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## Event Report

# 2009 Energy Symposium Panel: “Unconventional Oil & Gas, Deepwater Exploration”

MARCH 27, 2009

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*On March 27, 2009, the Energy Club of Columbia Business School and the Energy Association of Columbia’s School of International and Public Affairs hosted the 2009 Energy Symposium, “Imagining Tomorrow: Meeting Energy Demands in a Carbon-Constrained World.” This year’s conference included the panel “Unconventional Oil & Gas, Deepwater Exploration.” This panel explored the role unconventional oil can play in enhancing energy security in an increasingly carbon-sensitive world. In this discussion, Ted Helms, global head of investor relations at Petrobras, highlighted Brazil not only as an emerging leader in the unconventional oil industry but also as an example of a company with a global energy policy.*

Ted Helms of Petrobras asserted that while deepwater exploration is unconventional for most companies most companies, it is conventional for Petrobras. Approximately 90 percent of the Brazilian energy company’s production is offshore, and Petrobras accounts for nearly one-quarter of the world’s production of deepwater oil. This form of oil exploration is difficult not only because of the vast water depths but also because of the challenges in breaking stubborn rocks with low permeability as well as in extracting viscous heavy oil.

In a world where access to conventional oil, such as that typically found onshore, is disappearing, the future of energy hinges on the success of companies like Petrobras. In the last five years, Petrobras has grown at a compound annual growth rate of approximately 5 percent; the major oil companies, in contrast, have largely experienced virtually no growth during the same period. While the push for more renewable sources of energy is stronger than ever, oil is still the most efficient energy resource, and its importance will not diminish any time soon.

Although plenty of oil exists below the Earth’s surface, accessing this oil remains the industry’s most significant challenge.

As Mr. Helms asserted, Petrobras is uniquely positioned because its “backyard” of Brazil happens to be an abundant source of oil that has been largely untapped. Petrobras held a monopoly on Brazil’s oil industry until 1997. In the early 1990s, the company produced 800–900 thousand barrels per day, selling at \$15–\$18 a barrel. Thus, the company had neither the capital nor the incentive to develop the technologies that would allow increased exploration in deepwater. The breakup of Petrobras’s monopoly, coupled with soaring oil prices, facilitated the company’s emergence as leading deepwater player.

In the past two years, Brazil has made some of the biggest oil discoveries of this century. These finds are in the Santos basin, 200 miles off the coast of Rio de Janeiro. Brazil claimed its first discovery, the Tupi oil field, in November 2007. At the time, Tupi was the largest-ever deepwater oilfield discovery. Although it is difficult to accurately measure the extent of the potential reserves, Mr. Helms said that these finds reflect at least 14 billion barrels of reserves, which would double Brazil’s current reserves and service another 20 years of the country’s energy consumption.

While the potential quantity of oil underlying these fields is indeed vast, access remains an enduring obstacle. In addition to having to descend the one to two miles between the ocean’s surface and floor, another three miles of vertical and lateral drilling is necessary. One mile of this drilling consists of a layer of salt with technologically challenging characteristics. Mr. Helms used a familiar image to put such a challenge in perspective: “It’s the equivalent of starting from the top of the Empire State Building and drilling to find a manhole cover in Times Square.”

Mr. Helms also emphasized that unconventional oil by itself will not solve the world’s energy problems. By 2020, the world will consume 90 million barrels a day. Based on current reserve-decline rates, 50 to 55 million barrels per day will need to be replaced. Oil from the newly discovered pre-salt-layer areas is expected to grow to 1.8 million barrels a day, but Brazilian consumption could increase by 1 million barrels a day, netting just 800 thousand barrels a day for the rest of the world. Considering that 50 to 55 million barrels more a day will be needed to fill the consumption gap, it is clear that even such historic finds as Brazil’s are insufficient to meet the world’s growing energy needs.

The insufficiency of oil, whether conventional or unconventional, leads the discussion to renewable energy. Despite Petrobras’s dominance in deepwater oil, as much as 50 percent

Brazil’s domestic energy production is in renewable energies (compared to just 10 percent in the United States), largely because some 90 percent of its electric power is hydroelectric. Brazil has also developed an infrastructure that facilitates the dominance of another renewable resource: ethanol. Approximately 95 percent of new vehicles in Brazil are E100 (100 percent ethanol fuel)-capable, while 100 percent of all gas stations are E100-compliant. As a result, this year more ethanol will be consumed than gasoline.

Brazil’s remarkable self-sufficiency originates from a government infrastructure that poses deterrents to energy consumption, particularly with respect to gasoline. Higher gasoline excise taxes give ethanol more attractive economics. So, while Brazil consumes just 300 thousand barrels of oil a day, the United States consumes 9 million—30 times more gasoline than Brazil, while it has just 1.5 times Brazil’s total population.

In addition to relatively low consumption, Brazil has expanded its energy-production capabilities to drive energy self-sufficiency. Accessing deepwater oil and investing in technologies to increase efficiency strengthens Brazil’s ability to meet its domestic-energy needs. Furthermore, a commitment to renewable-energy resources, particularly ethanol, allows Brazil to garner increasing success in attaining energy self-sufficiency.

Brazil’s success originates from two main factors: first, a long-term policy that harmonizes all available energy resources and, second, a public that is educated in energy issues because it effectively pays for energy initiatives through consumption taxes. Mr. Helms argued that a favorable energy outlook could be achieved by individual countries, and perhaps on a global scale as well, by looking to the Brazilian example.

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