



Strategic Perspectives on Energy Security and Sustainability in the Western Hemisphere

Presented by:

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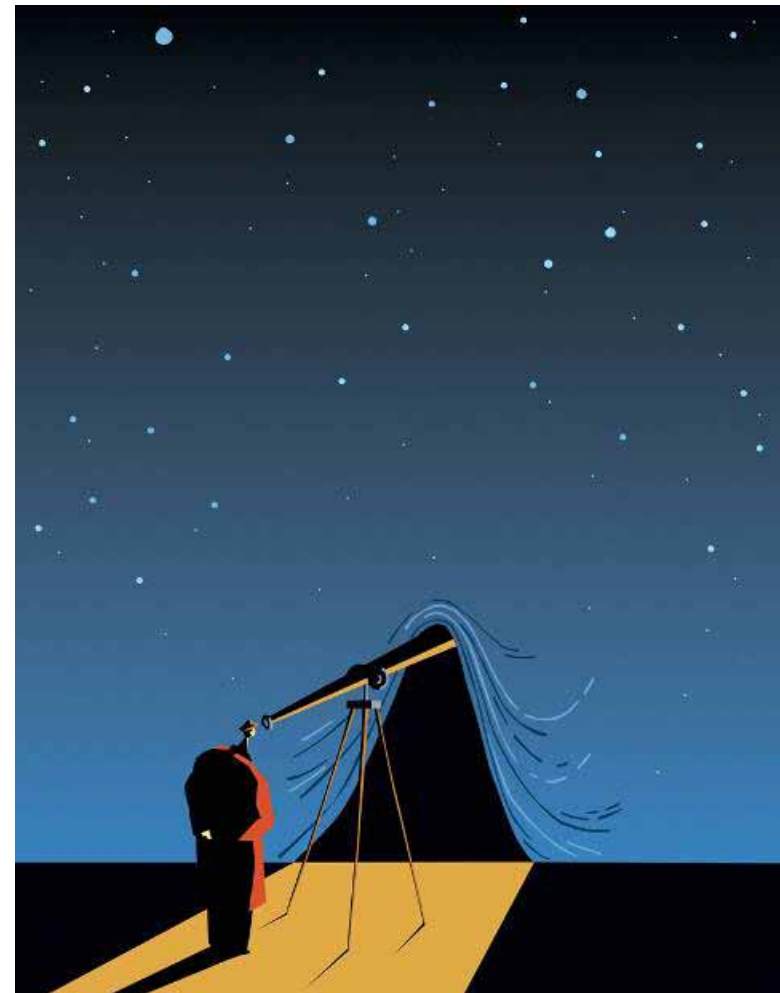
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Agenda

- » **Regional Energy and Emissions**
- » **Regional Policy and Cooperation**
- » **Copenhagen and CDM**
- » **Strategic Perspectives**



Regional Energy & Climate Imperatives

Economic recovery, energy security, and climate imperatives will align regional energy and environmental policies throughout the Americas

- » Energy security and sustainable energy policies stand at the forefront of critical economic and climate recovery policies
- » Energy and commodity price volatility have shaken business and consumer confidence worldwide, and this is true for both consumer and producer nations of the Americas
- » Global credit markets are permanently restructuring, redefining the way investments are made
- » National leaders are serving up unprecedented levels of financial stabilization and short-term fiscal stimulus, including significant investments in energy efficiency and alternative energy supply
- » These short-term solutions must be complemented by long term strategies -- energy security and climate policies will be central to long-term economic strategy and will increasingly be integrated under the concept of sustainable energy strategy

Energy Security + Climate Change → Sustainable Energy Strategies

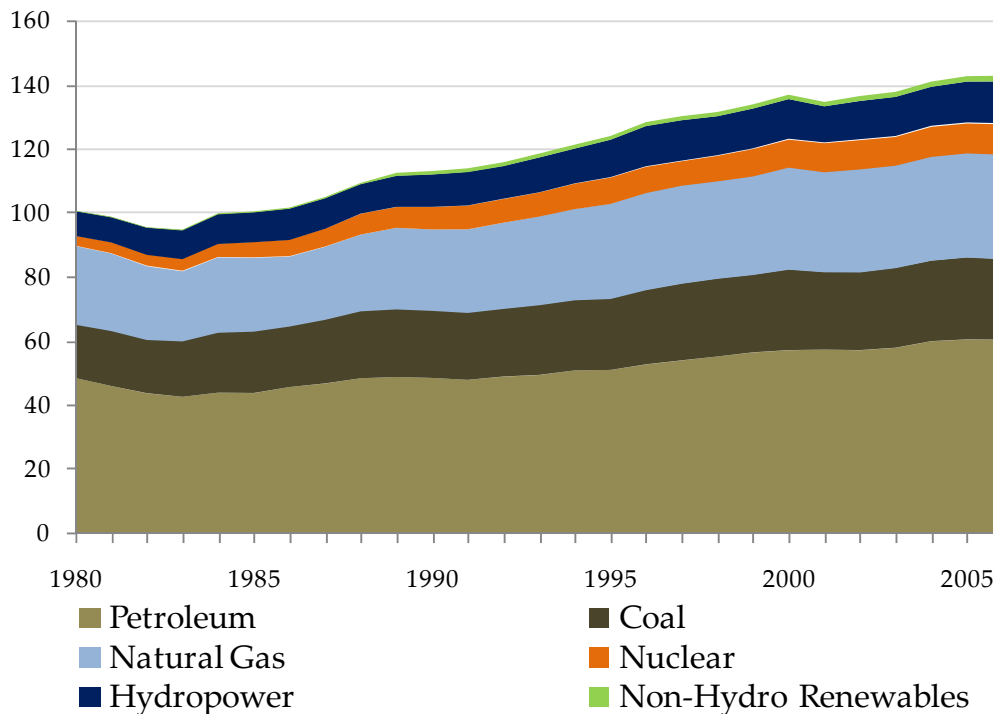
Sustainable Energy Strategies → Regional Integration + Energy Efficiency + Alternative Energy

