



Energy Security for Economic Development in Latin America and the Caribbean

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Presentation Outline



-
- Introduction to Energy Issues in LAC
 - Review of Energy Statistics
 - Several Strategies to Address Energy Sector Challenges
 - OAS/DSD Energy Programs
 - General Assembly Special Theme



What do we mean by *Energy*?



- What are the primary forms of **energy use**?
 - ◆ Electricity
 - ◆ Mechanical/Heat for industry
 - ◆ Transportation
 - ◆ Residential heat/cooking/non-electrical lighting
- What are the primary **“fuels” for energy production**?
 - ◆ Fossil fuels (oil, natural gas)
 - ◆ Nuclear
 - ◆ Renewables (hydro, solar, wind, biomass, geothermal)
 - ◆ Traditional fuels (wood, dung, candles, batteries...)





What are some of the *key challenges* associated with the energy sector?



- Grid-tied electricity
 - ◆ Addressing generation needs
 - ☞ Address growing demand (additional generation capacity; multinational interconnections)
 - ☞ Extension of transmission and distribution lines
 - ☞ Reliability of “fuel supplies” (natural gas lines; droughts; oil supply disruptions)
 - ◆ Rising/fluctuating fossil fuel prices (set by international markets)
 - ☞ Dependency on imports throughout much of the region
 - ◆ High capital cost of renewable energy options
 - ◆ Increasing the efficiency of energy generation and use



What are some of the *key challenges* associated with the energy sector?



- Rural electrification
 - ◆ Grid extension vs. household/community systems (solar, diesel generation...)
 - ◆ Poverty alleviation (household pollution/safety, community/agricultural applications)





What are some of the *key challenges* associated with the energy sector?



- Transportation issues
 - ◆ Reliability and cost of fuel supplies
 - ◆ Adequate roads and other modes of transport
 - ◆ Bio-fuels (and other alternatives)



What are some of the *key challenges* associated with the energy sector?



- Environment
 - ◆ Local pollutants (smog/other effluents; image)
 - ◆ Global - Climate Change (mitigation by reducing carbon emissions; vulnerability issues)
- Geography
 - ◆ The region has significant energy resources, but uneven distribution
 - ◆ Wide variation in consumption patterns (economic variances)
 - ◆ Highly urbanized region



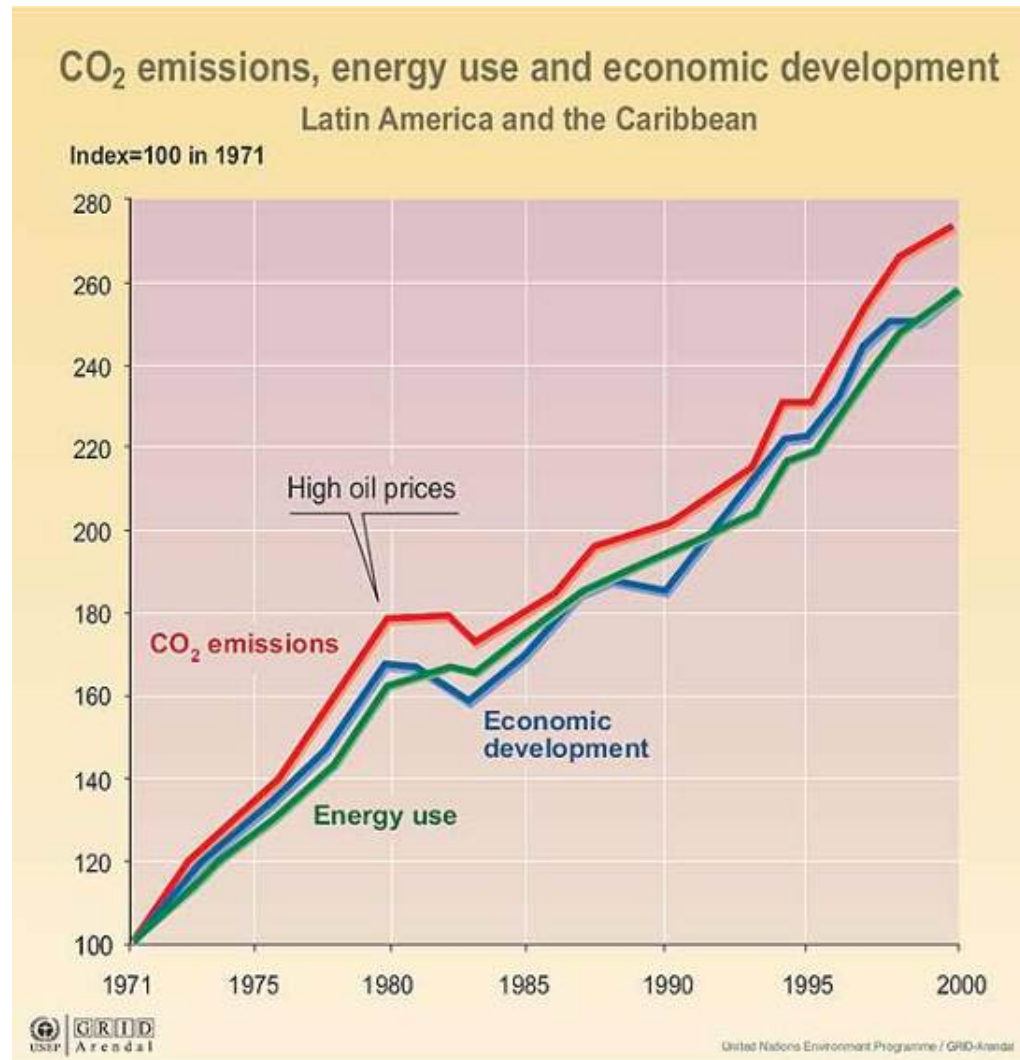
Summary – Variety of concerns pertaining to the energy sector in LAC



