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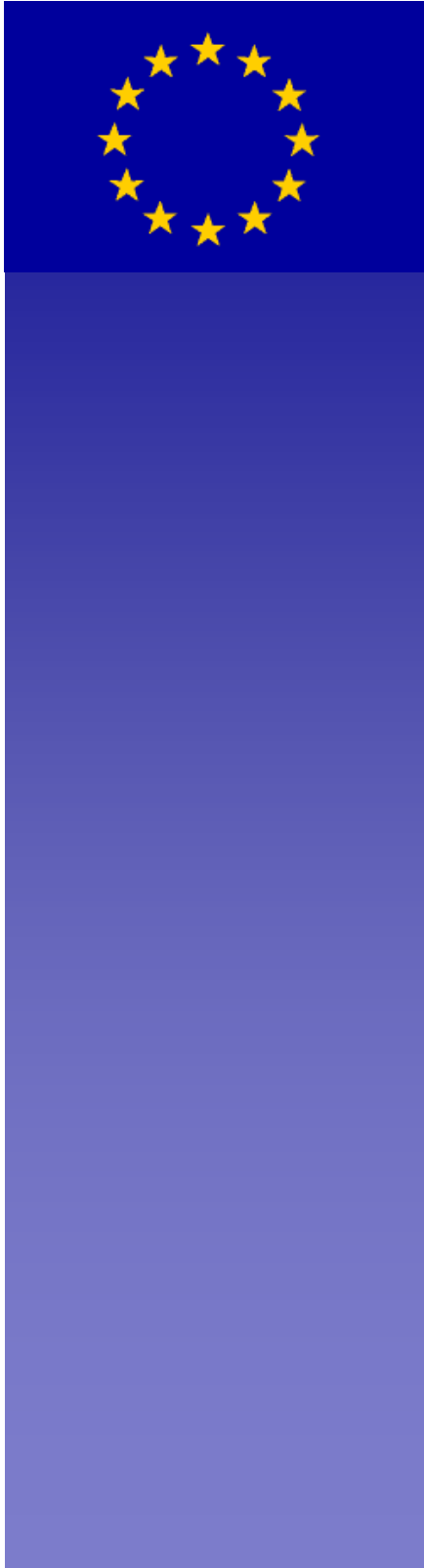
A Brief Energy Outlook for the XXI Century

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Excellence

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A Brief Energy Outlook for the XXI Century

Maria Lorca-Susino ♦

Introduction

The price of oil has surged five-fold since 2003. A variety of factors are used to explain this: turbulence in the Middle East and rising demand in emerging economies such as India and China are the most common ones. In fact, the latest World Economic Outlook (WEO) from the International Monetary Fund (IMF) has declared that the Chinese and Indian economies “account for more than 90 per cent of the rise in consumption of oil products and metals, and 80 per cent of the rise in consumption of grains since 2002.”¹

On Thursday, June 26, 2008, the price of oil broke the all time high of \$140 per barrel. The Organization of Petroleum Exporting Countries (Opec) predicted that this summer the price of oil will range between \$150-170 per barrel. This extraordinarily high price has a detrimental impact on an already fragile world economy, forcing governments to work desperately to find alternatives to help reduce the high energy bill for their economies and people.

According to some experts, one of the most efficient alternatives is bio-ethanol obtained from corn and sugar cane. However, the production of bio-ethanol raises two concerns: One is a trade-off between arable land to grow food or to grow the source for bio-ethanol. The second has to do with the ecological damage associate with growing sugar-cane. However, Brazil proves these two concerns wrong. Brazil has the most successful bio-ethanol program in the world and has obtained its energy independence at no high environmental or food production cost. Brazil’s success story is closely followed by the EU, US, UK, and even China. Furthermore, there are other energy alternatives such as nuclear energy, which in France covers 75% of the national electricity demand. Additionally, there are others sources of energy like the sun, the wind, and the sea that provide free (beyond the generating equipment) and abundant energy, but which require government investment in terms of start-up subsidies to develop them.

Unfortunately, despite the exorbitant current price of oil and the inspiring example of Brazil, governments continue to look for new petroleum resources, rather than new energy alternatives. For example, Cuba recently announced that is has new oil reserves twenty miles north of Havana, and European companies have been the first ones to bid for exploration rights. Lately, Florida Governor Crist has announced that he might change its policy regarding oil exploration off the Florida Cost. This demonstrates that governments still are not fully aware of the great risk globally as a result of the dependency on oil. It seems that a situation similar to that causing “The Great Smog of 1952” in London would have to occur for governments to take the search for new energy sources seriously.

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¹World Economic Outlook, “Housing and the Business Cycle,” International Monetary Fund, April 2008. <http://www.imf.org/external/pubs/ft/weo/2008/01/pdf/text.pdf> (Accessed on June 23, 2008)

The Economic Significance of Oil

The barrel of oil is priced in US dollars, which has a number of consequences: First, countries other than the US have to engage in foreign exchange transactions to buy US dollars to pay for oil. Secondly, oil producing countries receive billions of dollars every day. Depending on the price per barrel and the value of the US dollar, the pain will be felt either on the producers' or on the buyers' side.

Today, the price of oil is extraordinarily high, and the value of the US dollar against major currencies is very low. More specifically, since 2001 the US dollar has depreciated 37% against the English pound, 71% against the euro, and 73% against the Australian dollar. On the buyers' side, this depreciation of the US dollar is helping pay the oil bill of the Eurozone, the UK, China, etc. as a result. For instance, paying their oil bill in the Eurozone is today 71% cheaper than it was in 2001! On the oil producers' side, the reading is "bipolar." On the one hand, these countries are receiving billions of dollars every day. On the other hand, since the value of the dollar they are receiving has decreased against major currencies, those dollars buy them less goods and services; that is, their purchasing power has decreased. Moreover, since most of the producing countries have their currencies pegged to the US dollar, the weakness of the US dollar is driving the value of their own currency down also.

The depreciation of the US dollar was at first regarded as a strategic economic move by the US.² However, this continued depreciation of the US dollar is risking the loss of its dominance to the euro as a global currency. With respect to the price of oil, the low dollar is also not helping the case either. On the one hand, some countries are thinking about the possibility of stopping to price the barrel in US dollars.³ On the other hand, the low dollar is placing particular pressure on oil producing countries with dollar pegs. Kuwait has already left the dollar peg and the United Arab Emirates and Saudi Arabia are thinking about substituting this fixed exchange rate policy for a basket of currencies with heavy weight on the euro. As a result, the US is losing its economic and political influence in a very important geo-political area of the world.

The constant increase in the price of oil is pushing the US, the Eurozone, the UK, and Japan to the verge of an economic recession, even if their governments are in denial. For instance, in the US the producer-price index rose 1.4% in May from the previous month, reflecting the surge in crude-oil prices that pushed gasoline prices up 9.3%. As a consequence, the rising cost of oil is affecting other commodities, which in turn spurs broader increases of prices and wages. Furthermore, in 2007 half of the US foreign trade deficit—US \$400 billion— was the bill of oil. In the US, the combination of soaring prices affecting inflation, and the slowdown in manufacturing and housing as contributing to a recession has the Federal Reserve wondering which one of these two evils is worse and how to defeat it first.

