



The End of the Oil Age? Alternative Energy Options

“The Stone Age did not end for lack of stone, and the Oil Age will end long before the world runs out of oil” Sheikh Ahmed Zaki Yamani former Saudi Oil Minister & former Head of OPEC.

As oil prices soar and global warming heats up, the world looks toward finding alternative and renewable sources of energy. The United Nations Environment Program (UNEP) has themed this year’s World Environment Day “CO2 Kick the Habit! Towards a Low Carbon Economy”. Internationally the Kyoto Protocol has 141 industrialized nations signed on to reducing greenhouse gas emissions to 6% below their 1990 levels by 2012. Last December, President Bush signed the Energy Independence and Security Act (EISA) of 2007, but the US and Australia remain the only industrialized nations which have not signed on to the Kyoto Protocol.

The EISA legislation contains rigorous mandates and efficiencies, a few of which are to increase the use of renewable fuels by 500% by 2022, increase fuel efficiency by 40% by 2020, phase out the use of incandescent light bulbs by 2014, and the resolve that all new Federal buildings will be carbon-neutral by 2030.

Three decades after the Oil Crisis of 1973, our South American neighbor Brazil has successfully developed a cost-effective alternative to gasoline by producing ethanol from sugar cane. Today, they are the world’s second largest producer of ethanol and the largest exporters of this bio fuel.

This advancement in alternative energy in Brazil can be attributed to significant government support; billions of state funds went into research and development to get sugar companies and auto makers to deliver the cost-saving breakthroughs. Table 1 shows how the auto industry in Brazil has evolved in response to the development of ethanol.

Table 1 - Ethanol Car Manufacturing in Brazil 2003-2007

Ethanol Car Manufacturing in Brazil 2003-2007 (Selected years)			
Year	Flex fuel Cars Manufactured	Total Cars Manufactured	% Ethanol Cars
2003	39.853	1,361,361	4.8
2004	282.706	1,862,780	17,8
2005	776.164	2,011,817	40.7
2006	1.249.062	2.092,003	59.7
2007	1,716,716	2,388,402	71.9

Source: Brazilian Automakers Association (ANFAVEA), 2007 and 2008. [\[10\]\[11\]](#) Data shown for FFs does not include light commercial vehicles.

"Flexible fuel" cars running ethanol, gasoline or a mixture of both dominate the auto industry in Brazil. Car buyers do not worry about the rising price of either oil or ethanol as their flex-fuel cars allow them to hedge their bets at the pump. In 2007, 8 out of every 10 new cars sold in Brazil were flex-fuel.

Regionally, our Caricom partners have zoomed ahead of us with renewable energy initiatives such as the promotion of solar water heating systems in Barbados, where the Ministry of Finance granted concessions to manufacturers on import duties for solar panels and provided consumers with partial or full tax deductions for the cost of the heaters. The installation of 32,000 solar water heaters throughout the island has led to US\$16million in savings, assuming the alternate use of electricity at normal rates.

In Jamaica the government has a policy goal to reduce fossil fuel dependency by 15%, moving to renewable energy sources by the year 2020. Solar, hydro, ethanol, and wind alternatives are being pursued to this end.

In Guyana a US\$4billion hydro power project is underway on the Mazaruni River, the biggest renewable energy project in the Caribbean. Upon completion, this project could produce more than 11,000 megawatts of power and could supply Brazil, Trinidad, Haiti, Jamaica, the Dominican Republic and Puerto Rico on an Integrated Caribbean Grid.

The governments of St Lucia, Dominica, Belize, St. Vincent and St. Kitts all have renewable energy policies and policy proposals. So what is Trinidad and Tobago's policy on renewable / alternative energy? We have yet to develop one. Interestingly enough: solar, wind, hydro electricity and ethanol are all viable in Trinidad and Tobago. In particular, our latitudinal placement just 10.5 – 11 degrees north of the equator gives us constant supply of the sun's light and heat required for photovoltaic (PV) /solar power generation. While some might argue that solar power generation is expensive relative to fossil fuels, diminishing fuel reserves worldwide as compared to the sun's perpetuity makes a good case in favor of solar energy.

