



*Sustainable Energy For All*

*XIX Annual Latin  
American Energy  
Conference*

*The La Jolla Conference  
May 11, 2010*

## Current Situation

According to ECLAC\* between 2007 and 2030 LAC will **require an investment of US\$1.27 trillion** or US\$55 billion per year for the energy sector.

Projected investments through 2030

### •Electricity Sector:

- generation US\$324 billion,
- transmission US\$124 billion,
- distribution US\$271 billion.

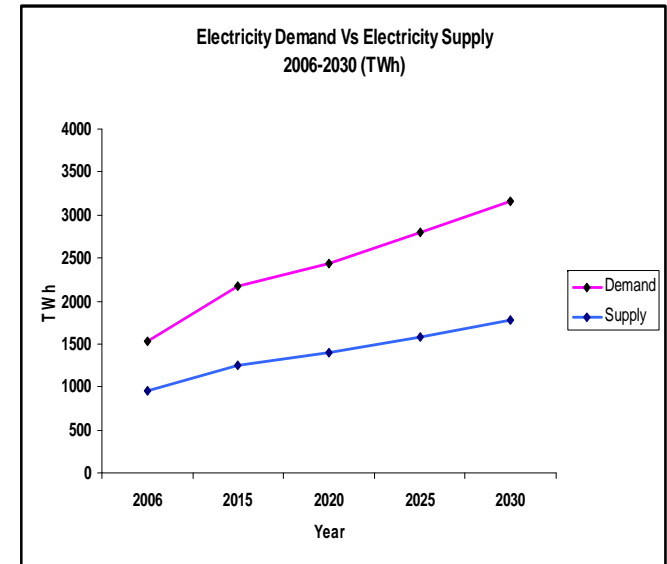
### •Oil Sector:

- upstream investments US\$270 billion,
- refining US\$42 billion,
- processing heavy crude US\$66 billion.

### •Natural gas:

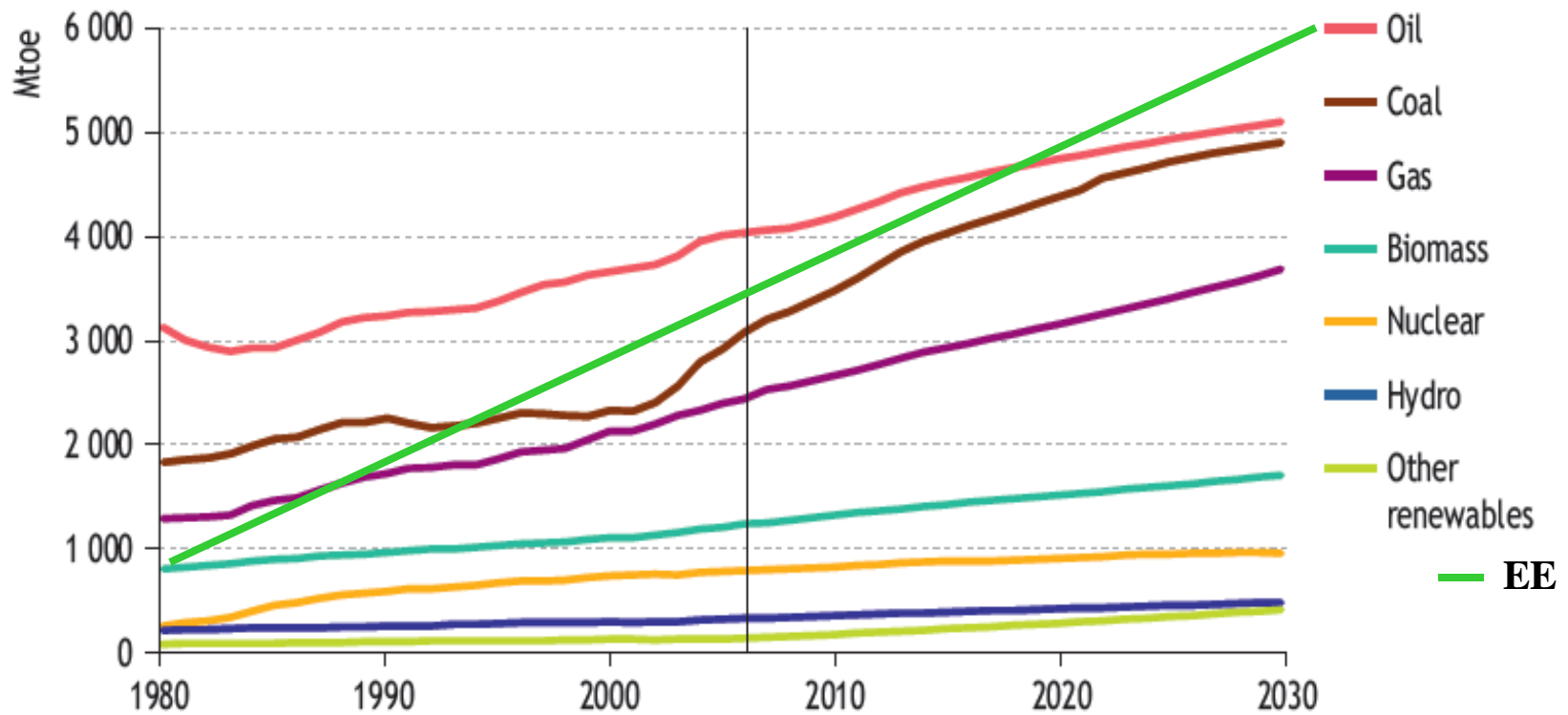
- exploration and production US\$148 billion,
- transport US\$54 billion,
- liquefied natural gas US\$22 billion.

