

**CCSF Lunch Summary**  
**South America: Blueprint for a Green Continent**  
**17 September 2008**

**Attendees**

- David Lee
- Bob Howarth
- Susan Riha
- Rick Allmendinger
- Bob Blake
- Johannes Lehmann
- Terry Jordan
- Jeff Tester
- David Dieterich
- Sid Leibovich
- Chris Barrett
- Helene Schember

**Introduction**

On September 17, 2008, the Cornell Center for a Sustainable Future hosted a topical luncheon on energy, climate, and water impacts in South America. The luncheon was organized by Rick Allmendinger (EAS) at the suggestion of Chris Barrett (AEM) following a meeting of CCSF senior administrators with Engineering College deans. As with all CCSF luncheons, the idea was to bring together people across campus with diverse interests and expertise.

The luncheon started with a brief statement from Chris Barrett followed by self introductions from around the table. A research statement from Natalie Mahowald (EAS) and Peter Hess (BEE) who were interested in attending but could not because of conflicts was distributed, as were brief summaries of experience in South America by Johannes Lehmann (SC) and Rick Allmendinger. Rick Allmendinger then gave a brief introduction to South America energy use and challenges; the figures he showed are attached at the end of this report.

## Discussion

Much of the discussion<sup>1</sup> focused on the need to find a suitable “hot topic” about which to rally a large, continental scale project. South America has seen considerable private sector development in the last decade or two such that there is a relative lack of interest by international funding agencies (development banks, etc.) in investing in broad sweeping projects as opposed to “one-off” projects addressing very specific issues. Additionally, several South American countries have strong indigenous scientific communities.

There seemed to be general agreement that fresh water and climate change afforded the best possible “rallying point” for any future Cornell efforts in this arena. The reasons for this are:

- The unusually high dependence of South American on hydroelectric power. Continent wide, about 25% of the total energy consumed comes from hydropower (see appendix). Worldwide, dependence on hydropower is only about 5% of total energy production.
- The additional demands to be placed on the fresh water supply with the booming biofuels industry. Currently, continent wide, well under 5% of the total energy produced comes from ethanol (see figures at the end)<sup>2</sup>.
- Water quality is, increasingly, becoming an issue with toxic algae blooms in reservoirs becoming for frequent.
- The impact that climate change is likely to have on fresh water resources.

There was less enthusiasm in the room for other green sources of energy (wind, solar, geothermal); these energy sources are certainly regarded as

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<sup>1</sup> My apologies to fellow attendees for the lack of attribution of specific ideas to specific attendees!

<sup>2</sup> Bob Howarth reported after the meeting: “I just heard a presentation earlier today on ethanol in Brazil by Luiz Martinelli (part of our SCOPE biofuels workshop in Germany this week). According to Luiz, sugar cane provided 17.9% of the total energy use in Brazil in 2008, with 4.3% of that from ethanol and 13.6% from the combustion of bagasse. Note that this is a 28% increase in ethanol use compared to 2007.”