Regional Oil and Coal Dependency

The Americas depend upon petroleum and coal for over 60% of total primary energy despite increased usage of natural gas -- now 23%. Carbon friendly nuclear, hydro, and renewable energy now represent only 17%

Americas Primary Energy Consumption

(Quadrillion Btu/Year)

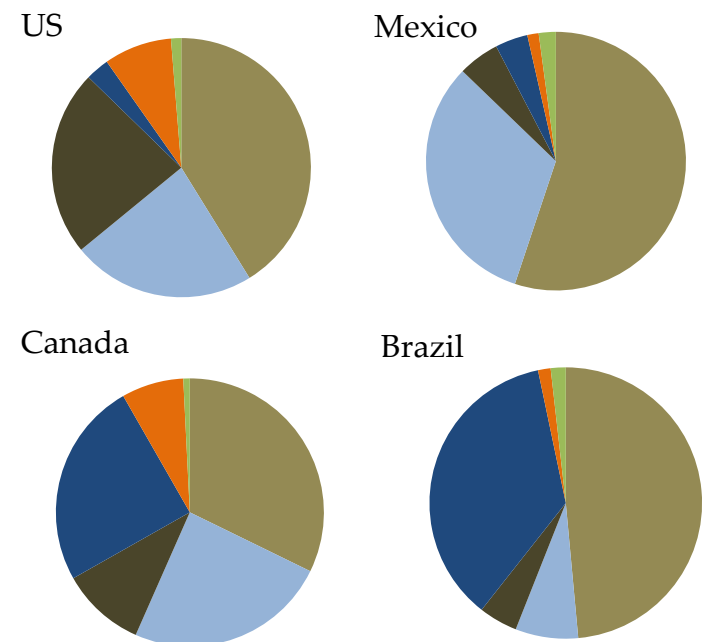


Source: EIA

Primary Energy Consumption

Selected Countries, 2006

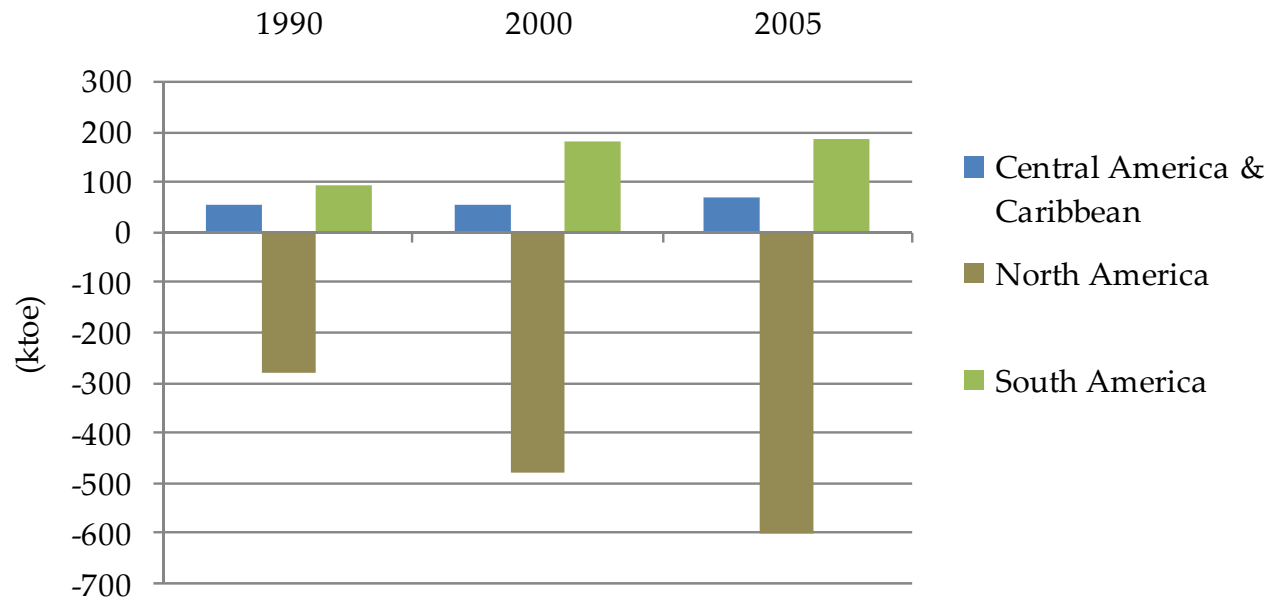
(Quadrillion Btu/Year)



