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IN COLOMBIA, BLOSSOMING BIOFUEL INDUSTRY DRIVEN BY TOP-DOWN TARGETS AND INCENTIVES

By Benjamin Witte-Lebhar

In the span of just a few short years, Colombia--already a major oil and coal producer--has developed an entirely different energy industry: biofuels. The industry's pedal-to-the-metal production surge has attracted no shortage of admirers, who hail the biofuel bonanza as a model worth emulating. Others, however, question the social, economic, and even environmental implications of harvesting fuel from the country's fertile fields.

A decade ago, Colombia had no biofuel industry, nor was it apparent to many outside observers that it needed one. The region's fourth-leading oil producer after Mexico, Venezuela, and Brazil, Colombia also sits on major coal reserves. It is not, in other words, an energy-poor country desperate for alternatives.

Yet in 2001, then President Alvaro Uribe passed a forward-looking law stipulating that, by 2006, gasoline consumed in Colombia must contain 10% ethanol. At the time, Colombia did not produce ethanol, an alcohol fuel additive made from crops. But it did grow plenty of sugarcane, from which Brazil, South America's biofuel pioneer, has been producing ethanol since the 1970s. The world's leading ethanol producer, the US, uses corn as its primary feedstock.

Eager to capitalize of this comparative advantage, the Uribe government also saw ethanol production as a way to spur rural economic development and create sustainable new jobs. Energy security may have been a motivation as well. By mandating consumption of ethanol, a renewable product in that cane fields can be planted and harvested over and over again, the government is trying to ratchet down conventional oil consumption and thus protect its finite petroleum reserves.

Backers of Colombia's pro-ethanol policies are also quick to cite the biofuel's environmental advantages. Ethanol burns much cleaner than conventional gasoline. In addition, cane- and cornfields absorb CO₂. By turning to ethanol, Colombia is reducing its carbon footprint on two fronts, argue biofuel advocates.

A top-down approach

Whatever the reasons, Colombian ethanol production began in earnest in 2005, the year before Uribe's 10% target was set to take effect. Since then, production has increased substantially. Between 2005 and 2007, ethanol production--concentrated mostly in the Cauca Valley--rose from zero to nearly 74 million gallons per year, the Asociación de Cultivadores de Caña de Azúcar (ASOCAÑA) reported. By 2009 it had reached 85 million gallons.

Production dipped a bit last year because of El Niño-related flooding but is expected to continue expanding in the years to come. Hart Energy, a US consulting firm, said Colombia could double ethanol production by 2015 and triple it by 2020.

The same goes for the country's other rapidly growing biofuel: palm-based biodiesel. Hart Energy predicts that, by 2015, Colombian biodiesel production (currently 195 million gallons per year) could reach 365 million gallons. By 2020, it could pass the 400 million gallon mark.

Still, compared to biofuel giants like the US and Brazil, Colombia's nascent industry remains quite modest. Colombia is now South America's second-leading ethanol producer after Brazil yet as of 2009 accounted for just 0.4% of global production, according to the UN's Economic Commission for Latin America and the Caribbean (ECLAC). Brazil, in contrast, produces nearly 34% of the world's ethanol. The US, the industry leader, produces close to 54%.

The same goes for biodiesel, nearly 60% of which is produced in Europe. The US produces roughly 10% of the world's biodiesel, while Brazil and Argentina produce 8.4% and 7.6%, respectively. Colombia, despite being the top palm-oil producer in the Americas, contributes just 1.2% to the global biodiesel pie.

But on a local level, industry players and their government backers hail Colombia's biofuel experiment as a major success story. Authorities have followed Uribe's original 2001 ethanol decree with other target laws, mandating, for example, that all the country's diesel be mixed with 5% biofuel. Combined with other generous incentives such as tax breaks and price guarantees, the target laws seem to be working. Colombian vehicles are using more and more biofuels (gasoline has now reached a national average of between 7% and 8% ethanol), and the industry, to keep up with growing demand, is expanding.

The government plans to gradually raise the consumption targets over time. It is also pushing for a law to require that 60% of new cars (with engines smaller than 2.0 liters) have "flex-fuel" engines capable of running on gasoline blended with up to 85% ethanol.

A long-pending free-trade agreement (FTA) with the US--assuming it is eventually approved by the US Congress--could give Colombian biofuel producers yet another incentive to boost production.

The industry is already attracting new foreign investors, such as London-based ED&F Man and Ampal-American Israel Corp., which in turn are helping generate new jobs. Already the ethanol industry employs nearly 90,000 people, Colombia's Agriculture Minister Andrés Fernández Acosta explained in a 2009 interview with Reuters. "Our goal," he said, "is to generate employment and pursue a policy that is friendly to the environment."

US government officials have also heaped praise on the growing industry. A 2009 US Department of Agriculture (USDA) report offers a glowing assessment of Colombia's foray into biofuels, noting that the country's ethanol factories are both clean and efficient. Thanks to technology imported from India, Colombian ethanol factories generate between 1 and 2 liters of vinasse (a byproduct) per liter of ethanol. In Brazil the vinasse-ethanol rate is 15-1.