In the Eurozone the situation is also alarming. Despite the strength of the euro against the US dollar, macroeconomic data are a concern for Eurozone member states. For instance, Spain had the best economic performance in recent years. However, it is now facing a substantial economic crisis, reflected in the rising current account deficit, and worsened by a brutal property crunch, which is not assisted by the continued rise in European Central Bank's (ECB) interest rates. The property bubble has burst, and it is bringing a financial crisis in tow. This difficult economic scenario is worsened by the high oil price, which lead to massive angry protests and strikes that at one point had almost paralyzed the country. In Portugal, the situation is similarly

² Maria Lorca-Susino, "The US dollar and the Euro : Deus Ex-Machina," *European Union Miami Analysis (EUMA)*, Vol. 5, No. 9, April 2008. <http://www6.miami.edu/eucenter/LorcaFX-MP%20Theory%20Edi.pdf>

³ The Association Press, "Iran planning to stop using U.S. dollar to price oil, central bank governor says," *The International Herald Tribune*, March 28, 2007. <http://www.iht.com/articles/ap/2007/03/28/business/AS-FIN-Malaysia-Iran-Oil-Dollars.php> (Accessed June 20, 2008)

worrisome, and Portuguese oil truckers had placed the country on the brink of collapse because airports, gas stations, supermarkets, factories etc. were running almost out of supplies.⁴

In general, the latest macroeconomic data show that the Eurozone is close to stagflation with climbing unemployment rates. As an example, the Eurozone's Purchasing Managers' Index⁵ dropped in May for the first time since July 2003. Furthermore, the inflation rate in the Eurozone reached a worrisome 3.7% in May, with 4% is expected in the coming months. This inflation rate in May is the highest in sixteen years and well above the benchmark imposed by the Stability and Growth Pact. This is the reason why the ECB is expected to increase interest rates by a quarter of a point to 4.20%. Governments are blaming the soaring price of oil as the mayor cause for the inflation and the weak economic data in the Eurozone.

The geo-political importance of oil: past, present, and future

Rising oil prices are equivalent to a tax increase which leads to a significant slowdown in economic activity with some time delay. The recent surge in oil prices coupled with rampant food inflation is making governments extremely concerned, since this duet can seriously challenge stable growth worldwide.

The data shows that every recession in the EOCED in the last 75 years was preceded by a sharp rise in the price of oil. Curiously enough, this increase in the price of oil was the result of an armed conflict. The major four conflicts of the past years can be linked, directly or indirectly, to the oil supply, with an immediately following economic slowdown.⁶

The First Oil Crisis began in October 17, 1973, when members of the Organization of Arab Petroleum Exporting Countries (OAPEC)⁷ decided that in retaliation for the Yom Kippur War they would stop shipping oil to those nations that had supported Israel in its conflict with Syria and Egypt. Therefore the US, Western Europe, and Japan suffered a disruption on their oil supply, resulting in an immediate increase in the price of oil. This was worsened when the OAPEC decided to raise world oil prices further. Consequently, the price of a barrel of oil (= 42 gallons or 159 litres) went from under \$10 a barrel to about \$40 a barrel measured in today's dollar. According to the National Bureau of Economic Research (NBER), the economic activity peaked in November 1973 just one month after the crisis erupted, inaugurating the recessionary phase of the business cycle that lasted until March 1975.

Subsequently, in January 1979, the world suffered the Second Oil Crisis when unrest in Iran, which ultimately led to the end of the Shah's reign, became aggravated after Iranian oil refinery workers went on strike in November 1978 to protest against the Shah of Iran. This led to a reduction in production from 6 million barrels per day to 1.5 barrels per **day**⁸, and an increase in the price of oil from \$40 to \$80 in today's dollars as a result. The NBER reported that the world economy again peaked in January 1980, one year after the beginning of the conflict, and entered a recessionary phase reaching a bottom in activity in November **1982**.⁹

During the First (Persian) Gulf War, from August 1990 to February 1991, the world suffered another oil price hike, after it had come down from \$80 per barrel to \$30 in the the 1980s. This armed conflict was directly linked to the defense of oil supply. In fact, the conflict

⁴EFE, "Portugal al borde del colapso," *El Mundo*, June 11, 2008.
<http://www.elmundo.es/mundodinero/2008/06/11/economia/1213194521.html> (Accessed June 20, 2008)

⁵An indicator of the economic health of the manufacturing sector and it is based on five major indicators: new orders, inventory levels, production, supplier deliveries, and the employment environment.

⁶It is not the purpose of this particular article to elaborate on the nuts and bolts of the relationship between conflict, oil price and economic slowdown per se. That might be the topic of a future article.

⁷consisting of the Arab members of OPEC plus Egypt and Syria

⁸Times, "Another Crisis for the Shah", November 13, 1978.
<http://www.time.com/time/magazine/article/0,9171,946149,00.html>

⁹National Bureau of Economic Research, "January 7, 2008 Memo from the Business Cycle Dating Committee."
<http://www.nber.org/cycles/main.html> (Accessed June 21, 2008)

started when in 1990 Iraq accused Kuwait of stealing Iraq's oil through directional (slant) drilling. In order to defend Iraqi oil, Iraq invaded Kuwait and took over the entire country's oil production. During this bellicose period, oil prices spiked again, hitting \$40 a barrel and according to the NBER, economic activity reached bottom in November 1991. Soon after the end of the conflict oil prices returned to a more affordable \$10 per barrel for the rest of the 1990s,¹⁰ inaugurating an expansionary cycle of the new century that lasted until March 2001, when the economy **peaked**¹¹

Finally, the *Iraq War*, or Second (Persian) Gulf War, as an ongoing conflict that began in March 2003, has apparently nothing to do with the possible disruption of oil supply. Rather, it was started on suspicions about Iraq's alleged possession and pursuit of weapons of mass destruction as a security threat to the US, Europe, and the Middle East. However, there were also secondary motivations, such as stopping Iraqi human rights abuses, plans to spread democracy in the area, and the defense of Iraq's oil reserves. In fact, Paul Wolfowitz declared that "the real motive was that Iraq is 'swimming' in oil"¹². When the war began, the price of a barrel oil was around \$20, but, since then, it has been raising non-stop to hit an all time record high of \$144 on July 3, 2008.

Today's exorbitant price of oil is making many wonder if the world is destined to a *third oil crisis*. This crisis would result in a painful worldwide economic slowdown, inflation, increased unemployment, and political instability with after-effects that will last for decades. It is important to remember that the first oil shock in 1973 left Europe with a legacy of inflation and stagnation for a decade and a recession until the early 1980s. This crisis was more severely felt in Europe than in the US, and taught that Europe had to work harder towards energy independence. In a reversal of "fortune" now, since the Eurozone and the UK are paying their US dollar oil-invoices with a strong currency, it is buying their economy some time.

Since history tends to repeat itself, the EU Commission has put together "An EU Strategy for Biofuels", aimed at exploring the oil dependency dilemma. The commission has estimated that "in the EU, transport is responsible for an estimated 21% of all green house gas emissions, which contribute to global warming, and the percentage is rising."¹³ However, each European country is working on its own particular solutions. For instance, in the UK "the government's Renewable Transport Fuel Obligations demands that 5% of all motorcar fuel must come from renewable sources by 2010."¹⁴

The US has also begun to actively address its energy independence. President Bush signed in 2007 the "Energy Independence and Security Act of 2007" which pushes "fuel producers to use at least 36 billion gallon of biofuel in 2022. This is a nearly fivefold increase over current levels."¹⁵ Curiously enough, the incentives for the EU and the US to adopt biofuel are different. While for the US the main political driver is to reduce its dependency on imported oil¹⁶, for the EU the main political driver is also environmental.¹⁷ Therefore, it has become a

¹⁰ CBC News, "The Oil of Price. Marching to \$100?" July 18, 2007. <http://www.cbc.ca/news/background/oil/> (Accessed June 16, 2008)

¹¹ National Bureau of Economic Research, "January 7, 2008 Memo from the Business Cycle Dating Committee." <http://www.nber.org/cycles/main.html> (Accessed June 21, 2008)

¹² George Wright, "Wolfowitz: Iraq war was about oil," *Guardian*, June 4, 2003. <http://www.whatreallyhappened.com/aboutoil.htm> (Accessed June 20, 2008)

¹³ Commission of the European Communities, "An EU Strategy for Biofuels," Communication from the Commission, Brussels, February, 2006 http://ec.europa.eu/agriculture/biomass/biofuel/com2006_34_en.pdf

¹⁴ Jorn Madslie, "Biofuel Raises Global Dilemmas," *BBC News*, January 17, 2006. <http://news.bbc.co.uk/1/hi/business/4603272.stm> (Accessed June 15, 2008).