- LAC Countries face wide variety of concerns:
 - ◆ Energy resource supply/security
 - ◆ High energy price/import costs
 - ◆ Rural poverty/urban migration
 - ◆ Urban/household pollution
 - ◆ Climate change vulnerability/adaptation
 - ◆ Climate change mitigation pressures
 - ◆ Energy resource management
 - ◆ ALL can benefit from energy efficiency/savings
- Summary of key challenges:
 - ◆ **ECONOMIC DEVELOPMENT AND ENERGY SECURITY**



Comparison between Energy use and Economic Development



Source: World Resources Institute



Overview of the Energy Sector in LAC



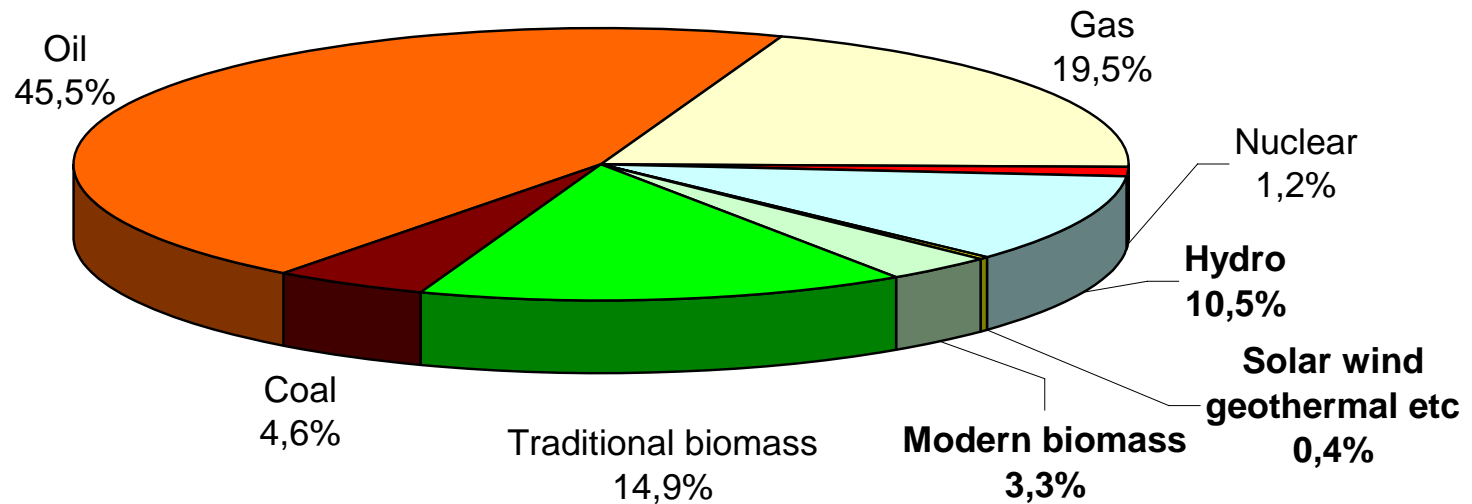
- LAC primary energy growth rate 2002-2003: 3.11% per year (OLADE)
- During this decade, LAC will require a 50% increase in its installed capacity, more than 90GW
- Approximately 10% of the total population in LAC does not have access to electricity ~50 million people (Between 20% and 90% of the rural population in LAC does not have access to electricity)



