelerated way since 1986, and the current stocks of U.S. oil are the lowest they have been in 30 years; yet the country's dependence on imported oil increases every year. Dependence on imports was 35% in 1973, 55% in 2001 and is projected to be 76% by 2020. As well, the country's capacity to face an interruption in imports has grown smaller, especially when compared to that capacity during the oil crises of the 1970s. The five largest foreign suppliers of oil for the U.S. represented 53% of its production capacity in the 1970s; now they represent 77%. Adding to the predicament, most of those suppliers are included in a group of countries that President Obama has termed "hostile governments".⁶

President Obama has asserted that the U.S. will not be held hostage to such hostile governments, nor to depleted resources nor to global warming. The core of his plan is to reduce U.S. dependency on oil internally as well as externally by creating alternative sources beginning with the development of new technologies. The plan foresees that, from 2011 on, the industrial production of automobiles will give families more energy efficient cars that in turn will reduce oil consumption. Additionally, these new vehicles will reduce CO₂ emissions, further benefiting the planet. Such a plan, and similar plans by other nations, would, if implemented, alter the projections of the National Energy Plan for 2020.

4. Ethanol production data

⁵ <http://www.eia.doe.gov/oiaf/aeo/>

⁶ <http://my.barackobama.com/page/community/tag/Foreign+Policy>

When large-scale ethanol production began in Brazil in 1980, a barrel of ethanol cost around \$100. The Brazilian government decided both to facilitate consumption and to subsidize this production. However, over time, the government reduced the subsidy so that currently there is no government subsidy of ethanol production in the country. The increase in production in the initial phase (from 1980 on) did not generate economies of scale due to that fact that production itself needed and consumed oil. Recently though, the costs of ethanol have dropped thanks to good agricultural practices, better management of agribusiness enterprises, better soil preparation, new variations on use of sugar cane and alternative energy use of *bagasse* (processed sugar cane residue). With these new conditions, the price of an ethanol barrel lowered; in 1985, a barrel cost \$90; in 1990, \$48; in 2000, \$36; in 2005, \$30. The production in 1980 was 4 million m³ (cubic meters); in 1985, it was already at 9 million m³ and, in 2005, rose to 15 million m³. No other natural material exists that can show such profitability. Sugar cane efficiency, in input/output terms, represents five times the efficiency of ethanol production from beets, wood or wheat straw. With regard to ethanol produced by corn, production from sugar cane is almost eight times as efficient.⁷

According to research from the Food and Agriculture Organization (FAO) of the United Nations,⁸ Brazil is the largest sugar cane producer in the world, representing 33.9% of the market. Its land harvested for sugar cane amounts to 7.8 million hectares and annual production from that land is close to 600 million tons. The second largest producer is India with 4 million hectares and a production total of 236 million tons. China is third with 1.3 million hectares harvested and 90 million tons produced. Of the rest, Thailand, Pakistan and Mexico each represent individually around 10 to 15% of what Brazil produces. It is important to point out that Brazil uses around 2% of its agricultural land for its sugar cane production. Compare this to 72% of agricultural land used for cattle and 16.9% for its yield of grain. Within Brazil, the state of São Paulo is responsible for 60% of all the ethanol produced. The other states that contribute are Parana (8%), Minas Gerais (8%), Goiás (5%) and Mato Grosso (5%), so that almost 90% of the country's production comes from those five states. Of all the sugar cane produced in Brazil, 55% is attributed to ethanol production, 44% to sugar production and 1% to cachaça (a sugar-based alcoholic beverage).

While Brazil uses 355 million hectares of its land towards agriculture, the U.S. uses 270 million, despite that fact that the U.S. is a larger territory. Furthermore, due to its climate, Brazil can harvest two seasons of the year and its topography allows for a mostly mechanical harvest, both factors increasing its productivity as well as reducing its cost. Ethanol production by the hectare in Brazil is 8,000 liters, compared to production in the U.S. at 4,000 liters per hectare. However, U.S. production itself requires more energy, since Brazilian production uses *bagasse* of the actual sugar cane to provide the energy necessary for fuel production.⁹

The ethanol market in the U.S., for the supply of vehicular fuel, is the principal target for Brazilian exportation. Due to laws intended to restrict competition with U.S. suppliers, Brazilian ethanol

⁷ Goldemberg, J; Coelho, ST; Nastari, PM; Lucon O (2003) "Ethanol learning curve- the Brazilian experience", Biomass and Bioenergy, Vol 26/3 pp 301-304.

⁸ FAO (2008) Sugarcane potentials <http://www.fao.org>.

