GLOBAL WARMING

A LATIN AMERICAN PERSPECTIVE

Global warming is a reality. Innovation in energy technology and policy are sorely needed to cope. The OECD countries representing the largest economies of the planet emit half of the total greenhouse gases (GHG), but have shown remarkable passivity when it comes to an energy policy that deals with climate change. They will have to assume the leadership role that they have so far largely shirked.

We believe that with current proven technologies and international political will we could reduce net emission of GHG in the next years. Several technologies are available and proven, what we lack is the political will to agree on international standards, and there is no time to lose.

We mustn't forget that our stock of non-renewable resources will eventually end. Several authors have shown that oil net reserves are decreasing and no new significant finds are foreseen and the total world reserve natural gas curve will reach a peak in the next decade or so. We are, therefore, faced with the impending necessity to, ever so quickly, implement the use of all these technologies. Replacing fossil fuels may bring the added benefit of a de-escalation of international political tensions and hotspots.

Latin America is the region with the largest potential to generate and offer to the world clean renewable energy with present technology. It is rich in natural gas and hydroelectric potential and it is the largest producer of bio-ethanol in the world. South America in particular has one of the largest native tropical forest areas in the world, making the region an especially important player in any global carbon capture strategy.

The Latin American private sector believes that any international policy regarding the emission of GHG should take these facts into account and should insure the possibility of future economic progress of our nations. While our region contributes only somewhat more than 4% to world wide CO_2 emission, it is doing its part to the decrease it.

Nine countries in South America have developed pertinent legislation and technology for the use of natural gas in the generation of electricity, but more significantly to replace gasoline partially or totally in vehicles. Their aggressive programs have so far converted almost 3.5 million vehicles to CNG, with Argentina and Brazil representing more than 90% of this total. The benefit to the consumer and the environment is unquestionably important: an energy unit of CNG costs about half its gasoline equivalent and studies show that for CNG, GHG emissions are reduced 99% for CO, 20% for CO_2 and 58% for hydrocarbons.

Similarly, al least 10 countries in Latin America have appropriate legislation and are producing bio-ethanol to add to or replace gasoline entirely. Brazil is by far the largest producer of bio-ethanol and lieder in the conversion of vehicles to the partial or total use of bio-ethanol. Today all gasoline sold in this country is mixed with at least 25% ethanol.

The negative impact of two oil crises in 1973 and 1978 on the Brazilian economy caused the establishment of the National Alcohol Program, which offered important incentives to the industry. As a result production grew from 555 million liters in 1975/76 to 20 billon liters in 2006/07. Of this production 3 billion liters are presently exported.

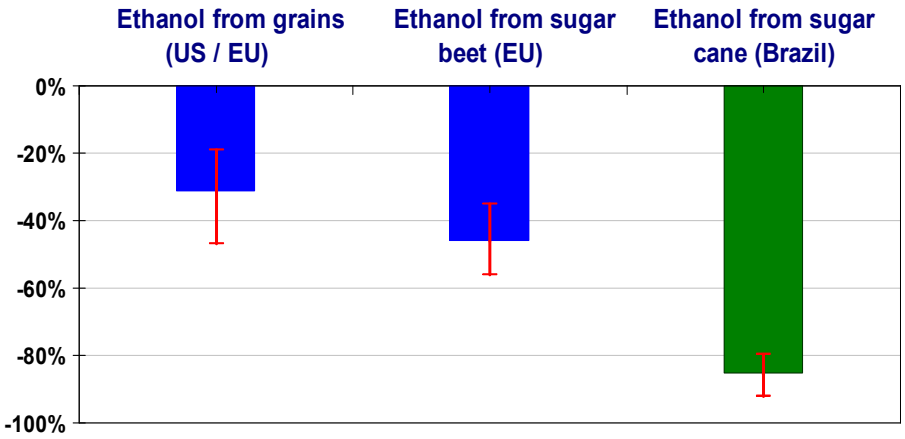
Of Brazil's total territory of 850 million ha, 150 million ha are adequate for agriculture without deforestation. Of these only 62 million ha are planted today and sugar cane takes up only 6.5 million ha, 10% of utilized land or 4% of potential agricultural land. Projections to 2020 predict an area of only 13.9 million ha for sugar cane production, proof that there is no displacement of food crops today or in the foreseeable future, even including export demand.

For instance, the United States Energy Bill forecasts 36 billion gallons of fuel by 2022, equivalent to 136 billion liters of ethanol, and the European Union proposes in a new Energy Policy for Europe a 10% share of biofuels in gasoline and diesel by 2020, equivalent to 14 billion liters of ethanol. The production of this total volume of ethanol would require 22 million ha or only 14.6% of current Brazilian arable land.

