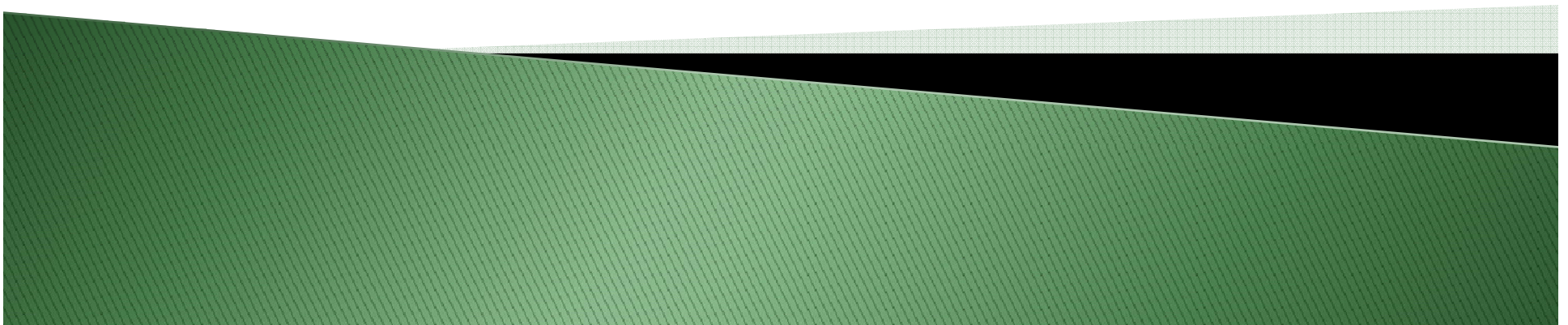


Renewable Energy Trends in Latin America

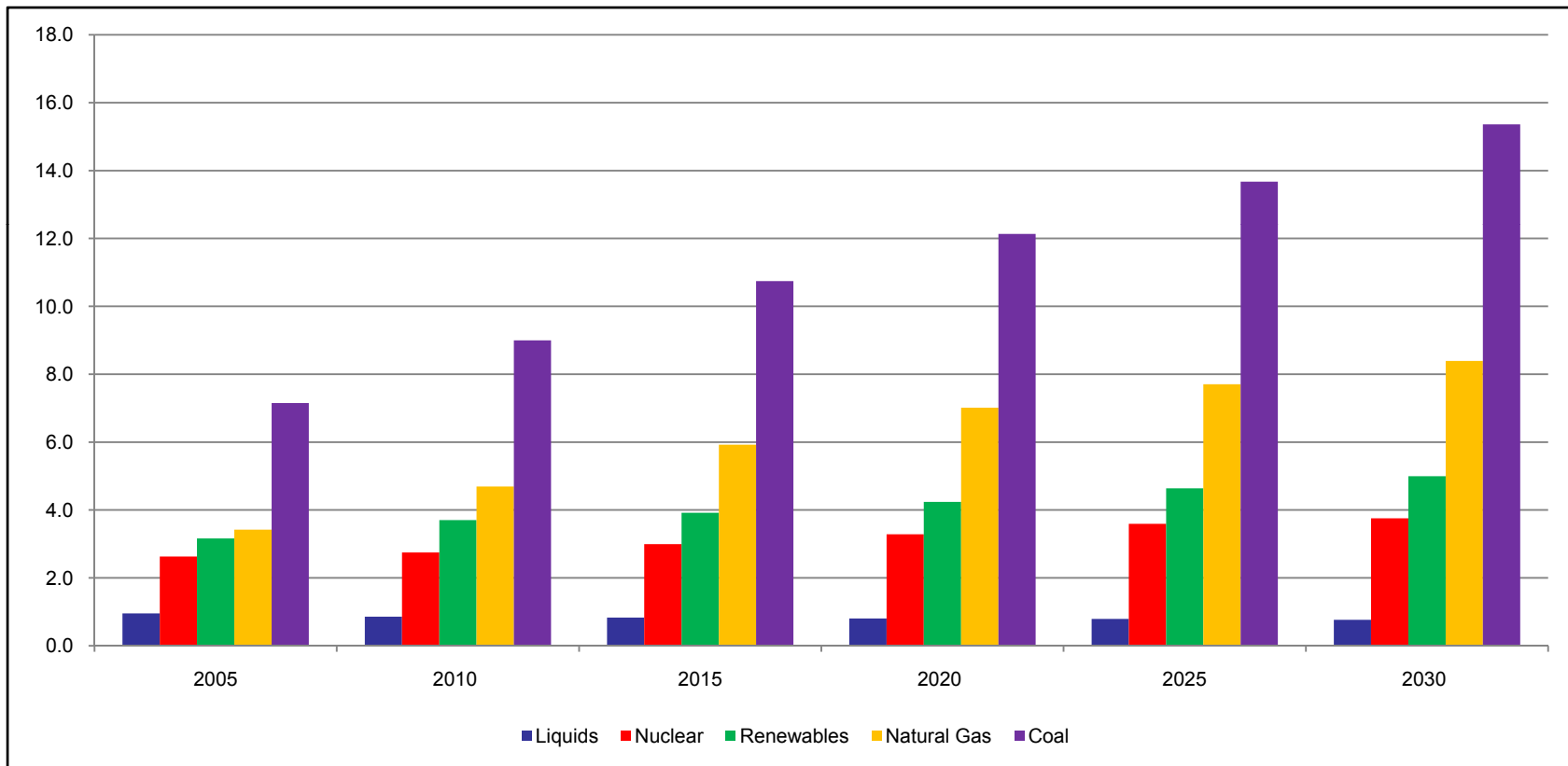
Brent de Jong
Vice Chairman, AEI

February 26, 2008



Coal and natural gas remain the dominant fuel sources for power generation globally

