



## Ethanol – benefits, risks and challenges By Marcos Jank

Since March 2008, ethanol consumption in Brazil has surpassed that of gasoline. For that reason, Brazil is the only country in the world where the "alternative" fuel is fossil and the "main" vehicle fuel is renewable. This is only possible because the 1975 oil crisis led Brazil to launch a bold petroleum substitution program. Brazil currently blends 25% of ethanol into all gasoline, flex-fuel vehicles represent over 90% of new car sales, 37% of the total light vehicle fleet is flex and ethanol is available in service stations throughout the country.

Recent studies offer impressive data about the cane industry's impact on the country. Ethanol production alone creates 465,000 direct jobs, a number six times larger than the oil industry in Brazil. Ethanol is present in 1,042 cities, compared to only 176 oil-producing municipalities. This translates into more income distribution and internal development for these communities. University of São Paulo (USP) scholars estimated that a 15% nationwide gasoline substitution with ethanol creates 118,000 new jobs, generating R\$ 236 million (US\$ 140 million) in additional wages annually.

As for the environment, the use of sugarcane ethanol has generated a reduction of 600 million tons in CO2 emissions since 1975, an amount equivalent to the carbon sequestered with the planting of 2 billion trees according to a recent peer-reviewed study. In economic terms, specialists conclude that for every liter of ethanol, the country saves US\$ 0,20 in carbon mitigation costs. Air Quality researchers at the University of São Paulo (USP) School of Medicine estimate that if every car in the Sao Paulo metropolitan region were fueled exclusively with gasoline, the city would face annually more than 400 additional deaths, 25,000 hospitalizations and an increase of R\$140 million in healthcare expenses.

The 1990s sugarcane market liberalization is one of the reasons for the industry's current positive performance. The elimination of price and production controls, previously carried out by the now defunct Institute of Sugar and Alcohol (IAA), led to significant improvements in productivity and real price reductions for both sugar and ethanol. Furthermore, petroleum is not only highly pollutant but as it become increasingly scarce in the world, its cost will only increase.

One consequence of deregulation is the significant increase in price volatility, both seasonally (harvest and between harvests) and cyclically (over the years). Unlike gasoline and diesel, where prices are artificially set in Brazil by the state-owned monopoly Petrobras, sugar, ethanol and cane prices vary according to the laws of supply and demand. Brazilian ethanol is similar to petroleum in the global market, because both are subject to market conditions. To exemplify, in the past two years Brazil underwent cycles of extremely depressed ethanol prices because of a strong increase in supply, the result of aggressive investments in expansion and new mills. Low prices reduced the cane industry's profits. However, between 2005 and 2008, this price reduction and the expansion of the flex-fuel fleet led to a 185% increase in the use of hydrated ethanol. During the same period gasoline consumption increased by only 7%.





In March of this year, sugar and ethanol executives met with government officials on several occasions to discuss ways to stockpile the product, considering the beginning of a new record harvest and, at the time, a drop in prices due to the global economic crisis that affected producers. With the majority of the companies' budgets constrained because of the crisis, the warehousing program did not reach the expected result. Seven months later, as the same harvest period draws to an end, excessive rainfall has damaged overall output and that led the Brazilian government to consider reducing the amount of ethanol blended into gasoline, from 25% to 20%. In other words, a radical change of scenario and policies within the same harvest took place.

The industry reacted well to market stimulus and demands, rapidly increasing production and its economic and operational efficiency to meet growing demand. With the exception of this year's excessive rainfall until December, there is no reason to change ethanol blend levels at this time. The days of cars fueled only with ethanol and, therefore, more vulnerable to supply shortages are long gone. Nowadays, cars are "flexible" and ethanol competes directly with gasoline for the consumers at the pump. In other words, market adjustments happen naturally, at fueling station, where consumers can now decide in terms of relative prices and built-in values of each fuel, such as power, consumption, environmental impacts and effects on public health.

We are all aware that both consumers and producers would like to see less price fluctuation for ethanol. Yet ethanol is an agricultural commodity, highly influenced by weather, which must be produced during seven months and marketed during the entire year. Unlike the sugar market, the rigidity of ethanol trading rules make it difficult for the development of trade agents, as it generates little liquidity and is characterized by huge volatility in a primitive market that functions strictly based on daily spot prices. That's the reason why the sector insists on the necessity of new physical and future trading tools that generate more liquidity and risk management, with the inclusion of new agents. It is also necessary to develop tax policies that consider positive social and environmental externalities that ethanol brings to society, keeping in mind that it also represents one of the great innovations developed by Brazilians.

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