Overview of the Energy Sector in LAC



Latin America and Caribbean, 2003
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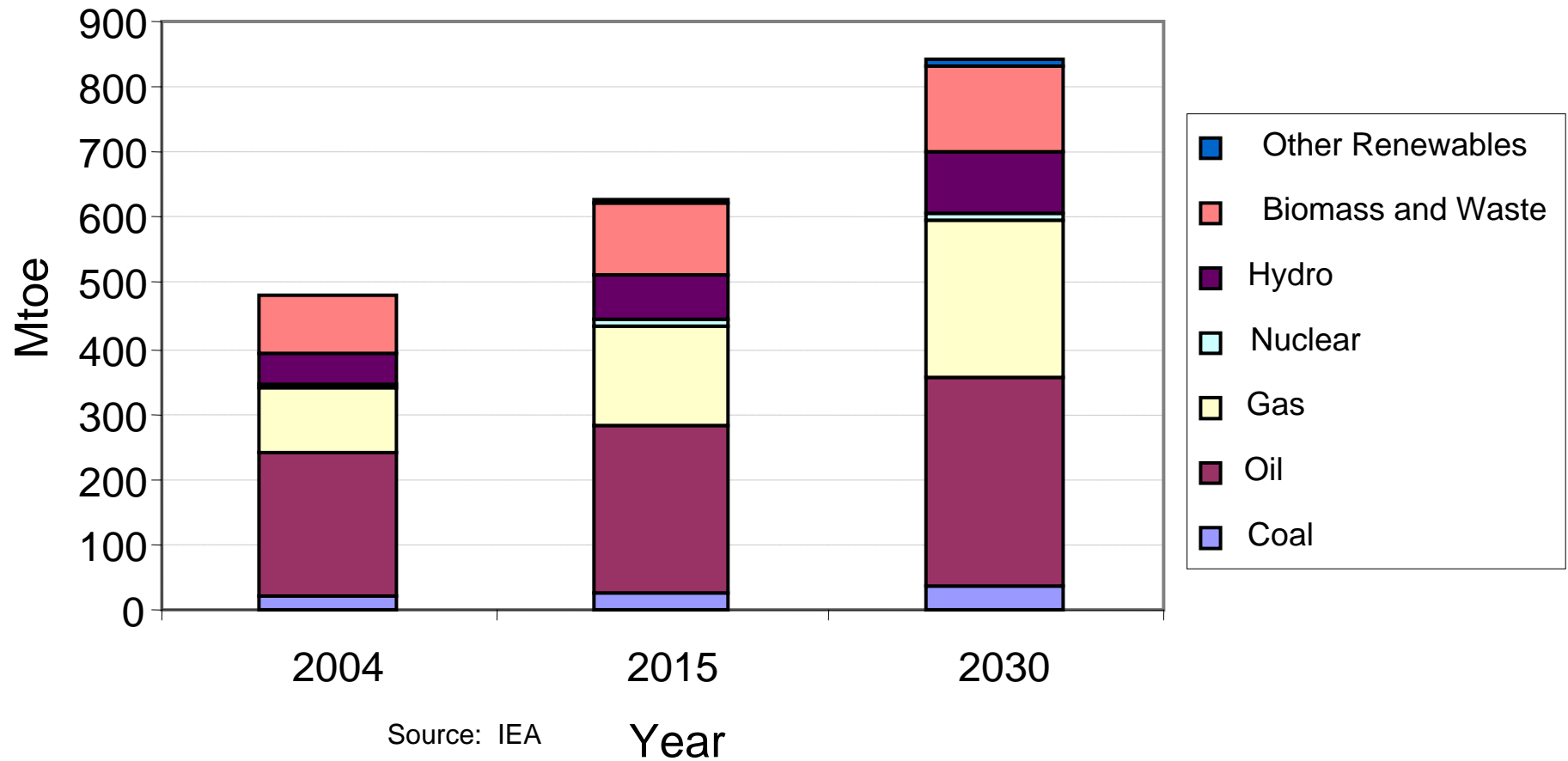




Overview of the Energy Sector in LAC



Energy Demand in LAC (excluding Mexico), 2004 - 2030





Principal Characteristics of the Electricity Sector in LAC - Supply and Demand



- Generalizations regarding the generation of electricity in LAC
 - ◆ **Latin America:** Electricity generation dominated by large scale hydropower, natural gas, and oil/diesel
 - ◆ **Caribbean:** Almost exclusively oil/diesel generator (imported oil)