\*Economic Commission for Latin America and the Caribbean



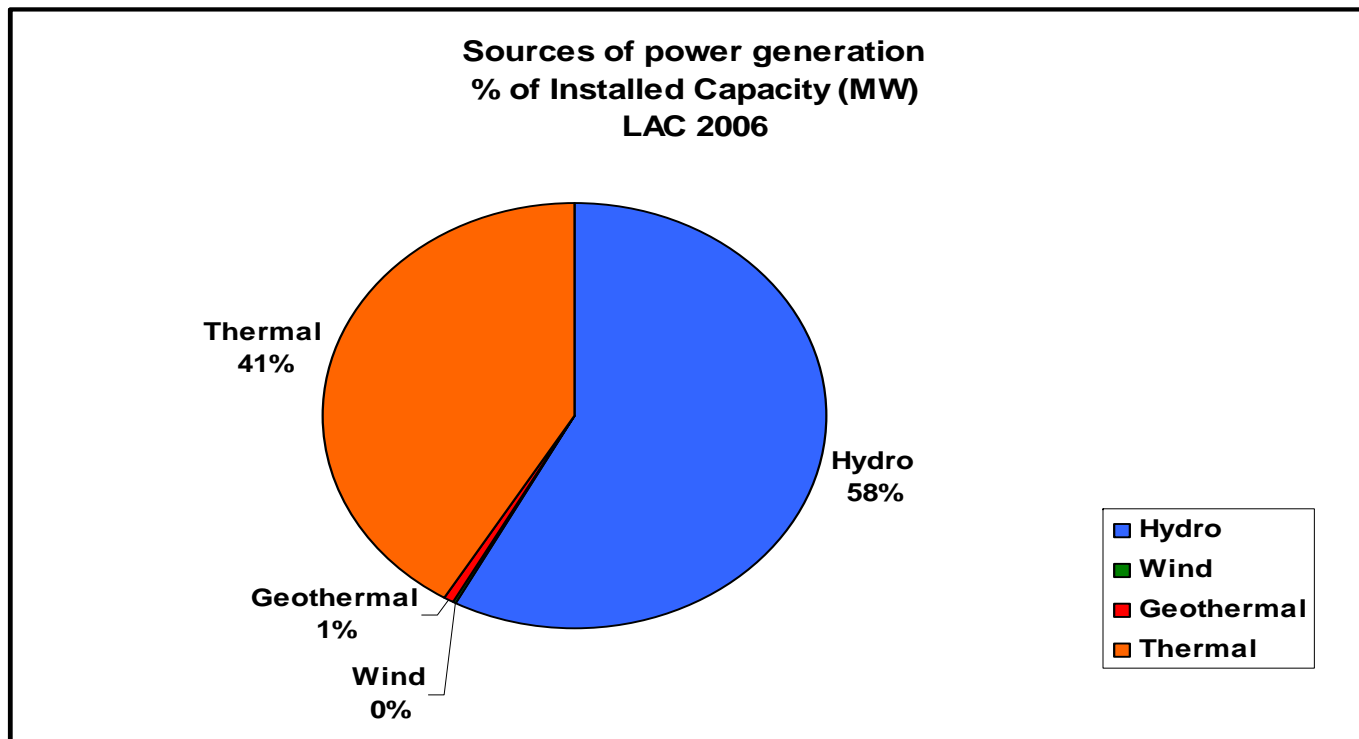
# Primary Energy Demand by Fuel

**Figure 2.1** ● World primary energy demand by fuel in the Reference Scenario



## Sources of Power Generation

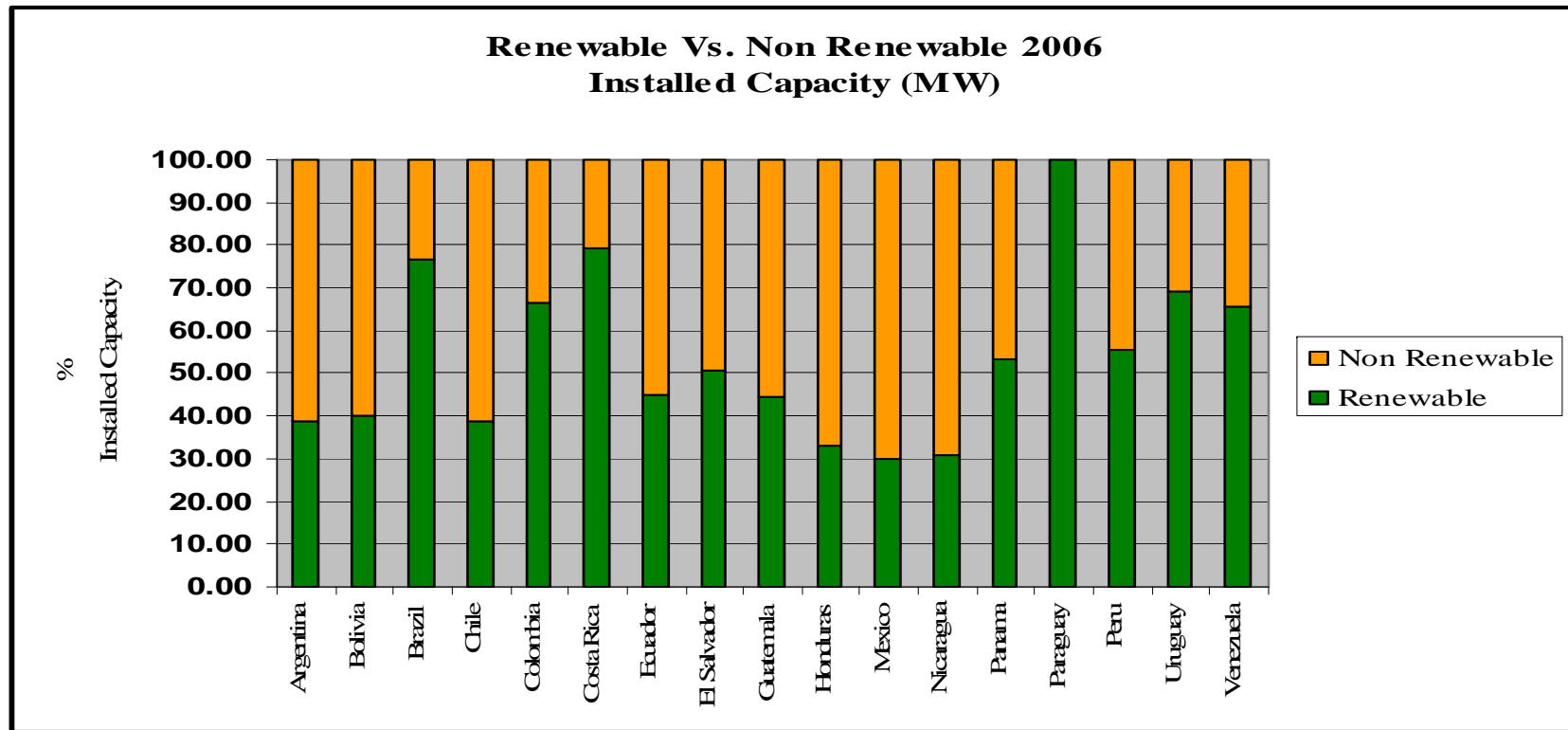
Although LAC's share of renewable energy as a source for electricity generation is relatively high due to hydroelectric power, non conventional renewable energy (wind, solar, geothermal) contribution is minimal.