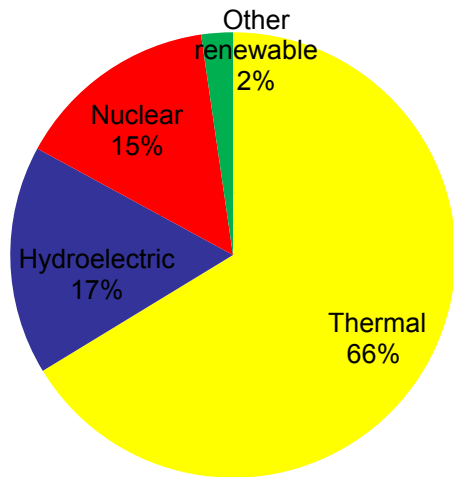
Global Electricity Generation (2005 – 2030 Forecast)



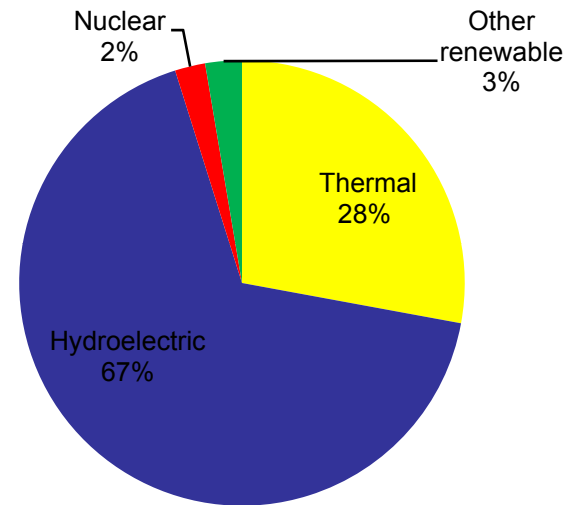
Cost, scale and time to market are drivers for continued coal dominance

Hydroelectric power is the main source of power generation in Latin America, which is in contrast to global

Global Power Generation (2006)



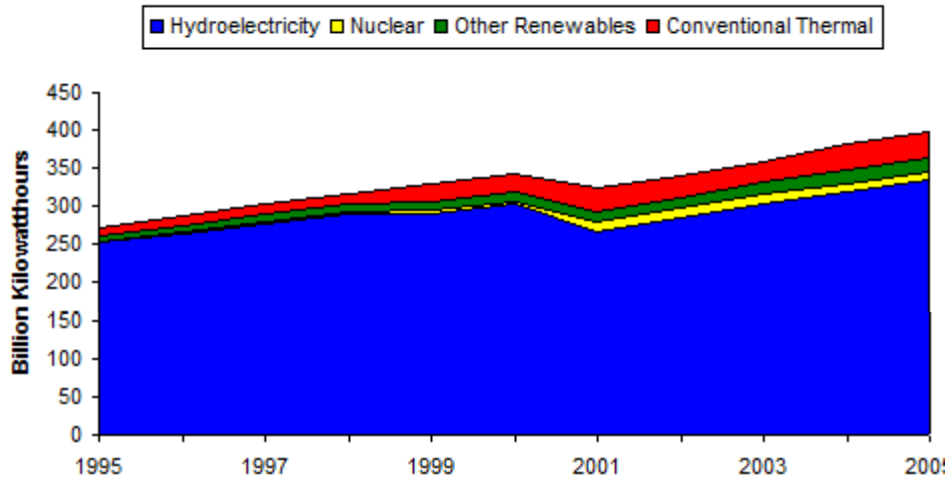
Latin America Power Generation (2006)



Strong growth in energy demand coupled with dry seasons has forced Latin America to turn to traditional thermal power generation to satisfy energy needs and ensure security of supply.