⁹ www.unica.com.br/i_pages/files/pdf_ingles.pdf

suffers a tariff on imports at \$.54 per gallon. The goal of this tax, as declared by the U.S. government, is that the restriction will encourage U.S. domestic ethanol production to continue. The group of U.S. officials who are supported by ethanol producers is very powerful and will not permit a halt on this tax. They frequently accuse the Brazilian government of subsidizing ethanol production and this is just plain false, as the government subsidy ran out in the 1990s.¹⁰ Despite these impediments, Brazilian exportation to the U.S. has dramatically increased recently. In 2005, Brazil exported \$98 million worth of ethanol to the U.S.; in 2006, it was one billion dollars, an increase of over 1000% in a single year. More generally, according to the Brazilian Ministry of Agriculture, Brazilian exportation ethanol goes to: the U.S. and Caribbean Basin Countries (52%), the European Union (28%), and Japan (10%).¹¹

The Kyoto Protocol calls for a reduction of greenhouse gas emissions from carbon-based fuels by 1% by 2010. If all countries were to follow the guide of mixing in 10% ethanol to their gasoline, then, without having to modify vehicle motors for efficiency, etc., gaseous emissions would be reduced by 66 million tons in one year and one of the goals of the Protocol would be met. Brazil has already been mixing 25% of ethanol into their gasoline since 2008. The comparison of vehicular use of ethanol or ethanol-based fuel is, therefore, informative. There are 6.8 million flexible-fuel cars in Brazil versus 7.3 million in the U.S. All the fuel pumps in Brazil already offer ethanol, while in the U.S. only 1% do.

5. Ethanol and social and environmental questions

Some critics frequently complain about Brazilian ethanol production, principally targeting working conditions and effects on the environment. The working conditions on the sugar cane fields are also improving. Only 48% of the factories use manual labor for cutting the cane, and an agreement between producers and the government has been reached that all the cutting will be done mechanically after 2017. Sugar cane activity has had an important social and economic impact on the Brazilian population by providing formal work, above-average salaries, social benefits and other indirect advantages. The Brazilian work force is only about 45% of the population. The sugar cane sector, in 2007, had 72.9% of its workers officially documented in accordance with Brazilian law. Some EMBRAPA studies show that in 1992 this figure was 53.6%, demonstrating a positive trend in the industry in recent years. By comparison, in the best alcohol-producing factories in São Paulo this rate was 93.8% in 2005.¹²

The minimum wage paid to workers in the sugar cane industry is higher than the average Brazilian wage, although it is not the minimum wage sufficient to avoid poverty. The average number of workers who have had 3 years or less of formal schooling in Brazil is 59%. In the southeast regions, this figure is 46%; it is 76% in the northeast. Since wages correlate positively with education, wages are, therefore, higher in the sugar cane regions than in other regions such as the northeast. Again, as a comparison, the wages of São Paulo residents are usually 58% higher than in the northeast.

¹⁰ USDA (2005) Statistics of cotton, tobacco, sugar crops and honey <http://www.usda.gov>.

¹¹ www.agricultura.gov.br

¹² www.embrapa.gov.br

With regard to the environment, the critics focus on pollution from the use of pesticides, soil erosion and the excessive use of water in production processes. The Brazilian Agricultural Research Corporation (EMBRAPA), however, has assessed the nation's ethanol production as clean and as having little damaging impact on the environment. The industry has increasingly designed plants that are more resistant to pests, significantly reducing the need for pesticides. Also, the use of water has significantly decreased both in reprocessing and in use on the actual fields. Even *vinasse*, a late-stage by-product of sugar cane processing, is used as a fertilizer to reduce environmental pollution.¹³

Another criticism made by European environmentalists is that the new plants producing ethanol were causing deforestation in the Amazon forest and threatening other regions that should be preserved such as the Pantanal and the Cerrado, the vegetation of the Brazilian interior. However, there is no ethanol industry in the Pantanal or the Amazon forest. Some studies, like the one published in 2008 by the Netherlands, say that the production of ethanol in Brazil encroaches on areas of the Amazon forest. EMBRAPA states that 99.7% of the Brazilian production of ethanol is processed at least 2,000 kilometers away from the forest, with 60% in the state of São Paulo.

On the other hand, the Cerrado is indeed now being used for new ethanol production. Yet, the carbon debt accrued by biofuel converted from the Cerrado is estimated to be paid back in 17 years, whereas the carbon debt due to production of ethanol from corn in the U.S. would require 93 years to pay back. EMBRAPA estimates that the current production level could be multiplied thirty-fold in the areas where sugar cane is produced in Brazil without affecting the sensitive ecosystems. Only 20% of Brazilian agricultural lands are currently used to grow any crop and Brazil is the world's largest producer of orange juice, sugar cane, soybeans, beef, leather, coffee, sugar and milk, and the world's second largest producer of ethanol, chicken, cotton and pork, to mention only a few.¹⁴

6. The "Ethanol Diplomacy"

In March 2007, the presidents of Brazil and the United States signed a memorandum of understanding (MOU) that transformed the two countries' partnership with respect to production and consumption of renewable energies and, more generally, energy policy. President George W. Bush coined the term "ethanol diplomacy" to characterize this new relationship. Via this MOU, the two presidents agreed that Brazil should lead a group of countries exporting ethanol to the United States, one of the parties most responsible for global warming.