Furthermore, most of the country's ethanol factories are energy self-sufficient: they use bagasse (another sugarcane byproduct) to generate electricity. The mills generate approximately 15 megawatts of surplus electricity, which they sell to the national grid. The USDA report says the industry could eventually generate up to 230 MW of bagasse-based electricity, a figure equivalent to 2.5% of Colombia's total installed capacity.

"The sugar-ethanol industry is becoming increasingly important to Colombia's economic and social development," the report reads. "The industry provides thousands of jobs, is a source of

significant government revenues for the municipalities in the Cauca Valley, and supports social programs aimed at improving people's well-being."

Questioning the costs

Not everyone, however, shares the USDA's enthusiasm for the experimental industry. Missing from this rosy picture, say some observers, is a more-nuanced assessment of the economic, social, and environmental costs associated with agriculture-based fuel sources.

For starters, say critics, the economic benefits of Colombia's biofuel industry tend to be overstated. With the exception of some recent foreign arrivals, the industry is dominated by a handful of companies that had already made their fortunes in sugar and palm-oil production. For them, the government's pro-biofuel policies simply sweeten the pot--by offering huge tax breaks and a guaranteed market for their products.

It's not clear, say critics, how much of that windfall trickles down to the general population. No doubt the industry expansion has created jobs, but not all of those jobs are likely to spur sustained rural development, as the government promises. Sugarcane cutters, for example, continue to work in dangerous, backbreaking conditions for as little as US\$10 per day.

A related question is just how much the industry costs the national treasury in lost tax revenue. Do the supposed benefits of the push for biofuels justify these hefty government subsidies?

The biofuel industry also has its share of environmental critics, who argue that ethanol and biofuel are not nearly as "clean" as advertised. Biofuels may burn cleaner in people's gas tanks than traditional gasoline. But those CO₂ comparisons don't take into account the emissions generated throughout the entire biofuel-production process, from farm to factory. Another problem is pollution from pesticides and fertilizers, used by the truckload to keep sugar and palm-oil plantations operating.

Perhaps the biggest sticking point for Colombia's biofuels push involves land use. The only way for ethanol and biodiesel makers to increase production is to grow more feedstock, which means occupying more land.

Colombia's Federación Nacional de Biocombustibles says palm-oil plantations covered more than 400,000 hectares in 2010, up from approximately 337,000 ha in 2008. During the same three-year period, the number of planted hectares of sugarcane rose from nearly 206,000 to 218,000. If biofuel production is going to double or triple in the coming years, so too will the area of land planted with the corresponding feedstock. The question, though, is where--and how--ethanol and biodiesel producers acquire that land.

Environmentalists worry that some of that land could be carved out of the Colombian rain forest. Another potential problem is that new sugar and palm-oil plantations will occupy land that would otherwise be used to grow foodstuffs. That, say critics, would not only mean less food for hungry Colombians but would also inflate food prices--a problem whose costs again fall heaviest on the poor.

The third major concern is that, in acquiring more land, biofuel producers--either legally or forcibly--will displace people already living and working there. Examples of forced displacement already abound, usually affecting rural campesinos, indigenous people, and Afro-Colombians.

Human rights groups such as the Inter-Church Justice and Peace Commission (ICJPC) report that in the palm-oil-growing northwestern Chocó region, thousands of mostly Afro-Colombian rural residents have been forced off the land in the past decade.

The ICJPC highlights one case, in February 2007, when Colombian soldiers and paramilitary fighters launched an attack in the region, supposedly to root out guerrillas from the Fuerzas Armadas Revolucionarias de Colombia (FARC). The operations resulted in more than 100 deaths and forced some 4,000 villagers to flee. In their absence, palm-oil companies occupied the land and established plantations. "There never was a combat. There was no guerilla," the ICJPC reported.

The Chocó saga and stories like it raise serious questions about government claims that land needed to vastly expand ethanol and biodiesel production has already been secured by security forces. Agriculture Minister Fernández Acosta made just such a claim during a 2009 meeting in London with investors from the ED&F Man company, saying the state has already recovered 6.5 million ha--available for use both by the biofuel and forestry industries.

"He continued to say that the security of the area was guaranteed by the Colombian government and that the land could be utilized without compromising ecologically sensitive areas like National Parks and rainforests and that the land is largely comprised of plains and grasslands," reads ED&F Man's May 27, 2009, meeting report.

The ICJPC and other rights group insist that in rural Colombia--where rural peasants must deal not only with state security forces but also paramilitary groups, drug traffickers, guerrillas, and, of course, industrial farm interests--the question of land ownership is far more complicated than the government is letting on.

"Colombia is mentioned in dramatic terms in most of the recent literature dealing with the social impacts of biofuels, and Jean Ziegler--the former UN Special Rapporteur on the right to food--included the advance of palm-oil cultivation for biodiesel in Colombia as a case of special concern in two of his reports," researchers from Holland's University of Twente wrote in the recent study *Biofuels and Land Appropriation in Colombia*.

"Displacement, land dispossession, and violent appropriation or misappropriation of land have been at the core of the controversy," the study's authors--Victoria Marin, Jon Lovett, and Joy Clancy--went on to say.