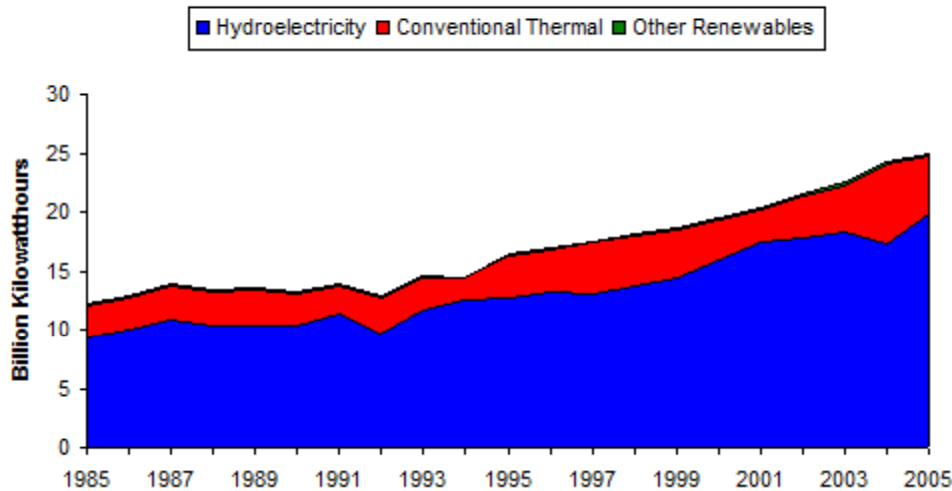
Brazil remains the leader in South America in the use of renewable energy...

Brazil

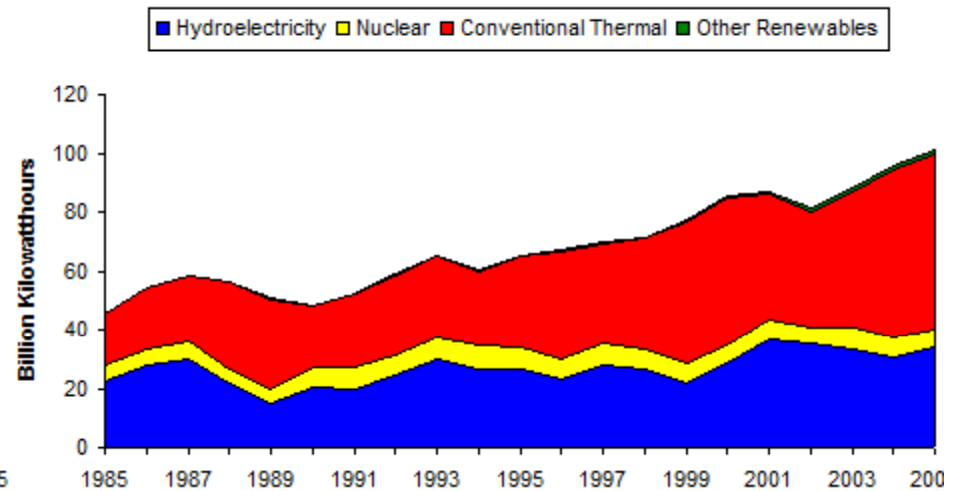


- ▲ Brazil generates 84% of power from hydro and 4% is from other renewable sources (mainly biomass).
- ▲ Low price of natural gas throughout the continent has allowed rapid growth in thermal generation and other gas consumption in industrial and vehicles, while displacing hydro projects
- ▲ Imbalances have developed in the system as gas infrastructure and reserves have not maintained similar growth rates as consumption

Peru

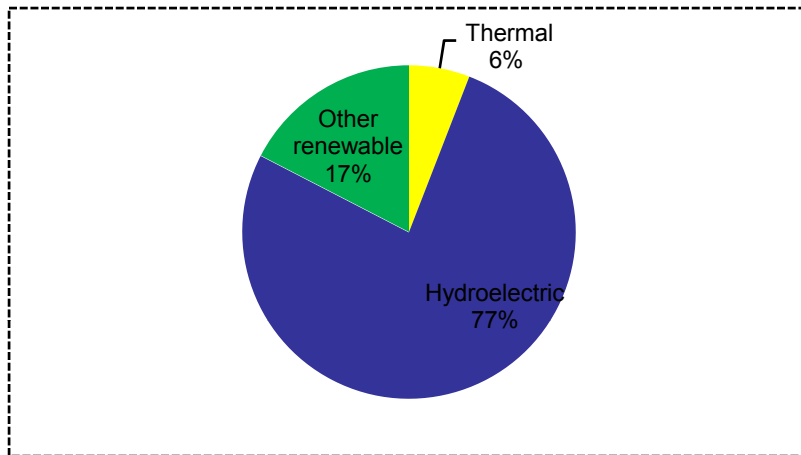


Argentina



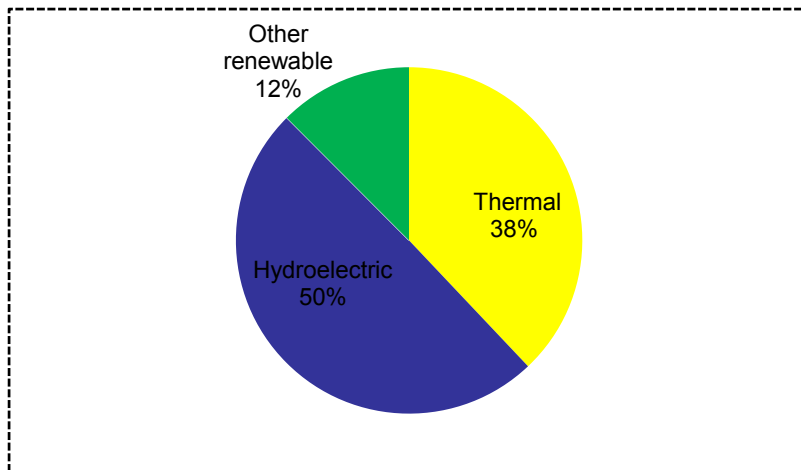
... and Costa Rica is the leader in Central America