The benefits of replacing gasoline with sugar cane alcohol are multiple. GHG emission reduction for sugar cane ethanol compares very favorably (90%) with beat ethanol (50%) and grain ethanol (30%). Reductions are calculated in well-to-wheel GHG emissions per km basis.

GHG BALANCE ON A LIFE-CYCLE BASIS

Emissions **avoided** with ethanol replacing gasoline



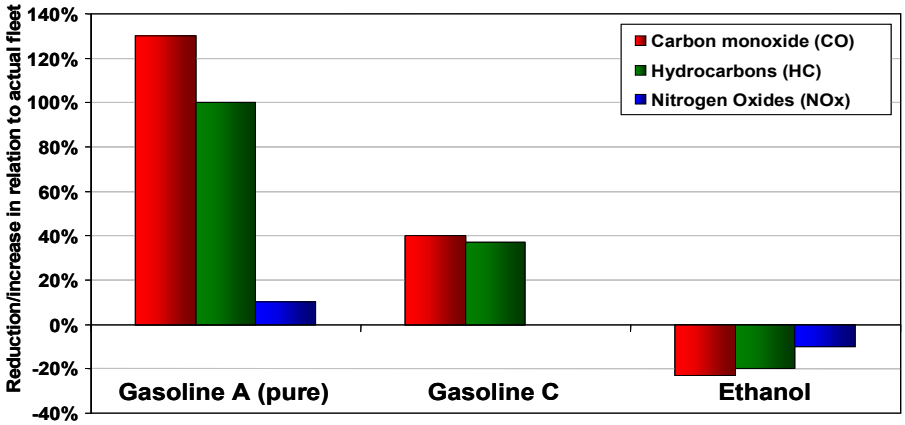
Note: Reductions in well-to-wheel CO_2-equivalent GHG emissions per km, from bioethanol compared to gasoline,calculated on a life-cycle bais. Sourse: International Energy Agency (May, 2004), base on a review of recent articles. Elaboration: Icone and Unica.

The emissions of the principal fuel contaminants: Carbon Monoxide, Hydrocarbons and Nitrogen Oxides are also significantly reduced when the pure ethanol is compared with gasoline-ethanol mixtures and pure gasoline as is shown in a study of these scenarios in the Sao Paulo area.

ATMOSPHERIC POLLUTION SCENARIOS

SÃO PAULO METROPOLITAN AREA

Reduction/increase in relation to real fleet, in case all vehicles use exclusively gasoline A, gasoline C or ethanol (3 scenarios)

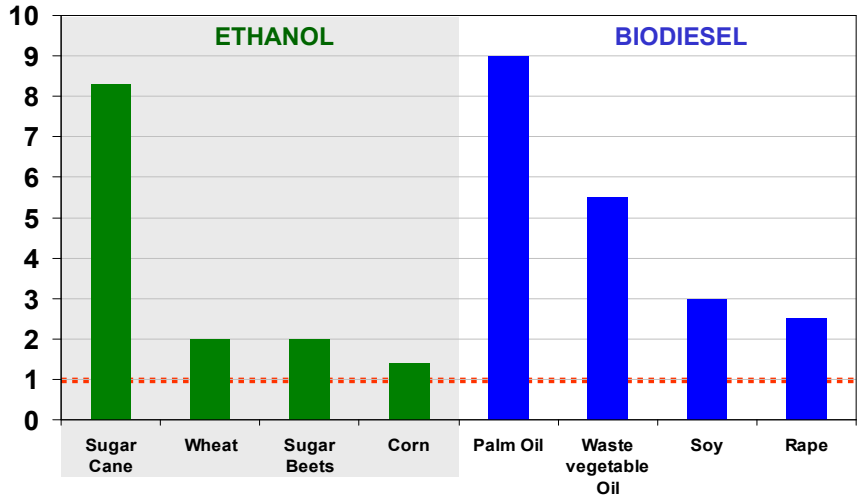


Source: Confederação Nacional da Indústria de Veículos Automotores, 1990 (Association of Automovile Manufacturers) Szwarc, A. Impacts of the use of ethanol on vehicle emissions in urban areas. In: Macedo, I.de C. (org). Sugar Cane's Energy, São Paulo. 2005.