¹⁵ U.S. Department of Energy, "President Bush Signs H.R. 6, the Energy Independence and Security Act of 2007," The White House, December 19, 2007. <http://www.whitehouse.gov/news/releases/2007/12/20071219-6.html> (Accessed June 24, 2008).

¹⁶ U.S. Department of Energy, "Utilities to Join DOE's Plug-In Hybrid Efforts," Energy Efficiency and Renewable Energy, June 20, 2008. http://www.eere.energy.gov/news/daily.cfm/hp_news_id=121. (Accessed June 25, 2008)

worldwide priority to find ways to not only reduce damaging emission, but to also reduce over-dependence on imported oil.

Oil settlements increase the money transferred from the private sector, such as Western and Asian consumers and businesses, to government entities such as the Saudi royal family, the Russian government, and African dictators. For every \$1 increase in oil prices, Kuwait will earn \$79 million a month, and Saudi Arabia an additional \$295 million a month.¹⁸ An example with oil at \$70 per barrel, a country like Iran can get US\$70 billion per year in oil exports revenues. It is believed that only half of that money goes to pay for public services, such as food, oil, transportation, etc.

Comparing energy sources historically as proceeding from coal production, which dominated the world energy market in the 19th century, but eventually became less relevant in the 20th century, when oil became more dominant. Eventually, oil will also become less relevant as alternative sources of energy are discovered. As oil becomes irrelevant, one could speculate that political turmoil and even revolutions will become the norm among oil-producing countries, relying on the use of oil prices as political leverage. In fact, studies have been undertaken which indicate that if the oil price were to decrease to \$20 per barrel, a revolutionary wave might swipe the Middle East. Russia also uses energy as a tool to push her neighbors (Ukraine, Georgia, etc) to toe the line. Today, the price of oil is used by some countries to increase its political and economic leverage. Therefore, if the US is pursuing a regime change, one way would be for it to achieve petroleum independence.

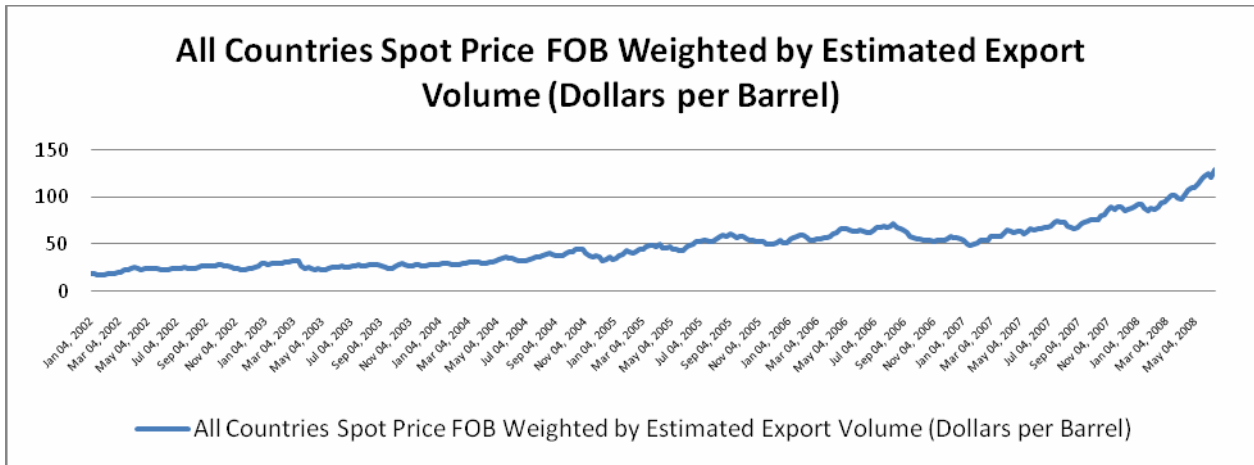
The price of gas: A quick overview

Understanding how the cost of a barrel with 42 gallons of oil priced at \$130 is transformed into \$4 per gallon at the pump is not an easy task. In fact, nowadays, more and more scholars and politicians are trying to increase the transparency of the oil pricing mechanism, which previously was understood only by financiers. Unfortunately, government, particularly in European countries, do not seem to realize the final effect of all the high taxes on the real cost of oil paid at the pump, instead, governments are just blaming ‘the speculators’ and their contracts in oil futures markets as the major factor for today’s high oil prices.

In layman’s terms, in the financial world commodities are traded everyday at a price that is constantly changing based on the interaction of demand and supply. This constantly changing price is called the *spot price*, which represents the price that the demand side of the transaction (buyer) will have to pay to the supply side of the transaction (seller). The following graph shows the evolution of the average oil spot price since January 2002:

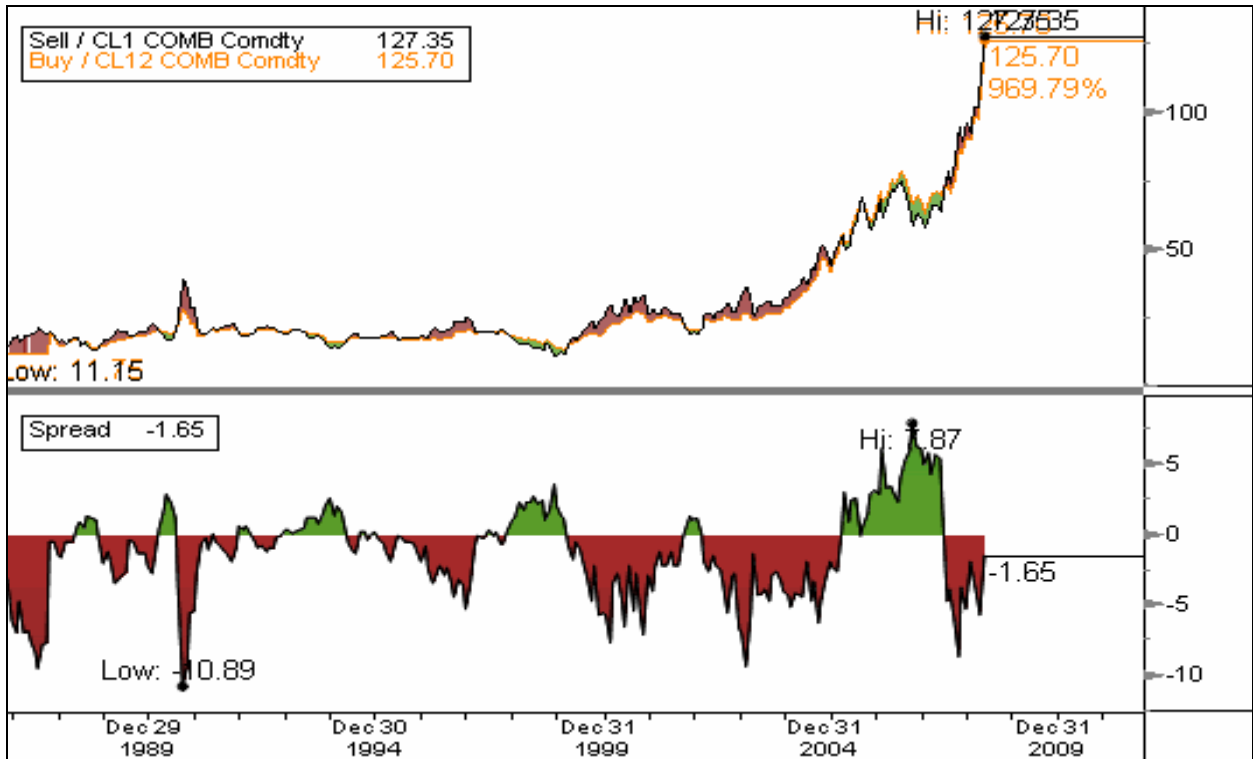
¹⁷ Euroactive, “Green Cars,” Policy Section, August 17, 2004. <http://www.euractiv.com/en/sustainability/green-cars/article-117504>