Costa Rica

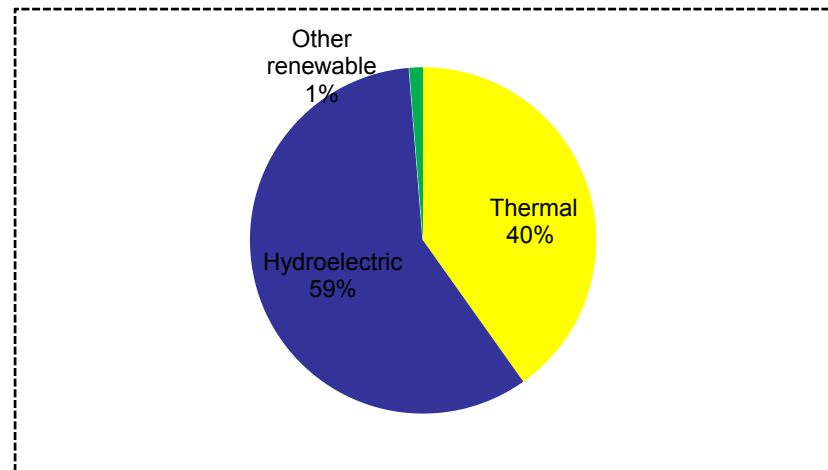


- ▲ Costa Rica generates 94% of electricity from renewable sources.
- ▲ High exposure to hydro and small reserves makes Central America vulnerable to blackouts during dry seasons.
- ▲ Central America is increasingly turning to fossil fuels to satisfy growing demand as it is quicker to market, provides fuel diversity (coal), and is reliable back-up to hydro.
- ▲ Nonetheless spot energy prices have skyrocketed.

Guatemala



Panama



Latin America is keeping pace with global leaders in renewable energy use

Hydro (2006)

Rank	Country	Installed Capacity (GW)	Consumption (MM tons oil equivalent)
1	China	171.5	94.3
2	US	99.2	65.9
3	Brazil	73.4	79.2
	Venezuela	14.5	18.4
	Mexico	10.7	6.8
	Argentina	9.8	9.7
	Colombia	8.9	9.6
	Paraguay	7.4	N/A
	Chile	5.0	6.7
	Peru	3.2	4.1

Source: BP Statistical Review - Full Report 2007; UN Data

Geothermal (2006)

Rank	Country	Installed Capacity (MW)	Production (GWh)
1	US	2,564	17,917
2	Philippines	1,930	9,253
3	Mexico	953	6,282
	Costa Rica	163	1,145
	El Salvador	151	967
	Nicaragua	77	271
	Guatemala	33	29
	Argentina	1	N/A

Source: Geothermal Resource Council; UN Data

Wind (2008)

Rank	Country	Installed Capacity (MW)
1	US	25,170
2	Germany	23,903
3	Spain	16,754
	Brazil	341
	Mexico	85
	Costa Rica	70
	Argentina	29
	Colombia	18
	Nicaragua*	40

* Represents AEI wind farm which will have approximately 40 MW installed capacity in 2009