According to the MOU, Brazil would transfer agricultural and industrial technologies to a number of developing countries (Honduras, Nicaragua, Costa Rica, Panama, the Dominican Republic and Haiti), enabling them to enter into a competitive market. It is important to note that some of these countries already take advantage of a customs tariff agreement with the U.S. as signatories to the Central America Free Trade Agreement (CAFTA). Brazil currently exports 26% of all ethanol produced to

¹³ www.embrapa.gov.br

¹⁴ www.embrapa.gov.br

these countries; then, after the ethanol is dehydrated there, it is re-exported to the U.S. duty free. In Jamaica, industrial units have been assembled expressly to dehydrate the hydrated ethanol purchased in Brazil for export to the United States.

At the same time, Brazilian companies are starting to provide equipment to Colombia for the production of ethanol. The Brazilian government wants Colombia to become a base for exporting Brazilian ethanol to the United States without any importation tariff. Brazilian companies in the industry are interested in doing a variety of related business in Colombia, such as selling distilleries to produce ethanol and constructing distribution centers to export the fuel already manufactured. According to the ministry of energy of Colombia, the production of ethanol in the country was 290 million liters per year in 2007. The same source estimates that production will rise somewhere between 11 and 15 billion liters in the coming years, with much of the volume marked for exportation.

"Ethanol diplomacy" has also been extended to some countries of Africa such as Ghana, Angola, Mozambique and Kenya. Technical assistance is provided to them by the EMBRAPA and aims to enable these countries to produce ethanol under conditions similar to those in Brazil.

The United States and Brazil are organizing a list of topics of research related to second-generation biofuels, a list which will incorporate the activities of cooperation agreed to when George Bush came to Brazil in 2007. In 2008, a delegation of researchers from the U.S. was in Brazil to see the projects of the Federal University of Rio de Janeiro (UFRJ), just as, in 2007, a Brazilian mission went to the U.S. to investigate American research in the area of biofuels. "Second-generation" is the name given to technologies that seek to produce ethanol from sources other than corn and sugar cane. One such technology is hydrolysis, used to extract sugar from cellulose from corn fiber, from sugar cane *bagasse* and from other cellulosic material such as wood waste. Another possibility is to bring Brazilian methods to the U.S. Brazilian researchers such as Helena Chum, who manages the biofuels sector at the National Renewable Energy Laboratory in Colorado, a project in progress for thirty years and run in conjunction with the U.S. Department of Energy, believe that sugar cane can be adapted for growth in areas of the U.S. traditionally used only for corn harvesting.

7. American companies in Brazil

The Central Bank of Brazil has reported that, in 1996, the Direct Foreign Investment (DFI) for agribusiness totaled \$568 million or 6% of the DFI in the country for that year. Ten years later, the agribusiness DFI reached \$3.5 billion or 16% of the total registered DFI for 2007, which was \$22.2 billion. In fact, despite the economic crisis begun at the end of the Bush administration, Brazil's recent, significant increase in foreign investment has been mainly from American companies. The focus of recent investment has been ethanol production. New partnerships are frequently announced, as are the purchasing and organization of ethanol-related investment funds.¹⁵

¹⁵ www.bcb.gov.br

According to the consulting group, Datagram, foreigners have invested \$2.2 billion in the sugar cane industry since 2000. Of the list of the ten largest companies in the sector in Brazil, four already have foreign equity participation: Cosan, Bonfim, LDC Bioenergy and Guarani. A fifth company, Santa Elisa, recently partnered with American Global Foods to form the National Sugar and Alcohol Company, whose plan is to invest \$2 billion to build four plants in Goias and Minas Gerais. Founded in 2007 with \$200 million in capital, Brenco (Brazilian Renewable Energy Company) raised \$2 billion in the stock market to invest in Brazil. In that company's plans is the construction of six ethanol plants on the border between Goias, Mato Grosso and Mato Grosso do Sul. The investment is part of an ambitious expansion plan that aims to make Brenco one of the great names of the sector. By 2015, the company will have 10 plants capable of producing about 4 billion gallons of ethanol - 20% of what the entire country produces today. Brenco is controlled by the former president of Petrobras Philippe Reichstul. Two Brenco plants began operating in 2008; another two will start up in 2010. Brenco is also seeking partners to build an alcohol duct (i.e., an ethanol pipeline) of over one thousand kilometers from Alto Taquari in Mato Grosso to the port of Santos in São Paulo. But Brenco has stressed that if agreements are not met in the construction of the alcohol duct, then they will execute the project themselves, estimated at \$1 billion.¹⁶

The U.S. investment bank, Goldman Sachs Group Inc., formalized a partnership with Santelisa Vale SA, a new sugar-cane-ethanol company formed from the merger between Santa Elisa, Vale do Rosario and three other plants in São Paulo. The new company began with a milling of 18.5 million tons of sugar cane. Goldman Sachs entered with a stake of about 15%, contributing about \$400 million. Goldman's resources will be used to remove debts created when Santelisa was formed by the merger of the five Brazilian sugar plants. The plants are controlled by the Biagi family and the Junqueira family, who in February 2007 agreed to conduct the merger.