At their 33rd Annual Meeting last month (May 2008) in San Diego, the Institute of Electrical and Electronics Engineers (IEEE) PV specialists discussed the reduction in average global solar costs. They noted that:

“Global PV production has been increasing at a rate of 50% per year, so that accumulated global capacity doubles about every 18 months. The PV Moore’s law states that with every doubling of capacity, PV costs come down by 20 percent. In 2004, installing PV cost about \$7 per watt, compared to \$1/W for wind, which at that time was beginning to stand on its own feet commercially. Last year, average global solar costs had come down to between \$4 and \$5 per watt, right in line with the PV Moore’s law. “

While the implementation of infrastructure for solar power may seem very expensive, we have seen in the last year that Google Headquarters has started a project to install the equivalent of 4 acres of solar panels, which it expects to last for 20 to 25 years and which they expect to pay for themselves in energy savings within 5 to 10 years. Even the Vatican had started installing solar panels on the roof of the Paul IV Hall in 2007, with Pope Benedict declaring in an April 2007 address that we should "respect creation" while "focusing on the needs of sustainable development".

North East Trade Winds could be harnessed to produce wind energy, which is a much cheaper alternative with more developed technology. Mini hydro plants, like those developed in Jamaica to use river power, can also be developed here in Trinidad. Hydro electricity is the cleanest form of energy and while we may not have rivers and waterfalls to match Guyana and Niagara, technological advances in this area have made the mini hydro plants both economical and practical.

With the halt of the sugar industry in Trinidad, the ethanol alternative may not be viable for production in Trinidad. However, the opportunity cost of importing ethanol from Brazil to replace or significantly diversify our power generation, whilst simultaneously reaping the benefits of exporting our oil and natural gas may well be worth some serious consideration. If the Government of Trinidad and Tobago plans to reduce or remove the fuel subsidy altogether it would hold us in good stead to begin diversification of our energy consumption away from fossil fuels and towards renewable energy.

As with all things in life, moderation and diversification is the key, too much of one thing is never a good thing and it is not wise to keep all your eggs in one basket.

FINANCIAL & ECONOMIC INDICATORS

As at 5 June, 2008

<u>Exchange Rate/US\$</u>	<u>Closing Value</u>	<u>Previous Week</u>
Yen	105.94	104.69
Euro	1.56	1.56
Jamaica	71.57	71.43
Guyana	204.70	204.70

<u>Commodity Prices</u>	<u>Closing Value</u>	<u>Previous Week</u>
Crude oil (US\$/bbl)	127.79	131.03
Natural Gas (US\$/mmbtu)	12.49	11.59
Gold (US\$/Troy Ounce)	877.20	900.85

Eurobond Indices (Return % YTD, as of 5-June-08)

Lehman Brothers Global Aggregate Index	0.27
JP Morgan EMBI+ (percentage change)	-2.40
CMMB Eurobond Index	n/d

<u>Policy Interest Rates (%)</u>	<u>Closing Value</u>	<u>Previous Week</u>
United States	2.00	1.75
Euro Zone	4.00	4.00
Japan	0.51	0.51
Brazil	12.25	11.75
Trinidad	8.25	8.25
Jamaica	13.50	13.50
Barbados	4.50	4.50

<u>Market Interest Rates (%)</u>	<u>Closing Value</u>	<u>Previous Week</u>
US 90-day T-Bill	1.82	1.85
US 10-Yr Treasury	4.04	4.01
3-month UK Libor	5.86	5.86
Japan 90-day T-Bill	0.53	0.53
Brazil 90-day T-Bill	12.30	12.30
TT 90-day T-Bill	7.17	7.12
Jamaica 90-day T-Bill	13.92	13.92
Barbados 90-day T-Bill	4.31	4.51

Sources: Bloomberg, CMMB, Central Bank of Trinidad and Tobago, Bank of Jamaica, Central Bank of Barbados, www.lehman.com

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