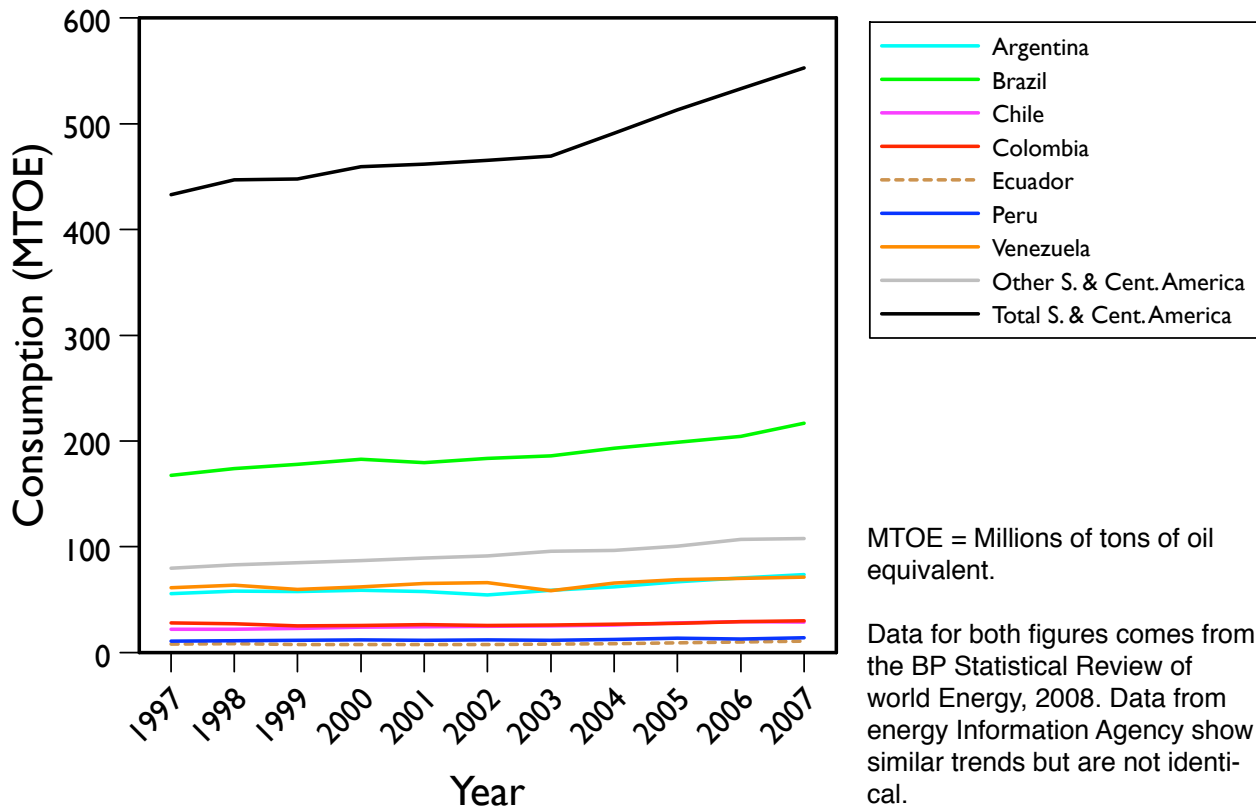
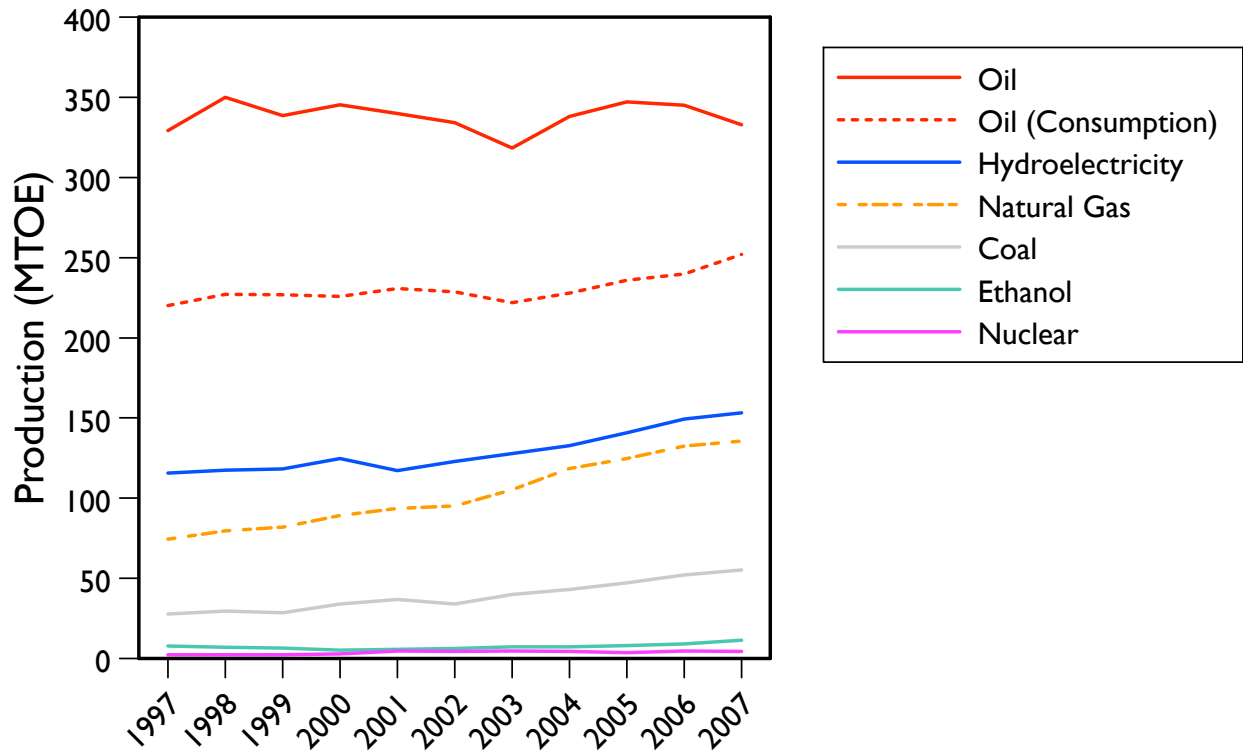
meritorious and worthy of study, but it is less clear how to craft **and fund** an overarching project to evaluate them. It may be better to try a country by country approach, especially since the countries with these resource are largely Andean countries which lack the huge economy of Brazil, the hydrocarbon resources of Venezuela and Brazil, or the biofuels industry of Brazil.