¹⁸ Ladene Nasser and Mathew Brown, “Kuwait Says Oil Over \$100 Is too High; Support Saudis,” Bloomberg.com, <http://www.bloomberg.com/apps/news?pid=20601087&sid=aJoz82F86Wis&refer=home> (Accessed on June 30, 2008)



Source: The data was collected manually from the Energy Information Administration (<http://www.eia.doe.gov/>) and was recorded in Excel to create the above graph.

Furthermore, there is an additional financial instrument, a derivative, which allows investors to buy *Future Contracts* on the commodities market. A future contract is an agreement made and traded on the exchange between two parties to buy or sell a commodity at a particular *time in the future for a pre-defined price today*. This type of transaction takes place in the *futures market*. Hence, oil as a commodity with a spot price *and* a future price is traded in the New York Mercantile Exchange (NYMEX). The importance of the future contract, and the reason why it is currently under attack, is that the future market indicates what the future price of oil is expected to be on a particular delivery day in the future. There is always going to be a difference (or spread) between the spot price and the future price of oil. This difference can benefit those engaged in future trading. For instance, an airline must buy oil today and will pay the spot price. But in order to secure a specific oil price in the future, the airline will buy oil in the futures market. In this case, the airline is not buying future contracts of oil to make a benefit but to ensure that planes will have more affordable oil available in the future. However, this futures market is also available to investors looking to make a profit with the spread. Alistair Darling, Britain's Chancellor of the Exchequer, has stated that "it is sometimes difficult to distinguish between an airline that may hedge its fuel price, which is perfectly sensible planning, and someone who is speculating or even gambling on the price of oil." The graph below shows the evolution of the future of oil as well as the spread.



Source: Bloomberg

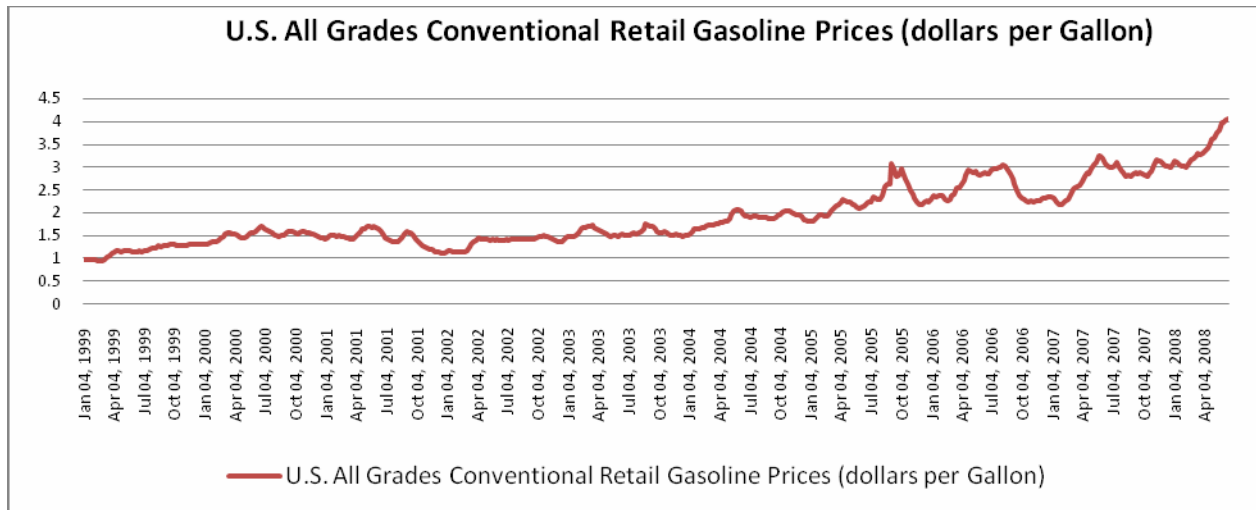
According to the Energy Information Administration, between 2000-2007¹⁹ the average retail price for a gallon of gas in the US was \$1.91, and in 2007 the average price was \$2.80. The table below shows the different percentage costs that contribute to the final price of oil at the pump.²⁰ It is interesting to note how the increase in the price of oil is reflected in the percentage labeled “crude oil” with an increase of 10 per cent from 2000-2007 to 2007. Furthermore, it seems that in order to balance out the increase in the price of oil, federal and state taxes as well as the costs of distribution and marketing were reduced.

	2000 to 2007 Average Retail Price: \$1.91 Average barrel price:	2007 Average Retail Price: \$2.80 Average barrel price:
Distribution & Marketing	12%	10%
Refining Costs & Profits	16%	17%
Federal & State Taxes	24%	15%
Crude Oil	48%	58%

¹⁹ Official Energy Statistics from the U.S. Government

²⁰ Energy Information Administration, “A Primer on Gasoline Prices,” Energy Information Administration Prices, Brochure #: DOE/EIA-X040, May 2008. http://www.howstuffworks.com/framed.htm?parent=gas-price.htm&url=http://tonto.eia.doe.gov/cfapps/STEO_Query/steotables.cfm?periodType=Annual&startYear=2005&startMonth=1&endYear=2009&endMonth=12&tableNumber=9 (Accessed June 13, 2008)

The graph below shows the weekly evolution of the average price of all gasoline grades in the US from January 4, 1999 until June 16, 2008. Since March 15, 1999, the average price of gas has never been below \$1 per gallon in the US. On that day, the gallon was at \$0.997.



Source: The data was collected manually from the Energy Information Administration (<http://www.eia.doe.gov/>) and was recorded in excel to create the above graph.

In the European Union the price of oil is not only high but exorbitant. In the EU, the price of crude oil represents around 20% of the final price at the pump. The rest represents taxes, of which the value-added tax (VAT) on gasoline ranges from 15%-20%. As a result, by comparison nowadays in the US a gallon of Super averages approximately \$4, while in the EU the price of Super is around \$9 per gallon.

This excessive price in Europe has led to massive angry protests in London, Madrid, and Paris. As a consequence, French President N. Sarkozy was supported by the Spanish and Italian governments in his proposal to cut European fuel taxes to provide some relief at the pump. Specifically, he proposed suspending most value-added tax (VAT) on gas “which would mean \$267 million in saving per quarter to those hit hardest by the increase in price”²¹.