Source: CIER, OLADE, CEPAL, EIA, various national energy entities

# Energy Sources

## Renewable Energy Sources for Electricity Generation Including Large Hydroelectric

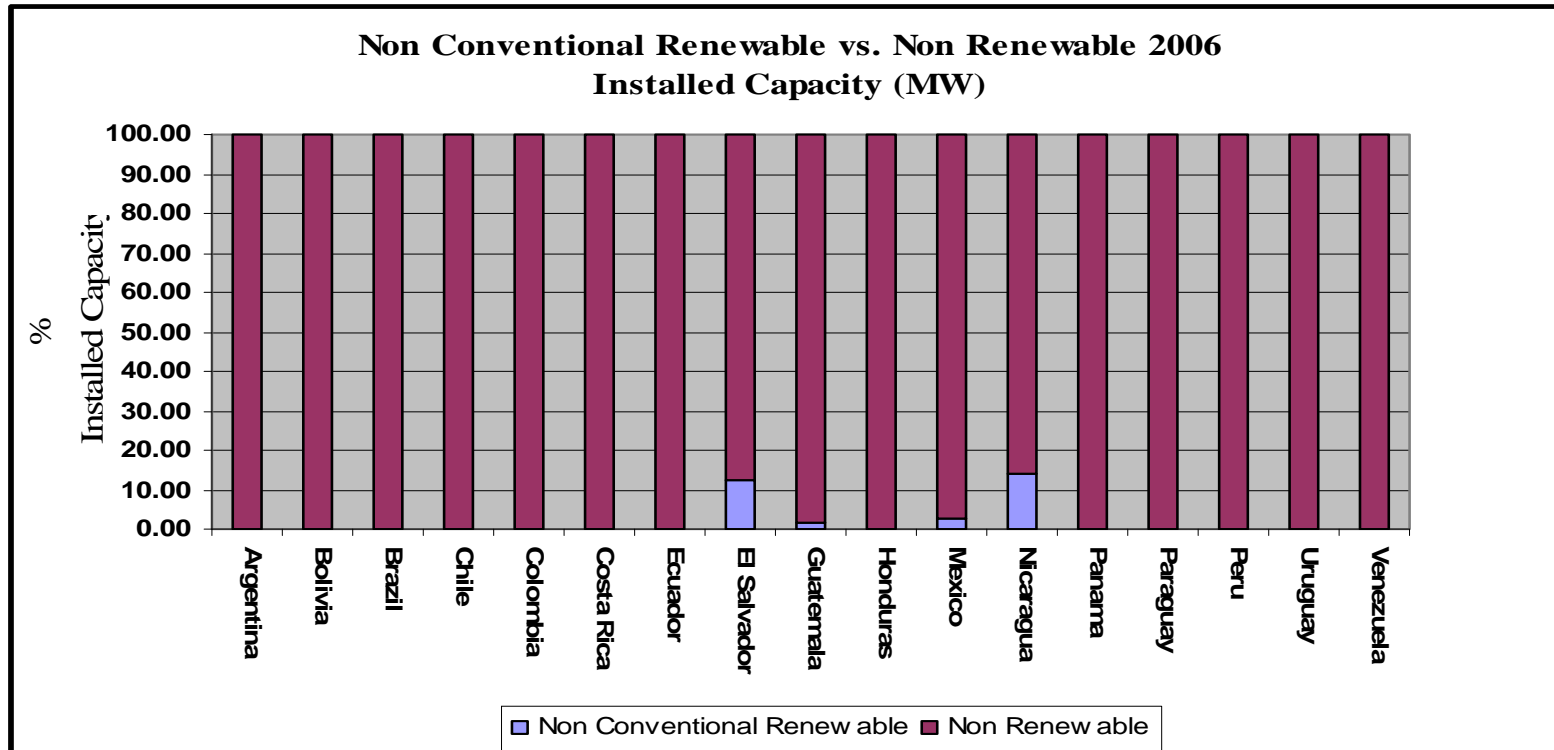


Source: CIER, OLADE, CEPAL, EIA, various national energy entities



# Energy Sources

## Non Conventional Renewable Energy Sources for Electricity Generation Excluding Large Hydroelectric



Source: CIER, OLADE, CEPAL, EIA, various national energy entities

## *Issues Related to the Energy Sector*

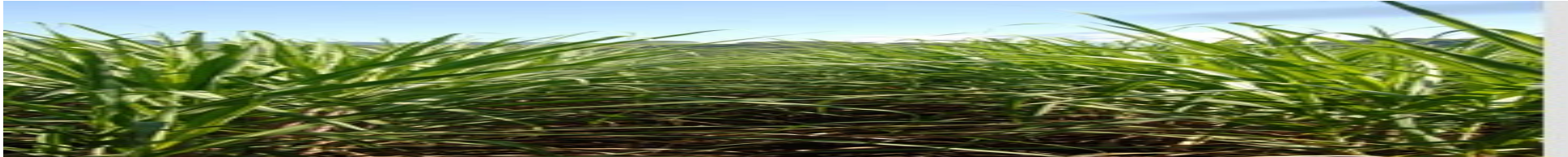
- **On-going Cost of Fossil Fuels**
  - Pass-through provisions in the PPA
  - Sustainability of Energy Sector
    - Case of Central America and the Caribbean
  