Potential funding sources mentioned during the meeting include the Inter-American Development Bank (IADB), USAID, and European reinsurers.

### **Followup**

The most concrete suggestion for followup was to invite **Jose Goldenberg**, Professor at the University of São Paulo and the former Secretary of State for the environment with the state of São Paulo Brazil, to visit Cornell. The CCSF might invite him directly or one might consider the possibility of an AD White Professorship. Susan Riha, Bob Howarth, and Jeff Tester all stated that they knew, or knew of him, in some capacity.

## Appendix: Figures shown during lunch



MTOE = Millions of tons of oil equivalent.

Data for both figures comes from the BP Statistical Review of world Energy, 2008. Data from energy Information Agency show similar trends but are not identical.

## Historical & Cultural Factors

- European vs. Native American (especially in Andean regions)
- War of the Pacific (1879-1880 — Bolivia, Perú, Chile)
- Rigid class structure; large economic disparities
- Current political panorama:

### Socialist

Venezuela  
Bolivia  
Ecuador

### Moderate

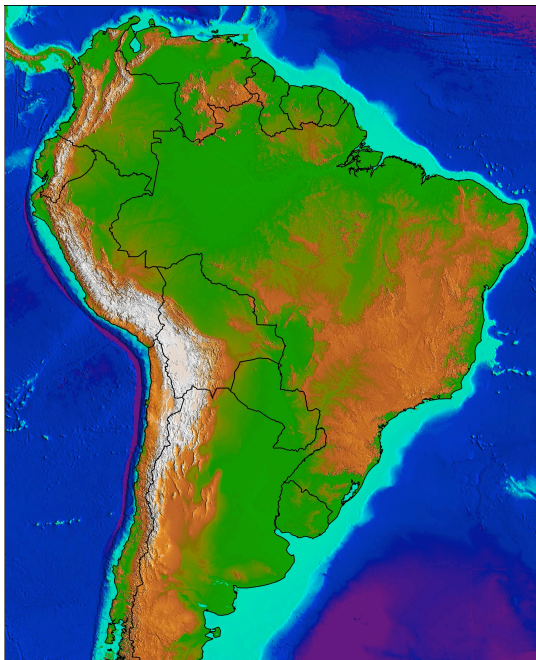
Argentina

Brazil  
Chile  
Peru

### Conservative

Colombia  
Paraguay

*disclaimer: a list from an uneducated observer!*



*Areas with green energy potential tend to be those not favored with traditional hydrocarbons*

## Green Energy Potential

- Geothermal (5000 km long Andean volcanic arc)
- Wind (Altiplano, Patagonia, Coastal Areas)
- Solar (Atacama Desert, Altiplano)
- Hydropower (Brazil, Andean countries)
- Tidal & wave energy
- ¿Biofuels? (Brazil today, widespread potential)

## Climate Change Impacts

- Current South American energy consumption contributes minimally to global carbon footprint
- Fresh water (with respect to energy)
  - Hydroelectric
  - Biofuels
  - Other agriculture and drinking water
- Amazon jungle as a global carbon sink