For world oil producers, the current situation is a doubled-edged sword. On the one hand, they are making record profits, but on the other hand they correctly fear that high prices could accelerate the development of alternative energy sources that would reduce demand for their oil. In fact, Brazil has almost achieved oil independence. In Brazil bioethanol fuel programs were instituted during the first oil crisis claiming patriotic, and not financial or environmental reasons. Ever since then cars have been running on biofuel there, outselling ordinary cars. In fact, Brazil has the world’s first sustainable biofuel economy, where biofuel is ethanol fuel derived from sugar cane. However, “Brazil’s path has taken 30 years of effort, required several billion dollars in incentives and involved many missteps.”²² In the EU, Sweden is the most advanced in working towards its oil independence. Even Ford’s flex-fuel models are now outselling ordinary petrol and diesel cars.

²¹ Bruce Crumley, “Think Gas is High? Try Europe,” *Time*, May 28, 2008.

<http://www.time.com/time/world/article/0,8599,1809900,00.html> (Accessed June 14, 2008).

²² Larry Rohter, “With Big Boost from Sugar Cane, Brazil is Satisfying its Fuel Needs,” *The New York Times*, April 10, 2006. <http://www.nytimes.com/2006/04/10/world/americas/10brazil.html> (Accessed June 19, 2008)

The president of the Organization of Petroleum Exporting Countries (OPEC), Chakib Khelil, declared on June 14, 2008 that the cartel was not going to make any decision about production levels until its September 9 meeting in Vienna.²³ However, an emergency meeting took place on Sunday, June 22, 2008, to discuss the alarming situation of price and availability of oil reserves. After this meeting, Saudi Arabia decided to increase its current 9.45 million barrels per day production by 200,000 million barrels per day, as it is becoming increasingly nervous about the political and economic consequences of the current astronomical prices.²⁴ However, this amount was less than the half million barrels that Saudi Arabia had previously announced²⁵, raising fears about the availability of oil on world markets.

As of today, oil supply faces two threats: On the one hand, it is vulnerable to major terrorist attacks in strategic oil producing countries such as Nigeria and Angola. Nigeria e.g. has a sharp drop in output from 2.5 million barrels a day to 1.5 million due to attacks on production facilities.²⁶ Angola has been crippled as well by terrorist attacks.²⁷ On the other hand, oil is a limited resource and, in fact, there are many *Malthusian* reports forecasting that since oil is not a renewable source of energy, the world will run out of oil in the next fifty years, given the current rise in demand. The following table represents the demand of oil since 1994. It shows how in the US, Japan, and Europe the demand has been stable since 1994, but how China and other Asian countries have been dramatically increasing their demand in the past years.

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
OECD	44.44	44.9	45.98	46.72	46.89	47.81	47.88	47.94	47.89	48.6	49.36	49.66	49.34	48.95	48.71	48.79
U.S. (50 States)	17.72	17.72	18.31	18.62	18.92	19.52	19.7	19.65	19.76	20.03	20.73	20.8	20.69	20.7	20.41	20.55
Canada	1.77	1.81	1.86	1.95	1.94	2.03	2.03	2.06	2.08	2.21	2.3	2.3	2.26	2.34	2.36	2.35
Europe	14.37	14.66	14.97	15.11	15.42	15.33	15.19	15.37	15.31	15.44	15.48	15.61	15.63	15.28	15.26	15.26
Japan	5.65	5.69	5.74	5.7	5.5	5.61	5.5	5.39	5.3	5.42	5.29	5.31	5.16	4.97	5.01	4.96
Former Soviet Union	4.85	4.6	4.03	3.89	3.8	3.71	3.72	3.78	3.83	3.91	4.04	4.08	4.21	4.28	4.41	4.54
China	3.16	3.36	3.61	3.92	4.11	4.36	4.8	4.92	5.16	5.58	6.44	6.72	7.2	7.58	8.02	8.42
Other Asia	5.47	5.9	6.35	6.67	6.75	7.16	7.34	7.49	7.72	7.92	8.37	8.52	8.66	8.78	8.83	8.93
Total World Consumption	68.87	70.07	71.63	73.37	74.01	75.67	76.66	77.4	78.04	79.62	82.33	83.65	84.62	85.38	86.38	87.7

Source: The data was collected manually from the Energy Information Administration (<http://www.eia.doe.gov/>) and was recorded in Excel to create the above table.

Only time will tell whether these reports, forecasting the end in oil resources in the near future, are correct or not. But one thing is certain: oil is a *nonrenewable scared resource*. In fact,

²³ Associate Press, "G-8 Raises Alarm over Rising Oil Prices," *msnbc.com*, June 14, 2008. <http://www.msnbc.msn.com/id/25164953/> (Accessed June 20, 2008)

²⁴ Andrew England and Carola Hoyos, "Saudi Oil Boost Fails to Alleviate Concerns," *Financial Times*, June 22, 2008. <http://www.ft.com/cms/s/0/9c2756b4-4035-11dd-bd48-0000779fd2ac.html> (Accessed June 22, 2008).

²⁵ Associate Press, "G-8 raises alarm over rising oil prices," *msnbc.com*, June 14, 2008. <http://www.msnbc.msn.com/id/25164953/> (Accessed June 20, 2008).

²⁶ "Nigerian Attack Closes Oilfield," *BBC News*, June 20, 2008. <http://news.bbc.co.uk/2/hi/africa/7463288.stm> (Accessed June 20, 2008).

²⁷ "Deadly attack' in Angola enclave," *BBC News*, March 7, 2008. <http://news.bbc.co.uk/2/hi/africa/7282971.stm> (Accessed June 19, 2008)

it is widely accepted that the production in Russia, Kuwait, Mexico, the North Sea, and Saudi Arabia has peaked. Although Brazil has recently interestingly reported the possibility of enormous new oil reserves approximately ten km *below* sea level and at a great distance offshore. Exploration of these Brazilian fields lie approximately ten years and billions of dollars in the future, but will also have massive environmental costs/damages associated with their exploration.

So, one must ask about which alternatives are available in the world to substitute for oil in the near future. Unfortunately, governments and society in general have not paid sufficient attention to this question. Only recently has this question made constant headlines due to the recently skyrocketing price of oil. While during the oil crisis of 1970s the only alternative car manufacturers had available were electric cars, today new technological breakthroughs have widened the options.

Other Sources of Energy: Could bio-ethanol fuel be the alternative?

In the 1950s Harold Bate, a farmer from Devonshire (England), developed a “digester” which turned decomposing livestock droppings into methane on which he ran his car and truck at little cost²⁸. While Bate’s idea never caught on back then, many believed it demonstrated the potential of nature in providing us with cheap, clean, and plentiful alternatives to petroleum. In fact, Henry Ford “predicted that ‘ethyl alcohol’ is the fuel of the future.”²⁹

Scientists have since studied whether bio-ethanol fuel could become an alternative to gasoline. However, a distinction should be made. Ethanol is produced by fermentation of sugar from petroleum or a wide variety of crops. The by-product obtained from petroleum is called ethanol, while the by-product obtained from crops is called bio-ethanol. Nowadays, much of the ethanol produced is a petroleum product. Today’s interest in ethanol lies in its production as bio-ethanol, which is obtained from starch or sugar found in a variety of crops such as sugar cane, sugar beet, barley, potatoes, sunflower, molasses, corn, grain, wheat, and cotton. As an incentive for the production of bio-ethanol, most governments’ “new tax credits for ethanol in gasoline are intended for ‘bio-ethanol-, or renewable ethanol’, and not petroleum-derived ethanol.”³⁰

Sugar primarily comes from sugar cane or from sugar beet, but generally sugar factories can process both types of crop. From an agricultural point of view, both types of crop are relatively easy to grow. While sugar cane requires more water and tolerates hot climates better than sugar beet, Napoleon encouraged the cultivation of beets in Europe during the Napoleonic Wars, when the British Navy blockaded the French ports and cane sugar from the West Indies could not reach French tables. For this curious reason, sugar cane has been traditionally farmed in the Caribbean countries and South America, while sugar beet is more common in Europe.