- **Volatility of Renewable Energy**
  - Volatility of Inputs
    - Case of Colombia & Venezuela

## *IDB's Vision*

- **New Energy Leapfrog Traditional Energy**
  - 1980s Telecom 2010 Energy
- **Current Energy Sector**
  - Large Power Plants
  - Transmission Designed per Power Plant
  - Fossil Fuel Pass-through Provisions in PPA
- **New Energy Sector**
  - Indigenous Energy Sources
  - Eliminating Fossil Fuel Pass-through Provisions
  - Decentralized Generation – Net Metering
  - Duplication of Transmission and Distribution (required for RE)
  - Mitigating Natural Risk (wind, sun, water)



# *Renewable Energy and Climate Change*



- **Key aspects**

- LAC's **power sector contributes marginally to total global emissions** (3%-4%), but trend is to increasing energy demand & increased use of fossil fuels.
- **LAC reliance on hydro resources** (62% of installed capacity), relates to high exposure to climate change impacts (hydrology volatility).
- **1% of the Renewable Energy potential** from wind, geothermal, sun and marine energy could represent the **largest GHG mitigation alternative**. Currently less than 1% of installed capacity in LAC is provided by these sources.

# Cost to Construct New Energy Generation

## Capital Cost of New Electricity Generating Technologies

Source	US\$/kW*
Diesel*	400
Gas (CCGT)*	717
Wind	1,434
Coal*	1,534
Hydro	1,551
Nuclear	2,475
Solar PV**	3,954

VS.

Source	US\$/kWe
Energy Efficiency	200-250
Hydro rehabilitation	600-700

IDB calculations

Source: Energy information Administration, [www.eia.doe.gov](http://www.eia.doe.gov) 2007.

\*Overnight Cost: capital cost only as if the project was completed overnight and without interest. \*\* IDB calculations. Fuel costs are not in calculation.

\*\* 30% reduction in Capital Costs in the last 12 months.



## *IDB's Actions in Renewable Energy*

- **Expanding access to finance** for renewable energy projects
- Promote **structured finance** within the sector through:
  - **Public assets** serving as **guarantees** for future expansion projects.
  - **PPPs without public capital injections.**
  - Temporary and **Revolving Sovereign Guarantees.**
- **Cost Structure of Tariffs for Renewable Energy**

Capital Cost + O&M Cost + Debt + ROE = PPA = Tariff

NSG            =            =            6-8%    20% = higher PPA

SG             =             =             2%       0% = lower PPA



# *Complementing Renewable Energy with Traditional Energy*

## **Projects That Utilize Current Energy Infrastructure:**

- Central America and the Caribbean are based on Fossil Fuel
- Make Current Combined Thermolectric Power Plants more Efficient with Thermo-Solar Investments
- Case Study:
  - Mexico – CFE – Thermo-Solar Investments
  - Produces 15% to 19% of existing combined cycle plant
  - Does not require additional Steam Turbines
  - Less expensive, can be brought to fruition faster given exiting infrastructure
    - Steam Turbines
    - Connection to Grid
    - Site Specific