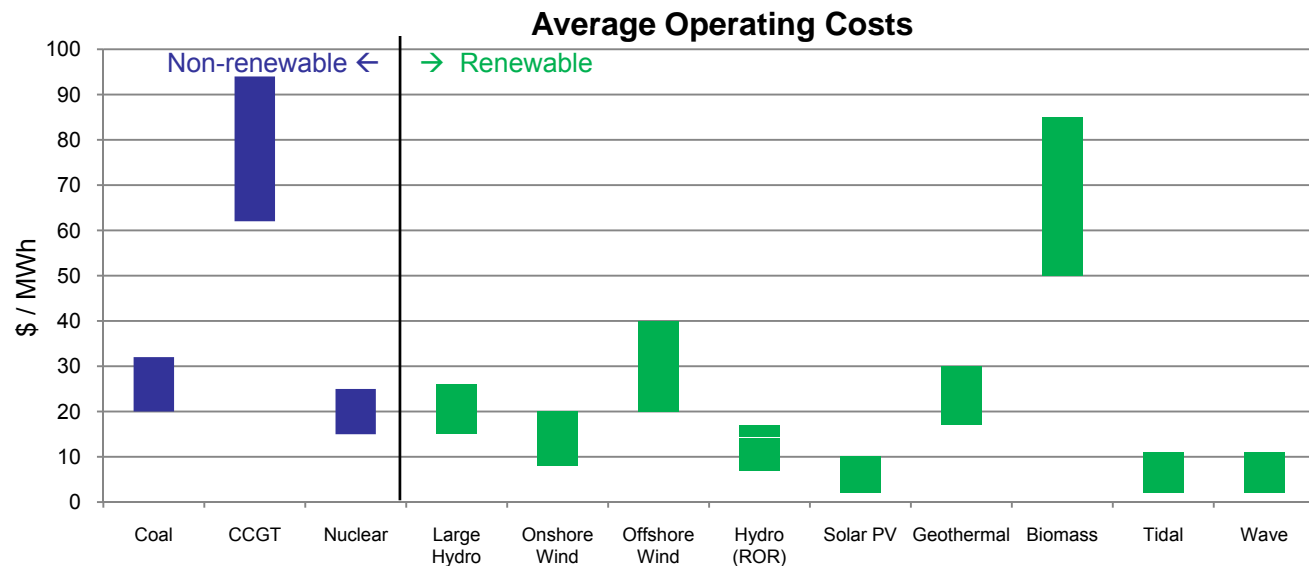
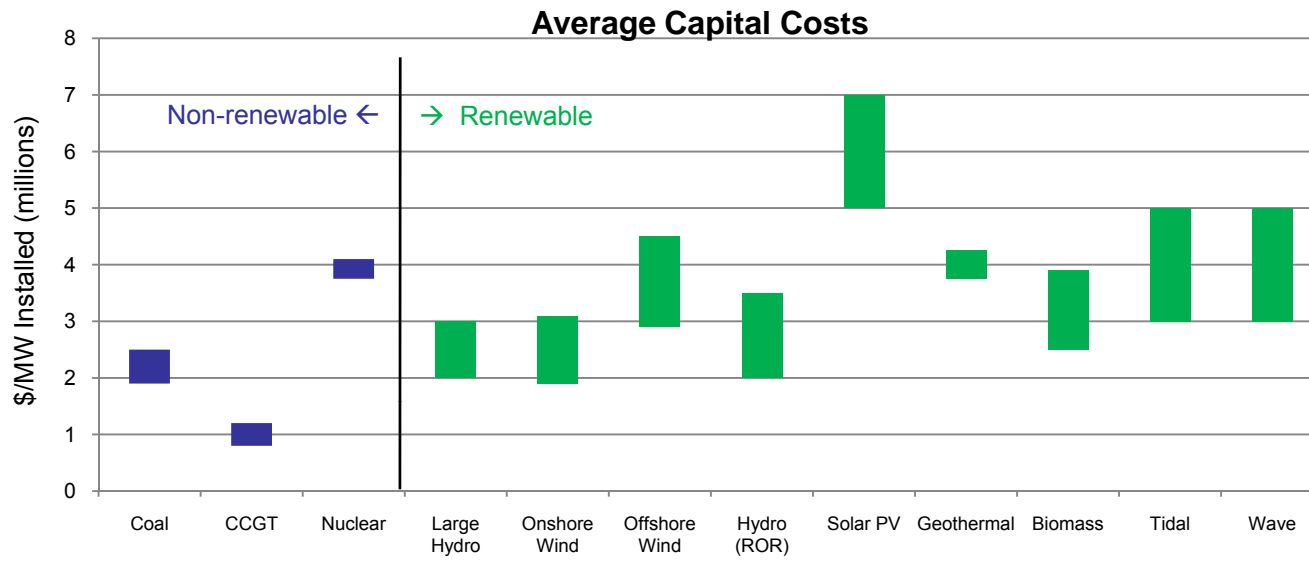
Source: Global Wind Energy Council, AEI data, UN data

Bioethanol (2007)

Rank	Country	Production (MM Gallons)
1	US	6,498.6
2	Brazil	5,019.2
3	EU	570.3
	Colombia	74.9
	Central America	39.6
	Peru	7.9
	Argentina	5.2
	Paraguay	4.7

Source: Renewable Fuels Association, 2008 Ethanol Industry Outlook

High capital costs continue to be a barrier to entry for renewable



Costs of Renewable

- ▲ Renewable energy is generally more costly to develop but cheaper to operate.
- ▲ Solar photovoltaic ("PV") is the fastest growing energy technology (globally) and is also the most expensive renewable resource; costs will decrease as technology improves and with economies of scale.
- ▲ The cheapest renewable sources to develop are hydro and on-shore wind.
- ▲ Operating costs of renewable sources are cost competitive with traditional coal and CCGT.

Three Latin America countries are major world CO₂ emitters despite the use of renewable resources