Today reliable cheap sources of energy are essential to cope with the challenges of globalization. Biofuels are a direct substitute for fossil fuels in transport. Although biofuels are still more costly than fossil fuels, improving biofuel production by making it cheaper and more environmentally-friendly has recently become a priority among many governments. Moreover, supporting biofuels with the objective of reducing greenhouse gas emissions would not only help the planet but also offer new opportunities to diversify income and employment. For example, the production of biofuels from suitable feed stocks is generating economic and environmental benefits in a number of developing countries such as Malaysia, Indonesia, and Philippines, in addition to Brazil, which is the world’s leading producer of bio-ethanol. In fact, Brazil, which

²⁸ Mother Earth News, “Jerry Friedburg on Harold Bate,” June 1972, <http://www.motherearthnews.com/Green-Transportation/1972-05-01/Jerry-Friedberg-on-Harold-Bate.aspx>

²⁹ Larry Rohter, “With Big Boost from Sugar Cane, Brazil is Satisfying its Fuel Needs,” *The New York Times*, April 10, 2006. <http://www.nytimes.com/2006/04/10/world/americas/10brazil.html> (Accessed June 19, 2008)

³⁰ Murry Tarmers, “Distinguishing Between ‘Bio-ethanol’ and Petroleum Ethanol,” *Ethanol Producer Magazine*, June 2006, http://ethanolproducer.com/article-print.jsp?article_id=2077 (Accessed June 26, 2008)

obtains bio-ethanol fuel from sugar cane,³¹ has the largest and most successful bio-fuel program in the world currently competing with fossil fuels, supported by the fact that “more than 70 percent of the automobiles sold in Brazil, (...), have flex fuel engines”³² which allows them to run on gasoline mixed with varying levels of bioethanol.

In countries where a large-scale expansion of feedstock production is likely to take place, there are two concerns. On the one hand, there is an environmental concern and many climate change experts claim that new fuels pose an environmental threat since demand for biofuel crops leads to the decimation of tropical forests. However, in Brazil

industry and government officials say that such concerns are unwarranted.

They argue that sugar cane’s expanding frontiers are an environmental plus because it is putting largely abandoned or degraded pasture land back into production. And of course, ethanol burns far cleaner than fossil fuels.³³

On the other hand, there is a social concern related particularly to a competition between biofuels and food production. Noam Chomsky has openly blamed the production of corn-based bio-ethanol to have caused “tortilla prices jumping by more than 50 per cent” in Mexico, causing massive angry protests in Mexico DF.³⁴

Despite these two concerns, the price of oil is reaching such unsustainable level for the world economy that agencies, such as Food and Agricultural Organization of the United Nation (FAO) welcome the use of ethanol as an alternative source of energy regardless. In fact, the FAO has declared that

Apart from concerns over high oil prices, the growing interest in ethanol fuel has other notable motives. These include the need to diversify energy sources, the desire of many countries to meet their greenhouse gas targets, and the need to stabilize commodity prices and cut down on agricultural subsidies in line with WTO provision.³⁵

Nowadays, producing bio-ethanol from corn is not longer the goal. The goal is rather to produce sugar cane-based ethanol. Producing sugar-based ethanol would not imply any dramatic tradeoff between what Chomsky describes as between “starving the poor” or filling-up the tank of the capitalist world.³⁶

Today, sugar is not traded in a free market, particularly in the EU. In 1968 the Common Market Organization (CMO) in the sugar sector was set up to ensure a fair income to Community producers and self-supply of the Community market.³⁷ The problem is that the supply of sugar has been higher than the demand for sugar. As a consequence, during the past forty years the EU has been establishing production quotas to artificially maintain a price that has been set at 632

³¹ Larry Rohter, “With Big Boost from Sugar Cane, Brazil is Satisfying Its Fuel Needs,” *The New York Times*, April 10, 2006. http://www.nytimes.com/2006/04/10/world/americas/10brazil.html?_r=1&sq=Bush%20Brazil%20ethanol&st=nyt&oref=slogin&scp=5&pagewanted=print (Accessed June 24).

³² Larry Rohter, “With Big Boost from Sugar Cane, Brazil is Satisfying its Fuel Needs,” *The New York Times*, April 10, 2006. <http://www.nytimes.com/2006/04/10/world/americas/10brazil.html> (Accessed June 19, 2008)

³³ Larry Rohter, “With Big Boost from Sugar Cane, Brazil is Satisfying its Fuel Needs,” *The New York Times*, April 10, 2006. <http://www.nytimes.com/2006/04/10/world/americas/10brazil.html> (Accessed June 19, 2008)

³⁴ Richard Doornbosch and Ronald Steenblik, “Biofuels: Is the Cure Worse than the Disease?” Organization for Economic Co-operation and Development, Round Table on Sustainable Development, Paris, 11-12 September 2007. <http://media.ft.com/cms/fb8b5078-5fdb-11dc-b0fe-0000779fd2ac.pdf> (Accessed June 25, 2008)

³⁵ Food and Agricultural Organization, “The Rise in Crude Oil Prices Stimulates Ethanol-Related Demand for Agricultural Commodities.” http://www.fao.org/es/esc/en/15/106/highlight_107.html (Accessed on June 22, 2008)

³⁶ Noam Chomsky, “Starving the Poor,” *Khaleej Times*, May 15, 2007. <http://www.chomsky.info/articles/20070515.htm> (Accessed June 18, 2008)

³⁷ Directorate C. Markets in crop Products, “A Description of the Common Organisation of the Market in Sugar,” European Commission, Agriculture Directorate-General, September 2004. http://ec.europa.eu/agriculture/markets/sugar/reports/descri_en.pdf (Accessed on June 23, 2008)

euros per ton. This is an extremely high price at four times the world price, and was intended to help European sugar growers transition out of growing sugar. This means that the EU has been paying about 1.5 billion euros per year in support of the sugar sector. Moreover, often sugar is bought from the farmer at this high price and stored, which is referred to as *intervention buying*. However, following a formal complaint from Australia, Brazil, and Thailand, the WTO ruled for a reduction to those subsidies. Hence the EU agreed to cut that price by 36% and compensate farmers willing to abandon growing sugar with 64.2% of revenues lost due to this price cut. However, this cut in price will also negatively affect some African Caribbean Pacific countries with access to the highly subsidized European sugar market because they will also suffer a reduction in the price they receive.

This indicates a global surplus in sugar production, which could be used as a source to produce bio-ethanol instead of being controlled, penalized, overpaid, and stored. It is clear that this will open a new market for the excess supply of sugar which will specially benefit developing sugar producing countries, most of which being former European colonies, which are struggling to survive as a result of the sugar subsidies. By growing sugar cane and sugar beet crops to produce bio-fuel, countries would create employment and improve their living standards. This new market for sugar would not represent a tradeoff between feeding the poor and filling-up gas tanks.