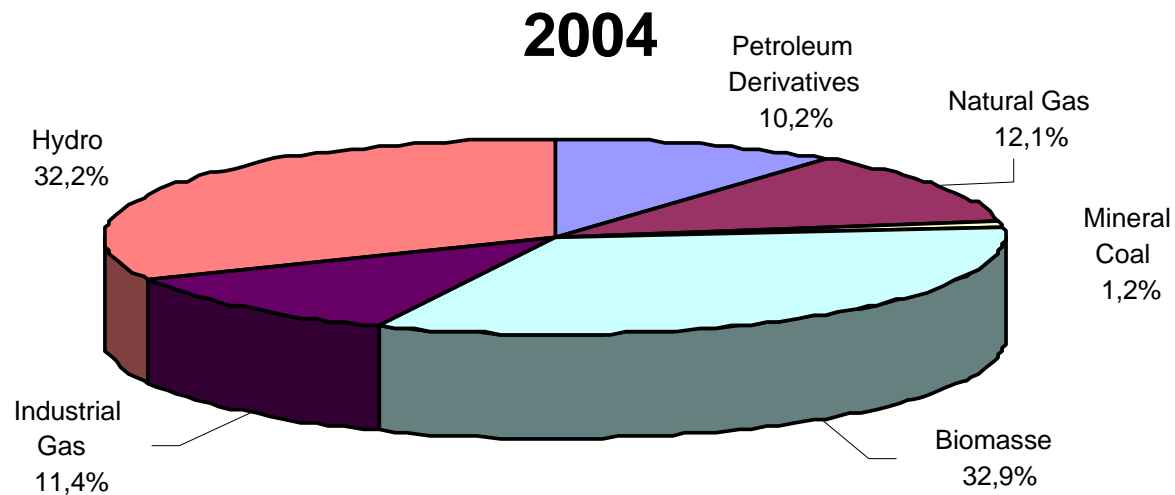




Electricity Overview: Brazil



Percentage of Electricity Generation per source



Total Electricity Generation 37912 GWh (2004)

Source: Ministry of Energy and Mines



Electricity Overview: Mexico



Mexico: Capacity by Source (MW)

Year	Thermal	Hydro	Nuclear	Geothermal	Wind	Total
July 2006	22,673	10,521	1,365	959.500	2.175	35,520.675*

Source: Energy Information System SENER.

*Does not include 8,700.900 MW generated by external producers without specifying the source of generation.



Electricity Generation Portfolio: Central America



Installed Capacity in Central America (MW)

	Total	Hydro	Geothermal	Vapor	Diesel	Gas	Coal	Cogener	Wind
Region	8870.1	3797.3	427.4	622.4	1983.1	1406.1	142	423.2	68.6
Costa Rica	1961.1	1303.6	165.7	0.0	51.5	344.0	0.0	27.7	68.6
El Salvador	1197.9	442.0	151.2	0.0	225.7	318.0	0.0	61.0	0.0
Guatemala	1999.1	639.7	33.0	53.0	399.4	549.3	142.0	182.7	0.0
Honduras	1386.9	474.9	0.0	0.0	809.0	73.0	0.0	30.0	0.0
Nicaragua	742.2	104.4	77.5	169.4	190.1	79.0	0.0	121.8	0.0
Panama	1582.9	832.7	0.0	400.0	307.4	42.8	0.0	0.0	0.0

Source: Economic Commission for Latin America and the Caribbean – ECLAC: *Istmo Centroamericano: Resumen de la Estadística Eléctrica*, Data updated in 2004, Mexico, September 2005.



Electricity Generation Portfolio: Caribbean



Installed Capacity in the Caribbean (MW)

Country	Thermal	Hydro	TOTAL
Barbados	210	0	210
Cuba	3,901	57	3959
Dominica	14	8	22
Dominican Republic	4,184	542	4726
Grenada	32	0	32
Haiti	181	63	244
Jamaica*	1,325	24	1349
Saint Lucia	57	0	57
Trinidad and Tobago	1,416	0	1416
TOTAL	11,320	694	12014

Source: Energy Information Administration (EIA), 2004

*Wind: Jamaica accounts for 20 MW



Electricity Generation Portfolio: Dominican Republic



- Over 80% of electricity and almost 100% of transportation relies on imported fuels (approximately 54.32 M barrels per year).
- High cost of electricity due to high costs of petroleum (consumer price is US\$ 0.2586/KWh).
- Limited connectivity:
 - ◆ Only 66% has access to electricity in rural areas.
 - ◆ Only 60% of total population of 8.5 M is legally connected.



Electricity Market Policies – Regional generalizations



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- ◆ **Latin America:** “Competitive markets” unbundled G, T and D; Independent Power Producers (IPPs); Power Purchase Agreements (PPAs); and Spot Markets
 - ◆ **Caribbean:** Vertical Monopolies, Electricity policies guarantee rate of return for utilities.