Another American company, Cargill, after buying 63% of the ethanol production facilities of the Central Energy Valley's Sapucaí Ltda. (Cevasa) in June 2007, is now negotiating for the acquisition of other units this year. Dedini, the world's largest manufacturer of sugar and alcohol plants, has numbers that confirm this trend in foreign investment. According to Dedini's vice president of operations, José Luiz Oliverio, of the 189 projects for new plants that requested a budget from the company, 30% are foreign investors or domestic firms with the resources from outside. This is according to Rio Gas & Oil, 2008.

Even while world production of ethanol is 40 billion liters and Brazil is responsible for a share of around 16 billion, there is real potential for Brazil to increase its participation. The country is by far the most efficient manufacturer with a production cost of \$0.22 per liter of ethanol, \$0.30 ahead of the U.S. and \$0.53 ahead of the European Union. Furthermore, Brazil has enough land to expand its plantations and meet the expected increased demand. The harvest from sugar cane fields in the country should increase from 473 million tons next season to 700 million in 2014. This will require investments in 114 new plants – well beyond the 357 units in operation and 43 under construction in Brazil today.

¹⁶ <http://www.biofuelsdigest.com>.

8. Brazil, the U.S. and the future of the continent

Since the meeting of the presidents in March 2007, Brazil and the U.S. have maintained formal and important informal contacts in order to realize a future trade agreement to increase the flow of oil and derivatives from Brazil to the United States. The new administration of President Barack Obama has already made clear its willingness to support an increase of imports of Brazilian oil. With the trade pact realized -- something that today seems very likely and depends solely on Brazil's attitude -- the most direct result would be the displacement of Venezuela as a supplier to the U.S. energy market. The U.S. currently receives between 40% and 70% of Venezuela's oil production. Of the total U.S. imports of hydrocarbons, 11% comes from Venezuela. The Venezuelan state-owned PDVSA not only sells heavy oil and extra heavy oil to the U.S. but also maintains its own refineries on American soil and an extensive network of gasoline stations that distribute its products. For the United States, a stable commercial relationship with Venezuela in the field of energy has been important. As well, despite the Chavez regime's frequent threats to turn off the crude oil tap and end sales to its number one enemy, trade with the U.S. has become a matter of life and death since it involves a daily amount of some \$80 million.¹⁷

Several companies from the United States have been installed in Brazil with the objective to produce ethanol and export to their country. Significant changes in Brazilian legislation provided they have been encouraged such kind of investments and many others in the agribusiness sector. In the current situation, which indicates changes in industrial policies, which seems the reduction of CO2 emissions and the search for oil replacement. Ethanol attends for this two activities. It seems that Brazil and the United States have good reasons for a strong strategic approach in the coming decades

Some diplomatic and governmental sources from Brasilia have confirmed the interest of the Brazilian government in increasing the Brazilian presence in the U.S. oil market, even if this means a frontal collision with Venezuelan interests. How much Brazil can supplant Venezuela in this way will depend on, first, the amount of crude oil that the Brazilian company, Petrobras, pumps in the years ahead from the pre-salt (boreholes) in the coastal States of Rio de Janeiro and São Paulo, and second, the legal framework agreed to by Washington and Brasilia. By its geographical proximity and the fluidity of the political dialog that has already been established with its new president, it is reasonable to expect that the U.S. will become the great natural buyer of Brazilian oil.

Brazilian government is concerned that the U.S. Department of Defense decided last year to reactivate its Fourth Fleet. Assigned to cruise the seas of the Caribbean and South America, it was originally composed of 11 vessels, including an aircraft carrier and a nuclear submarine. This decision is not mere coincidence. Now more than ever Brazil is "in the radar" of the USA. President Obama should

¹⁷ <https://www.cia.gov/library/publications/the-world-factbook/print/ve.html>.

look to the government of Brazil as its natural ally in South America. Brazil is politically stable, with great economic potential and vast natural wealth. If Brazil continues in its path of institutional and legal strength, respect both for the principles of democracy and the principles of environmental stewardship, and decline in social inequality, then Brazil will be a world leader not only in oil and ethanol production but also in social virtue.