Still, investing in bio-ethanol is just one of the many alternatives that countries can pursue. The second most important source of energy is *nuclear energy*. However nuclear energy, particularly in Europe, makes many go back to the memory of the 1986 Chernobyl nuclear disaster.³⁸ Nuclear energy in Europe is almost identified with environmental hazards.³⁹ Nevertheless, Chernobyl must be put in perspective since it took place when the Soviet Union was disintegrating economically and politically, which took a heavy toll on the already obsolete technology, run with inadequate maintenance and unavailable resources. Today the nuclear industry has greatly improved since then, and it has become extremely attractive in many EU countries and in the US.

In the EU, France derives over 75% of its electricity from nuclear energy with 59 nuclear reactors operated by Electricité de France (EdF), with the construction of a new unit at Flamanville approved by the EdF-board in May 2006.⁴⁰ Germany has 17 reactors, which provide one third of its electricity.⁴¹ Finland has four nuclear reactors, providing 27% of its electricity. A fifth reactor was approved by the government in 2002 on economic, energy security, and environmental grounds. This fifth unit is under construction and expected to be fully operative by 2011.⁴² The UK has 19 reactors, generating a fifth of its electricity, with all but one of these retired by 2023 as new-generation plants are expected to be on line about 2017. In 2006, UK nuclear plants generated 19% of UK electricity, compared with 36% from gas and 38% from coal.⁴³ Finally, Spain⁴⁴ has 8 nuclear reactors generating a fifth of its electricity, and the government of President Zapatero is talking about the construction of five more to be completed by 2030⁴⁵.

³⁸ World Nuclear Association, "Chernobyl Accident." <http://www.world-nuclear.org/info/chernobyl/inf07.html>

³⁹ Exxon Valdez in Alaska in 1989, or the Prestige in Spain in 2002

⁴⁰ World Nuclear Association, "Nuclear Power in France." <http://www.world-nuclear.org/info/inf40.html> (Accessed on June 27, 2008)

⁴¹ World Nuclear Association, "Nuclear Power in Germany." <http://www.world-nuclear.org/info/inf43.html> (Accessed on June 27, 2008)

⁴² World Nuclear Association, "Nuclear Power in Finland." <http://www.world-nuclear.org/info/inf76.html> (Accessed on June 27, 2008)

⁴³ World Nuclear Association, "Nuclear Power in UK." <http://www.world-nuclear.org/info/inf84.html> (Accessed on June 27, 2008)

⁴⁴ World Nuclear Association, "Nuclear Power in Spain." <http://www.world-nuclear.org/info/inf85.html> (Accessed on June 27, 2008)

⁴⁵ http://www.libertaddigital.com/noticias/kw/agua/co/emisiones/energia/kioto/nuclear/renovables/kw/noticia_

Additionally, there are other energy resources available, such as those provided by the sun and the sea. However the problem today is the difficulty to store the energy produced, which will be lost if not used at the time of production. The big challenge for this century is to come with what I believe could become a 'global electric network' which could produce, store, and transfer solar and marine energy around the world. For instance, it would be possible to install solar plants in strategic parts of the world such as the Australian and the Gobi deserts where the energy produced could be stored and transported to "darker" areas such as northern Europe, where they need it most. As of today, we just can initiate agreements such as the one signed on June 27, 2008, which doubles the electric interconnection between France and Spain, for the purpose of improving Spain's capacity to buy electricity from France that was likely produced by one of its 59 nuclear reactors.⁴⁶

What is in it for Cuba?

The embargo of Cuba has been US policy since 1961. However, this policy, like any other policy, is made on the basis of a cost-benefit analysis. In this case, the cost of the embargo has been measured in economic terms. From the cost point of view, the US government belief is that Cuba has very little to offer to the US; hence, the embargo has a very low cost to the US. The benefit of the embargo is measured in political terms in an effort to undermine the regime and deprive it of resources to loosen Castro's grip on power. From a political point of view the US government also views the embargo as living proof of what Communists regimes are about.

Recently the EU has lifted diplomatic sanctions on Cuba, which banned high-level Cuban officials from visiting UE nations. The sanctions were imposed in 2003 after concerns were raised about human rights in Cuba, after its government rounded up 75 dissidents that year. Nevertheless, these sanctions were suspended in 2005, though not completely removed. Lifting them now after Raul Castro has taken over for his brother could be considered a symbolic move. This movement has been criticized on both side of the Atlantic. In the US, the government has expressed its disappointment, and White House deputy press secretary Gordon Johndroe said that "We think the Castros need to take a number of steps to improve the human rights conditions for ordinary Cubans before any sanctions are lifted."⁴⁷ In the EU, Sweden has declared that the changes are mainly cosmetic, particularly in the area of human rights.⁴⁸ Nevertheless, the EU External Relations Commissioner Benita Ferrero-Waldner said that the EU would continue to monitor human rights conditions in Cuba.

Since Fidel Castro temporarily handed power to his brother Raul, there still is "no talk of competition, market, strikes, or other action against management, or turning state-owned business into co-operatives."⁴⁹ However, Raul is determined to improve the system by introducing a business model that he developed when he was defense minister, which he calls "*perfeccionamiento empresarial*." This is a military business model which, according to Phil Peters, an expert on Cuba from the Lexington Institute in Virginia, "has no exact analogy in capitalist economies and is not borrowed from other socialist countries' models of reform."⁵⁰

1276333010.html

⁴⁶ La Moncloa, "España y Francia firman un acuerdo histórico que duplica la interconexión eléctrica entre ambos países," Presidencia del Gobierno, June 27, 2008. <http://www.la-moncloa.es/ActualidadHome/2008/270608AltoNivel.htm>. (Accessed on June 28, 2008)

⁴⁷ AP, "EU to Drop Sanctions Against Cuba," *CBS News*, June 20, 2008. http://www.cbsnews.com/stories/2008/06/20/world/main4197938.shtml?source=RSSAttr=HOME_4197938 (Accessed June 25, 2008)

⁴⁸ MSNBC News Services, "EU agrees to lift sanctions on Cuba," *MSNBC.com*, June 19, 2008. <http://www.msnbc.msn.com/id/25272269/#storyContinued> (Accessed June 24, 2008)

⁴⁹ Marc Frank, "Raúl Castro's Cuba remains keen to foster a statist economy," *Financial Times*, June 24, 2008. <http://www.ft.com/cms/s/0/54f51c20-4186-11dd-9661-0000779fd2ac.html> (Accessed June 25, 2008).

⁵⁰ Marc Frank, "Raúl Castro's Cuba remains keen to foster a statist economy," *Financial Times*, June 24, 2008. <http://www.ft.com/cms/s/0/54f51c20-4186-11dd-9661-0000779fd2ac.html> (Accessed June 25, 2008).

Nevertheless, under this plan Cuba would eventually enter the market economy as China and Vietnam have done in the past despite their Communist regimes. One way in which Cuba could do so is by gaining a competitive advantage in bio-ethanol fuel production due to its capacity to produce sugar cane. In fact, China is already using its natural available resources to not only obtain its energy independence but also to develop a new industry. China Daily reported on April 2008 that Guangxi Zhuang Autonomous Regions had become the 10th Chinese locality to replace gasoline and biodiesel oil with bio-ethanol out of environmental and energy concerns. In order to meet this transformation, China has built a production in Guangxi to “commercially produce ethanol fuel with cassava instead of grain.”⁵¹

If China is taking this road against all odds, given its population, regime, and material difficulties, Cuba could achieve a great competitive advantage due to its great facility to produce sugar cane. Already in 1892 the New York Times reported that “from carefully gathered statistics the crop of 1892 amounted to 972,789 tons”⁵² of sugar production. With today’s the new technology, Cuba could become the new Saudi Arabia of sugar crop production for bio-ethanol. Unfortunately, this would not happen with the regime in power, and given the current state of Cuban agriculture industry after the “Special Period”. This special period led to unproductive fields due to the great labor absenteeism, scarcity of fundamental tools of labor, and a centralized bureaucracy. This is the reason why a rich country like Cuba is incapable of producing enough resources to feed its population and has to import basic foods at the current high prices.