Strategies to Address Energy Security and Development Challenges



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- **Energy resources diversification**
 - **Interconnections/Cooperation
between countries**
 - **Energy savings**



Strategies to Address Energy Security and Development Challenges



- **Energy resources diversification**
 - ◆ Expand portfolio of electricity fuels/resources (renewables, fossil fuels, nuclear)
 - ◆ Diversify transportation fuel options (i.e. biofuels Brazil; hybrid vehicles USA)
 - ◆ Diversify sources of fossil fuel supplies





Strategies to Address Energy Security and Development Challenges



■ Interconnections/Cooperation among countries

- ◆ Link power grids (i.e. SIEPAC in Central America; US-Mexico; South American interconnections)
- ◆ Link fuel supply lines (i.e. Natural gas pipelines Bolivia/Brazil/Argentina; PetroCaribe “virtual connection”)
- ◆ Harmonization of policies, regulations, codes & standards





Strategies to Address Energy Security and Development Challenges



■ Energy Savings

- ◆ Demand Side Management (DSM) Programs (i.e. Mexico's CONAE/FIDE)



- ◆ Commercial efficiency programs (i.e. Caribbean Hotel Association Efficiency Program)



- ◆ Improve transportation systems (roads, public transport, efficiency standards)



Electricity Market Policies – Renewable Energy Policies



- Brazil – PROINFA: 3.3 GW of RE [biomasse, small scale hydro and wind (1,100MW each)]; and special RE investment fund
- Argentina – Law regulating and promoting biofuels. Creates institutional framework and establishes a 5% mix of biofuel or bioethanol
- Chile – 2006 Government program to increase RE electricity generation by 15% before 2010



Electricity Market Policies – Renewable Energy Policies



- Mexico: In December 2005 the lower chamber approved the renewables law (LAFRE); Goal 2012 - 12% of generation nationwide.
- Guatemala: RE Incentive Law (2003)
- St. Lucia: Sustainable Energy Plan
- Barbados: Solar hot water heating tax incentives



OAS/DSD Sustainable Energy Programs (Renewable Energy in the America – REIA)



- **Sustainable Energy Policy Assistance**
- **Renewable Energy Technical/Resource Assistance**
- **Information/knowledge management & hemispheric energy partnerships**
- **Increase Access to Sources of Financing**



OAS/DSD Sustainable Energy Programs (Renewable Energy in the America – REIA)



◆ Sustainable Energy Policy Assistance

- ☞ Sustainable Energy Policy Initiative (Capacity building)
- ☞ Guatemala Renewable Energy Incentive Law
- ☞ Sustainable Energy Plans (St. Lucia, Dominica, St. Kitts & Nevis, Grenada)
- ☞ Mexico (RE regulations)



OAS/DSD Sustainable Energy Programs (Renewable Energy in the America – REIA)



◆ Renewable Energy Technical/Resource Assistance

- ☞ Bio-Energy Feasibility Study (St. Kitts & Nevis)
- ☞ Caribbean Basin Bioenergy Initiative (concept)
- ☞ Eastern Caribbean Geothermal Development Project (Dominica, St. Lucia, St. Kitts & Nevis)
- ☞ Rural Schools Electrification Program [link to FEMCIDI] (Honduras, El Salvador, Guatemala)
- ☞ Andean Region Geothermal Workshop (Chile, Argentina, Bolivia, Peru, Ecuador)
- ☞ Solar and Wind Energy Resource Assessment (Central America – UNEP)



OAS/DSD Sustainable Energy Programs (Renewable Energy in the America – REIA)



◆ Knowledge/Information Management & Hemispheric Energy Partnerships

- Renewable Energy and Energy Efficiency Partnership (REEEP) – OAS/DSD serves as LAC Technical Secretariat
- Global Village Energy Partnership (GVEP) – OAS/DSD organized hemispheric conference and provides TA



OAS/DSD Sustainable Energy Programs (Renewable Energy in the America – REIA)



◆ Increase Access to Sources of Financing

- ☞ Cooperate with the IADB Sustainable Energy Financing Initiative
- ☞ Facilitate access to the Global Environment Facility (GEF) and the World Bank
- ☞ Technical Assistance in issues relating to climate change/Clean Development Mechanism (CDM) tools



OAS General Assembly – Panama, 2007



- Special Theme: Energy
 - ◆ Declaration
 - ☞ Key Themes of the Initial Draft
 - ◆ Private Sector Forum of the Americas
 - ☞ High level experts from the private, public and multilateral sector
- Next Steps



Thank you!



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