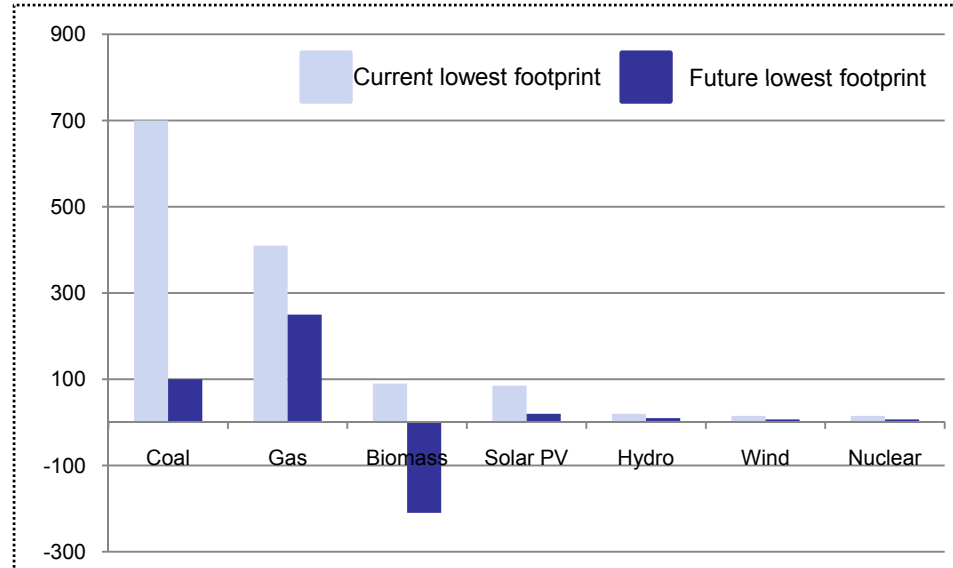
Major CO₂ Emitters*

Rank	Country	mT/CO ₂
1	US	6,928
2	EU	5,067
3	China	4,938
<hr/>		
8	Brazil	851
14	Mexico	512
24	Argentina	289

Brazil's carbon emissions are derived mainly from deforestation, not the use of fossil fuels

* Based on year 2000 data. Source: World Resource Institute

CO₂ Emissions from Power Generation*



* Based on power plants in the US, Europe, Australia. Source: UK Parliamentary Office of Science & Technology, October 2006

Renewable Energy Emissions

- ▲ ALL generation technologies emit CO₂ during some point of the lifecycle (e.g. during construction and manufacturing phases).
- ▲ Co-firing in existing power plants (usually coal) with an alternative fuel like bagasse can be used to reduce CO₂ emissions.
- ▲ Coal-fired plants have an average energy efficiency of 35%, and CCGT plants have an average efficiency of 55%. Improving energy efficiency is one way to reduce emissions of thermal plants.

Key drivers in the growth of renewable energy use

Installed capacity for renewable energy in Latin America is forecast to grow over 12% annually from 2006 to 2013*

Energy Independence

- Central America must import oil or find alternative energy sources because it has little or no oil or refining capacity.
- Chile is building LNG terminals given the curtailment of gas exports from Argentina
- Argentina has installed a LNG off loading facility in BA and cut electricity exports to Brazil.
- Brazil is developing its own natural gas fields to reduce reliance on Bolivian natural gas exports or Argentine electricity.

Price or cost of energy

- Brazil uses sugarcane ethanol blended with gasoline which is comparable in price to gasoline; bagasse is then used to generate power.
- Costa Rica relies on abundant hydro resources to produce electricity rather than importing expensive oil or natural gas.
- Colombia and Argentina are increasing the use of automobiles that run off compressed natural gas ("CNG").

Legislation Abroad

- Kyoto Protocol calls for developed countries to reduce GHG emissions and to invest in Clean Development Mechanisms (CDM) to generate emissions credits; there are 800+ CDM projects in Latin America.
- Annex I (developed country) regulators have established Renewable Portfolio Standards (RPS) requiring them to import renewable resources from abroad.
- Global use of gasoline blending has increased the ethanol market in Brazil.

Public Perception

- Local legislation incentivizes the use of renewable energy (e.g. subsidies, tax relief, and feed-in tariffs) by making renewable sources more cost competitive with traditional energy sources.
- Feed in tariffs are used in Brazil, Costa Rica, Nicaragua, Argentina, and Ecuador to promote the use of renewable energy.
- Argentina plans to generate 8% of electricity from renewable sources by 2016.

*Growth represented by 12.5% CAGR. Source: Study by Frost & Sullivan, 2007 (www.frost.com).

Brazil is an innovator in the use of biofuels to fulfill energy needs

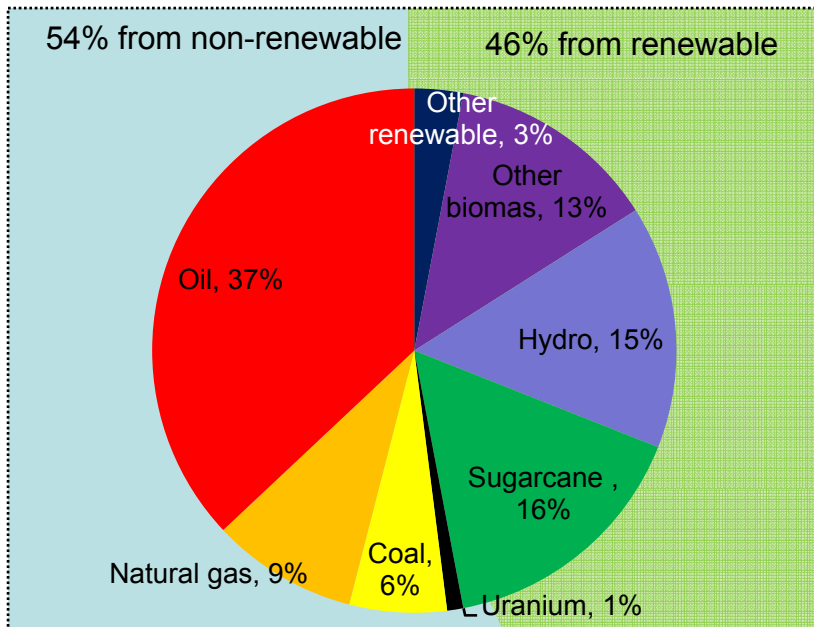
Brazil's Ethanol Industry Snapshot

- ▲ Brazil exported 5.2 billion liters of ethanol fuel in 2008 (20% of total production), up 45.7% from 2007.
- ▲ Brazil's 30-year-old ethanol fuel program is based on highly efficient agricultural technology for sugarcane cultivation and cheap sugar cane as feedstock.