Furthermore, not only could Cuba become a world bio-ethanol supplier, but also an oil supplier. Interestingly enough, in July 2004 the Spanish oil company Repsol-YPF, in partnership with Cuba’s state oil company (CUPET), discovered fields of oil in the North Cuba Basin – 20 miles north of Havana. According to the studies, this area is expected to provide from 4.6 to 9.3 billion barrels of crude oil, and from 9.8 to 21.8 trillion cubic feet of natural gas. This area was immediately divided into 59 exploration blocks ready to welcome foreign oil companies with offers of production-sharing agreements.⁵³ Some of the most important oil companies are the Spanish Repsol-YPF, India’s Oil and Natural Gas Corp (ONGC), and Norsk Hydro ASA of Norway who bid for the rights to some of the lots. However, Cuban authorities have pushed these plans back until 2009 due to “a setback in securing a rig on time to start drilling this year.”⁵⁴ To find oil in Cuba will be a blessing for this economically broken country, which is living off tourism and Hugo Chavez’s charity. With this amount of oil, Cuba would obtain the status of an oil producer’s country and would start receiving everyday billions of US dollar—a currency that is banned in Cuba—but money that the current regime could use to maintain the revolution. This future influx of money might be the key to explain Fidel Castro’s latest statements between aggressive and arrogant about the recent revision of the embargo by the EU.

Following these new discoveries off the Cuban coast, political moves by the US have followed. Jeff Flake and Larry Craig from the Republican side introduced two bills to the House of Representatives and Senate respectively that would exempt oil from the Cuban embargo. On the Democrat side, Florida’s Senator Bill Nelson, and Congressman Jim David countered with rival legislation. They proposed to deny US visas to executives of foreign oil firms which drill in Cuba water and they warn of the potential environmental risk of the drilling for the Florida Keys and the state’s tourism economy should there be any oil spill.⁵⁵ However, on June 17, 2008,

⁵¹ China Daily, “China Enlarges Bio-ethanol Fuel Coverage,” Chinadaily.com, April 1, 2008. http://www.chinadaily.com.cn/china/2008-04/01/content_6582660.htm (Accessed June 26, 2008)

⁵² The New York Times, “A Prosperous Year for Cuba,” December 3, 1892. http://query.nytimes.com/mem/archive-free/pdf?_r=1&res=9D07E3DF1731E033A25757C0A9649D94639ED7CF&oref=slogin (Accessed 19, 2008).

⁵³ Associated Press, “Cuban Oil Renews Embargo Debate,” *MSNBC. Com*, July 2006. <http://www.msnbc.msn.com/id/14095881/>

⁵⁴ LatAm Energy, “Repsol-YPF delays Cuba Exploration,” May 14, 2008. http://www.accessmylibrary.com/coms2/summary_0286-34546028_ITM (Accessed June 25, 2008)

⁵⁵ Laura Smith-Spark, “Cuba Oil Prospects Cloud US Horizon,” *BBC news*, September 2006, <http://news.bbc.co.uk/2/hi/americas/5321594.stm> (Accessed June 23, 2008)

Florida Governor C. Crist stated that he “now supports exploration drilling for oil and gas off Florida”⁵⁶ The Federal Minerals Management Service believes that oil can be found within the first 100 miles of Florida’s coast, and the National Petroleum Council estimates that the eastern Gulf could supply 36.7 trillion cubic feet of natural gas and 5.2 trillion barrels of oil.

It seems that an important oil well really exist in between both countries, if both countries decide to explore their oil wells, the embargo on Cuba might very soon have an extremely high economic price and lots of diplomatic disputes— similar to those dispute that started the war between Kuwait and Iraq in 1991.

The EU has just lifted the sanctions against Cuba without apparent reason. Curiously enough, this is the first time that lifting sanctions has disappointed both Cuban dissidents and Fidel Castro, who slammed the EU decision in one of his latest writings. He has declared in his webpage, *Cubadebate.com*,⁵⁷ that ‘at my age and in my state of health, you don't know how long one is going to live, but from now on I wish to register my contempt for the huge hypocrisy behind this decision.’⁵⁸ He explains that the EU should not criticize Cuba on dissident issues when the immigration policy of the EU is brutal against immigrants who are the result of decades of colonial, semi-colonial, and capitalist European exploitation.⁵⁹

Final Word

Nations worldwide are addicted to oil. Just when the high price is becoming impossible to pay and the availability of this scarce resource is doubtful governments are rushing to come up with a solution to the addiction. However, it is obvious that the withdrawal symptoms have not yet been overcome since governments are still looking for new oil fields.

This confirms the theory that oil is not just a source of energy but also a source of political power. Western democratic societies have known how to come up with breakthrough discoveries to stop dependency of a given source of energy and improve our living standard. Western democratic societies had moved from wood to coal energy to oil as a source of energy. With each change, new technology was developed to help free the world. Now, it is time to achieve independence from oil. The world cannot be held hostage by the most undemocratic countries, with cultures rooted in beliefs denying that man has set foot on the moon helped, most probably, with energy bought from them. Oil has become a source of energy so powerful that is making some countries maintain a soft *third war* with a hidden and active enemy.

Governments must realize that other alternatives must be found. For instance, just when miles of forest were being destroyed everyday to produce paper, the internet and the digital communication were invented. This new way of communication has done more to save the tropical forests in the Amazonia forest than any activist group. Now governments can no longer postpone finding, improving, and implementing new energy alternatives. As of today, bio-ethanol from sugar cane and nuclear energy are two safe and available sources of energy. If properly developed, bio-ethanol production does not pose a threat to the world food supply. In fact, most of the sugar factories that were first developed by Napoleon, and had to be dismantled to protect European quotas could return to service now. Also, nuclear energy is not going to be implemented by an obsolete country with obsolete techniques and obsolete management. Finally,

⁵⁶ Mary Ellen Klans, “Crist: I now Support Oil Drilling off Coast,” *The Miami Herald*, June 18, 2008. http://www.miamiherald.com/top_stories/story/573350.html (Accessed on June 26, 2008)

⁵⁷ Fidel Castro, ““Reflexiones del compañero Fidel: ESTADOS UNIDOS, EUROPA Y LOS DERECHOS HUMANOS,” *Cubadebate.com*, June 20, 2008.

http://www.cubadebate.cu/index.php?tpl=design/especiales.tpl.html&newsid_obj_id=11853

⁵⁸ “A mi edad y en mi estado de salud, uno no sabe qué tiempo va a vivir, pero desde ahora deseo consignar mi desprecio por la enorme hipocresía que encierra tal decisión”

⁵⁹ Los emigrantes son además fruto de la explotación colonial, semicolonial y capitalista

very little has been done to obtain energy from the biggest sources of free energy available to us: the wind, the sun, and the sea.

This is the time for strong global leadership with quality democracies to pursue and accomplish energy independence, and to free citizens from their fears, and the menaces of those, who use energy as a leverage to impose on us how we should live. Energy independence is a vital struggle that has to be won to maintain the prosperity of our countries and must not be stopped by the pressures of an energy source.