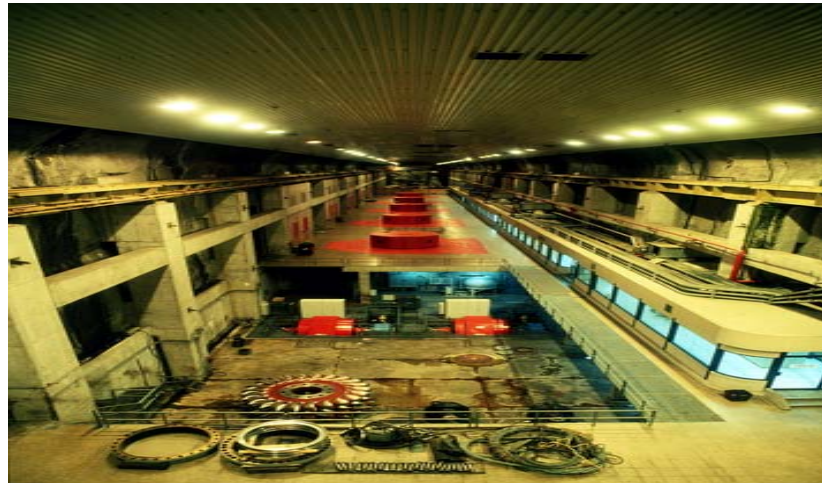


## *Hydroelectric Rehabilitation*

### *– Lowest Cost of Renewable Energy*

#### **Rehabilitation of Existing Renewable Hydroelectric Plants**

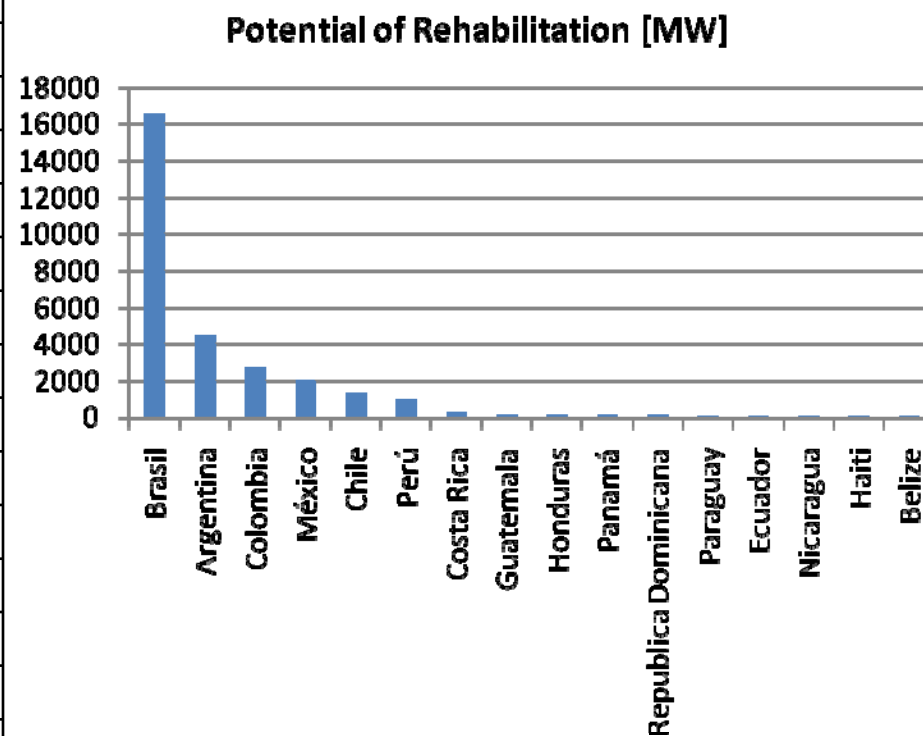
- In LAC hydroelectric project construction took place mostly in the 1960s and 1970s.
- It is expected that electro-mechanical equipment in other countries will start reaching end of useful life.
- IDB is executing hydroelectric rehabilitation projects in Brazil, Nicaragua, Haiti, and Costa Rica.



# Rehabilitation of Hydroelectric Power Projects

Country	Nominal Power (MW)	Potential of Rehabilitation (MW)
Brazil	41,392	16,557
Argentina	11,271	4,508
Colombia	6,848	2,739
México	5,053	2,021
Chile	3,332	1,333
Perú	2,390	956
Costa Rica	735	294
Guatemala	439	176
Honduras	432	173
Panamá	360	144
Rep. Dominican	289	116
Paraguay	200	80
Ecuador	194	78
Nicaragua	100	40
Haiti	54	22
Belize	25	10
<b>TOTAL</b>	<b>73,113</b>	<b>43,868</b>