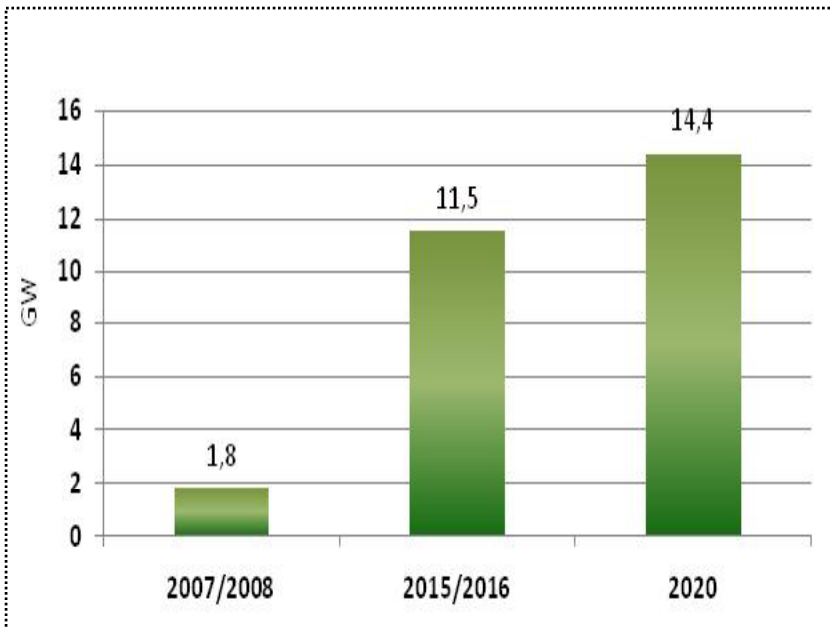
Ethanol Use in Power Generation

- ▲ Sugarcane production is expected to double from 2007 to 2016.
- ▲ 52% of sugarcane is processed to sugar and 48% is processed to ethanol. Residual cane-waste (bagasse) is used to create heat and power.
- ▲ Sugarcane mills sold 2,400 MW at public auctions in 2008 (229 MW for 2009 and 2,150 MW for 2010).

Brazil's Energy Supply, by Fuel



Power Generation from Sugarcane Bagasse



Source: BalançoEnergéticoNacional; Empresa de Pesquisa Energética, - www.epe.gov.br,

Proprietary and Confidential

Source: Empresa de Pesquisa Energética, - www.epe.gov.br

Brenco is developing Brazil's first world scale, export-oriented project for the production of ethanol and power co-generation

Brazilian Renewable Energy Co. ("Brenco")

- ▲ **Reliable Global Supplier:** Brenco's goal is to become one of the largest sugarcane ethanol producer focused on the supply to international markets
 - Growing international demand
 - Long-term comparative advantage in Brazil
 - Captive and growing domestic market as buffer
- ▲ **Low Cost Producer:** Brenco is expected to become the world's lowest cost producer of ethanol
 - **Scale:** Total CAPEX of US\$3bn for 44m tons of crushing capacity by 2015, equivalent to 10% of projected Brazilian ethanol market
 - **Greenfield Cluster Approach:** 3 Clusters totaling 12 mills with state-of-the-art facilities
 - **Focus on Renewable Energy:** Ethanol only project with 1 billion gallons capacity. Maximization of Power co-generation with the burning of straw in addition to bagasse
 - **Integrated Model:** Strategic position to effectively participate in the entire ethanol supply-chain
- ▲ **Governance & Sustainability Differentiates Brenco from any other player in the sector**

Advantages of Sugarcane Ethanol vs. Corn

	<u>Corn</u>	<u>Sugarcane</u>
Superior Yields	321 gallons/acre	772 gallons/acre
Lower Production Cost	55-60 US\$/barrel	30-35 US\$/barrel
Superior Energy Return Ratio	1.3x - 3.1x	8.3x - 10.0x
Hedged on Energy Cost	External sources of Natural Gas & Power	Self-produced Steam & Power
Hedged on Raw Material Cost	Margin is affected by Corn Prices. Direct competition with food supply	A pricing formula links sugarcane prices to sugar & ethanol.
Superior Technological Potential	Cellulosic Ethanol would eliminate corn-based ethanol production	Cellulosic Ethanol will enhance competitive advantage due to large biomass content
Larger Growth Potential	The US lacks additional land & water sources for incremental production	Brazil has more than 200 million ha of land suitable for sugarcane