The bio-fuel production net energy balance is an important factor when comparing crop source. That is how much energy is contained in a unit of bio-fuel for each unit of fossil energy used to produce it. The figures are dramatic: sugar cane alcohol 8.2 times while corn ethanol 1.4

FOSSIL ENERGY BALANCE (estimate)

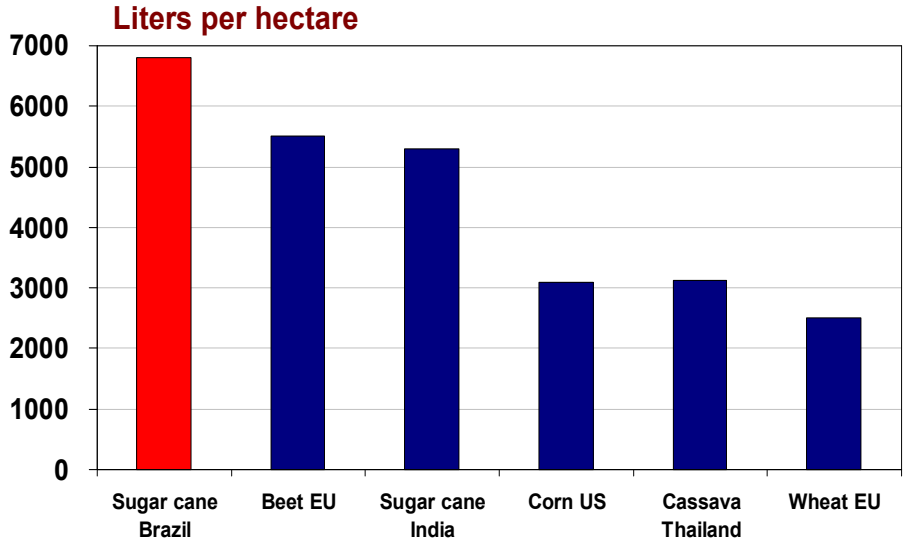
Data represent the amount of energy contained in the listed fuel per unit of fossil fuel input



Source: Various, compiled by World Watch Institute. Elaboration: Icone and Unica

Productivity figures in liter per hectare of bio-ethanol from different crops also favors sugar cane with almost 7000 lit/ha compared with corn at over 3000 lit/ha. Accordingly, production costs are also unfavorable for corn ethanol, 1.09 $/gallon vs. 0.87$/gallon for sugar cane ethanol.

ETHANOL YIELDS



Source: IEA – International Energy Agency (2005) and MTEC. Elaboration: ICONE and UNICA.

We must understand that global warming is a systemic problem which requires global solutions. Unfortunately, many countries are treating the problem unilaterally and in isolation concentrating their efforts in the production of bio-ethanol from very low efficiency raw materials. Corn, colza, beets, etc are noble commodities with strategic importance in the production of meat, dairy products and vegetable oils and should not be used in the production of bio fuels.

In a recent report the Swiss sociologist Jean Ziegler, UN Special Rapporteur on the Right to Food, asserts that the 4% increase in the price of corn in 2007 compared to 3% in 2006 is due, at least in part, to the production of corn ethanol. This impact on emerging economies could be as high as 9%. And more expensive corn means higher prices in the food chain which has corn as its base.

So, the opposition of certain political leaders in our region, or elsewhere in the world, to the production of bio-fuels on the grounds that they displace badly needed areas for food crops and raises their prices, is not applicable to sugar cane ethanol.

It is possible to produce both bio-energy and food. Hunger in the planet is not caused by lack of food but rather by lack of income. It is important to use the adequate crops to produce bio-fuels. Additionally the development of technology necessary to produce ethanol from cellulose, could duplicate the production of ethanol per ha, lessening the pressure to increase cultivated area. However, it seems that any option used in temperate zone countries will always be more costly and less efficient than the possible alternatives in the tropical areas of the world.

In conclusions, we believe that a much needed global strategy and standards should have the flexibility to include all tried and experimental technologies to decrease pollutants, optimizing their use according to the particular circumstances of each country or region. In the meantime a change of our

energy matrix towards the use of renewable energy sources is paramount. Unfortunately efforts in this direction on a worldwide basis have been insufficient and isolated.

Jeffrey Sachs, Director of the Earth Institute at Columbia University writes in a recent article on the Peace Prize: “The world must react in three aspects: First, we must take seriously the need for a new agreement on climatic change when the world negotiations start in Bali next December. The Kyoto Protocol expires in 2012 and the world needs a much more solid frame with the clear objective of stabilizing the effects of GHG all the way to 2050”.

“Second, we must start scientific structures to deal with other global challenges such as the loss of biodiversity, desertification and over fishing of the oceans…”

“Lastly, we must modernize our Governments so they create institutions similar to the Intergovernmental Panel on Climate Change (IPCC) of the UN…The IPCC has demonstrated that science can make an essential contribution to this fight and that scientists and politicians can work together to solve problems that are of crucial importance for mankind”

Fernando Illanes
International President
CEAL