## Rehabilitation of Existing Renewable Hydroelectric Plants



# *IDB Renewable Energy Projects 2010*

## **Renewable Energy**

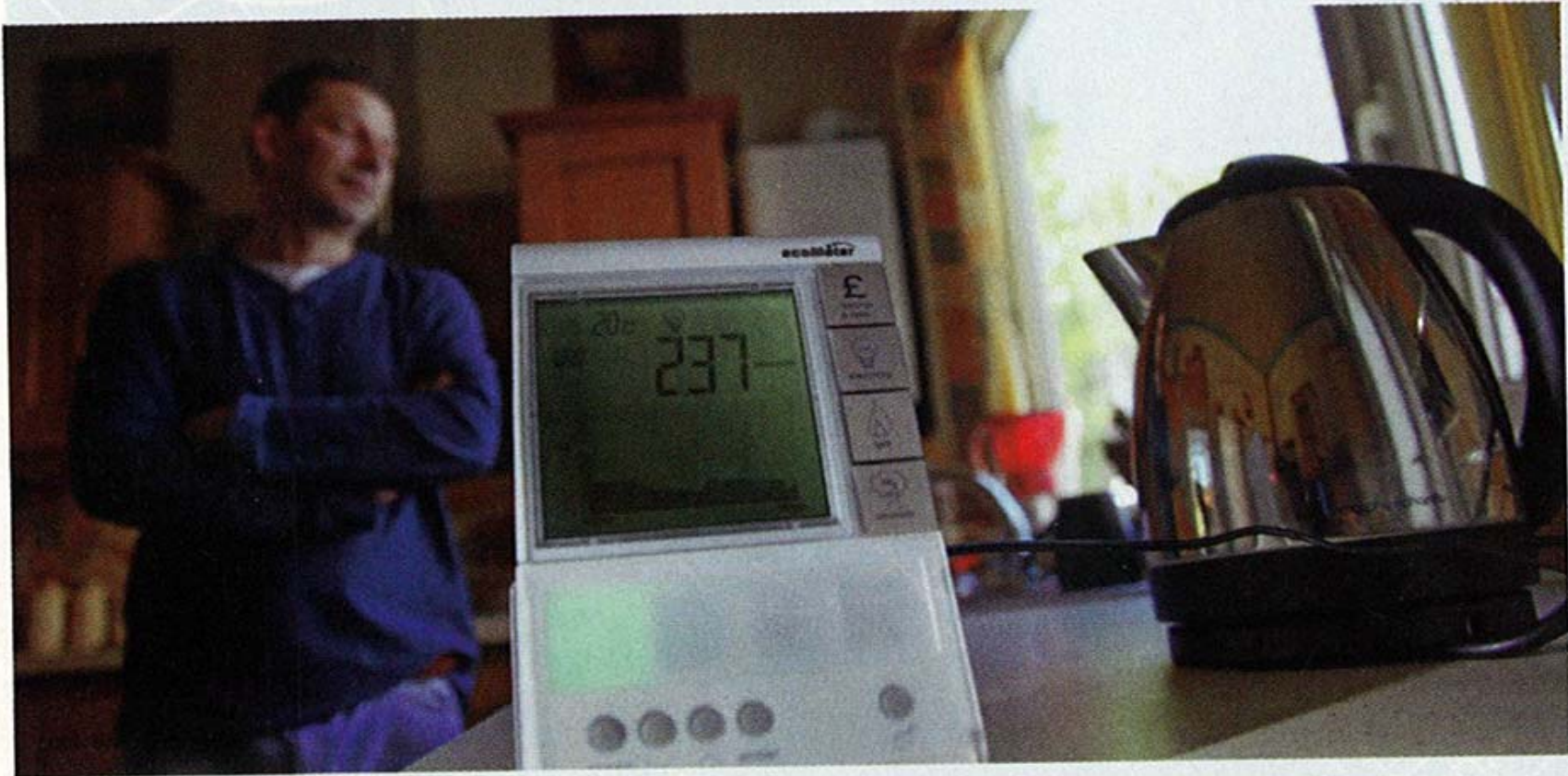
### Developing Renewable Energy Projects

Country	Project Name
Argentina	Wind power of the south program
Bahamas	Sustainable energy program
Barbados	Sustainable energy implementation program
Ecuador	Hydroelectric Project Preparation
Bolivia	Rural electrification program
Brazil	Hydroelectric power plant rehabilitation program
Chile	Sustainable energy
Paraguay	Sustainable energy infrastructure
Haiti	Rehabilitation of the electricity distribution system in “ <i>Port-au-Prince</i> ” - II
Nicaragua	Sustainable electrification and renewable national program



# Background: what is new today

## Briefing Smart grids



v  
c  
c  
qui  
abl  
wo  
d co  
lly to  
er sup  
y need  
es of e

### A smarter cup of tea

▼▼ achievement of the 20th century? The motor car, perhaps, or the computer

money. In recent years American venture capitalists have put more than \$1 billion

and Europe; more than 50% in some big cities in developing countries. Outages cost



# *Energy Innovation Center*

(ENE-Innovation Center)