Source: Brenco

Latin America has 48% of the global Compressed Natural Gas vehicle fleet

Argentina – well developed industry

- ▲ Well developed natural gas vehicle (“NGV”) industry - 1.7 MM converted vehicles and 1,700 refueling stations
- ▲ 15% of vehicles run on natural gas
- ▲ 3-year plan to convert 1,000 heavy duty vehicles from diesel to CNG through a possible elimination of current diesel subsidy
- ▲ Argentinean NGV manufactured products are exported to several countries in Latin America, Europe, and Asia

Colombia – fastest growing industry

- ▲ NGV fleet of over 250,000 vehicles and 378 refueling stations
- ▲ By 2010, the industry expects to increase fleet to 355,000 vehicles and fueling stations to 600 stations
- ▲ Investment required to develop the NGV Program through 2010 is US\$115 million
- ▲ Program generates estimated savings of US\$ 450 million per year for the customers and US\$ 55 million per year for the government by reducing the need for subsidized oil

CNG – non-renewable but cleaner burning than gasoline

- ▲ Energy efficiency of CNG is generally equal to that of gasoline engines, but lower compared with modern diesel engines
- ▲ CNG produces less CO₂ emissions than gasoline and other alternative fuel sources:
 - Reduce carbon monoxide emissions by 90%-97%
 - Reduce carbon dioxide emissions by 25%
 - Reduce nitrogen oxide emissions by 35%-60%

Most Latin America countries have developed energy policies to promote and regulate renewable energy development

Argentina

- ▲ Biofuels Act (2006) – mandates the use of 5% biofuels in bio-ethanol or bio-diesel mix in the gasoline and diesel distributed in Argentina by 2010
- ▲ Promotion of Renewable Energies (2006) - establishes goal of achieving 8% of power consumption from Renewable Energies
- ▲ Nuclear Action Law – provides a regulatory framework for the investigation and development of Argentina’s nuclear program
- ▲ Renewable Energy Law (2007) - outlines which sources of renewable energy will qualify for state support, provides tax breaks for renewable energy equipment, and offers tariffs for certain renewable resources; promotes wind, solar, and small hydro power, a fuel cell project, and rural electrification

Brazil

- ▲ Law 10.438 establishes the Incentives Program for Alternative Sources of Electric Energy (PROINFA) for wind, biomass and small hydro
- ▲ Biodiesel Program - Agrobusiness corporations and small family farms and businesses can earn tax credits by purchasing feedstock from family farms and entering an agreement for a specified income levels, and guaranteeing technical assistance and training
- ▲ National Alcohol Program (PROALCOOL) – initiated in the 70’s; provided significant funding, subsidies, and tax breaks to develop the ethanol industry.
- ▲ Wind Energy Emergency Program (PROEOLICA) – in 2001 PROEOLICA called for the addition of 1,000 MW of installed wind capacity to be added to the grid in response to the electricity crisis brought on by droughts

Colombia

- ▲ Law 967 (2001) - promotes the efficient and rational use of energy and also promotes the alternative energies
- ▲ Law 671 (2001) – establishes the legal framework for sustainable energy in Colombia, establishing responsibilities of the Ministry of Energy and Mines for the promotion of energy efficiency and renewable energy.
- ▲ A new law for the use of gasoline with 10% fuel alcohol from sugarcane and yucca agricultural wastes went into effect in 2006

Most Latin America countries have developed energy policies to promote and regulate renewable energy development

Costa Rica

- ▲ National Plan for the Expansion of Electricity Generation (2000 – 2010) - 80-90% of newly installed generation capacity should be from renewable sources. Regulator, ICE, has committed to generate 100% of electrical energy from renewable sources and has accelerated the development of hydro and geothermal projects
- ▲ ICE developed all power plants in the past with government funding but is now turning to the private sector to develop future capacity to fulfill power needs, pursuant to Law 7200 passed in 1995 which allows private parties to participate in power generation where the sources are renewable

Mexico

- ▲ Law for the Use of Renewable Sources of Energy (LAFRE) (2003) - Establishes the creation of a Program for the Use of Renewable Energy Sources of Energy. A minimum percentage of 8% in renewable energy contribution to total energy generation is established as a goal for 2012. This goal does not include big hydroelectric plants
- ▲ Wind energy promotion - A project expects to reduce national carbon dioxide emissions by 4 million tonnes per year by promoting the development of a commercial wind energy market with an installed capacity of 2000 MW by 2015; \$4.7 MM in funding has been allotted

Nicaragua

- ▲ Law on Promotion of Electricity Generation with Renewable Resources (2005) - declared the development and exploitation of renewable resources to be a national interest and established tax incentives for renewables

Panama

- ▲ Law No 45 establishes incentives to new generation projects from renewable sources and provides incentives in the form of exemptions from distribution and transmission wheeling charges, import taxes, tariffs, rates, and income taxes
- ▲ In the case of hydro, Law 45 allows for an exemption of up to 50% of income tax during first 10 years limited to 25% of direct investment or equivalent CO2 reduction in 50 years;
- ▲ Law 6 establishes a 5% preference in the price assessed in a bid for a power plant using renewable sources compared to a conventional thermal plant