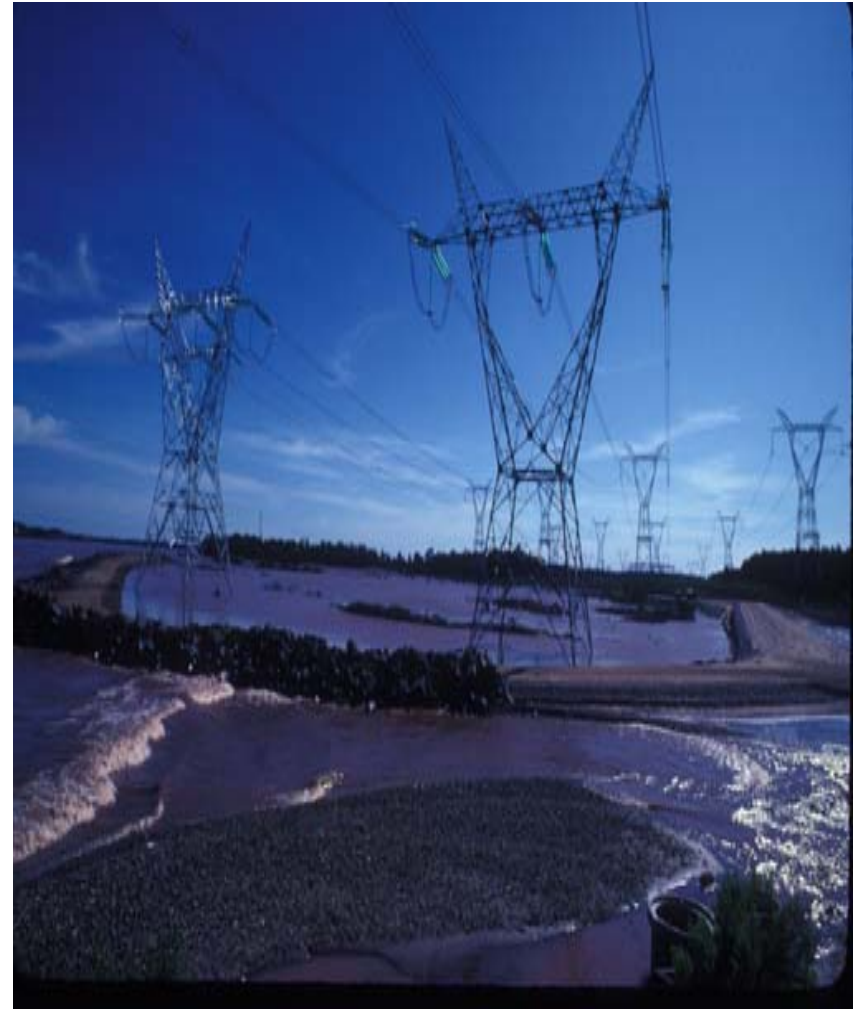
- The **U.S. Department of Energy** and the **IDB**
  - Under the Energy and Climate Partnership of the Americas
- **Regional incubator** for project implementation, offering technical assistance and capacity building programs.
- **The ENE-Innovation Center will:**
  - Support knowledge dissemination,
  - Provide technical assistance
  - Produce comprehensive briefings
  - Identify potential non-conventional renewable projects
  - Identify innovative funding mechanisms
- Serve as **center of excellence** for non-conventional renewable energy, energy efficiency, energy access and energy security
- The Energy Innovation Center will **serve as a knowledge hub** to the various renewable energy centers that are currently being developed.



## *IDB's Long-Term*

### **Support regional energy integration**

- Support the successful completion of ongoing projects, i.e. Mesoamerica Project (SIEPAC) and the Guatemala-Mexico interconnection;
- Promote new energy integration projects and support regional integration initiatives like IIRSA; and
- Support the development of potential new bi-national hydroelectric projects, i.e. Garabi (AR-BR) and Corpus (AR-PR).



# *Efficiency in the Oil and Gas Sector*

*Petroecuador*

*Petro-Peru*

*Eco-Petrol*

*Petrobras*

## **IDB's Involvement:**

Change Image of Petroleum Companies;  
Support Efficiency in Processing; and  
Support Environmental Initiatives.

# *IDEAS Contest*



## **Objectives:**

- Provide and promote sustainable energy solutions, improve the lives of people and generate innovative projects and ideas that could be replicated and scaled up in LAC.
- The program will finance approximately 50 innovative projects and project ideas that promote RE, EE and energy access in LAC.

**1094 IDEAS** were received;

**850 IDEAS** were eligible;

**264** included in the Final List (most innovative **IDEAS**);

**25 IDEAS** as **2009 Winners**





*Sustainable Energy For All*

Leandro Alves  
Head of the Energy Division  
Inter-American Development Bank  
1300 New York Ave., N.W.  
Washington, DC 20577  
[leandroa@iadb.org](mailto:leandroa@iadb.org)  
202-623-1382  
[www.iadb.org/energy](http://www.iadb.org/energy)

**Inter-American Development Bank / [www.iadb.org](http://www.iadb.org)**