North-South Fossil Fuel Trade Balances

North American petroleum product imports keep growing, but South American and Caribbean exports have not kept pace

Fossil Fuels* Trade Balance by Region



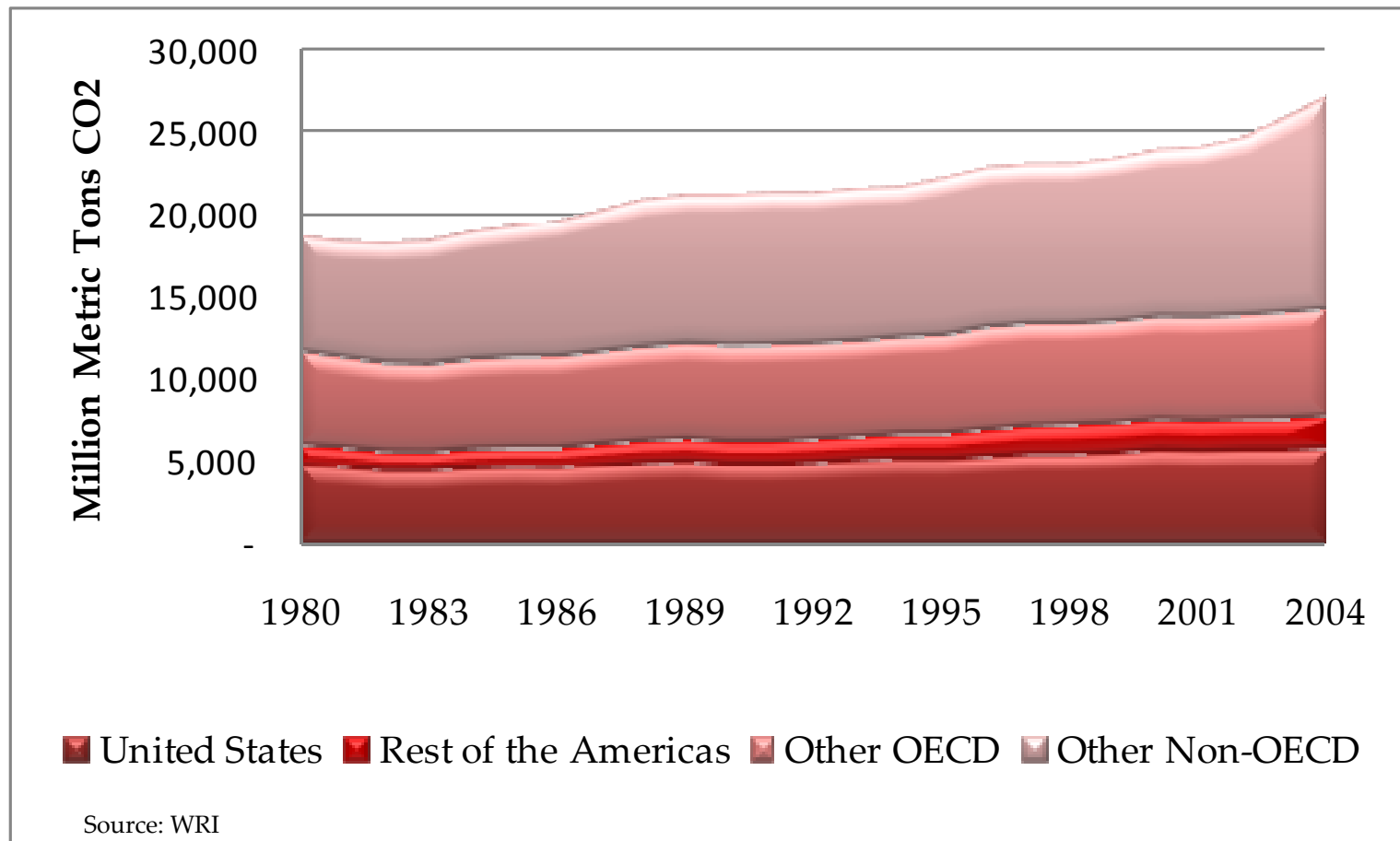
- » Only 15% of US petroleum product imports come from South America
- » Only 3% of US imports come from Central America and the Caribbean, primarily from Trinidad & Tobago
- » The US has missed opportunities to curtail consumption to reduce demand
- » South America has missed opportunities to do the same to free up fuel production for export

Source: OECD/IEA

* Fossil Fuels include coal, petroleum, and natural gas

Regional CO2 Emissions in Global Perspective

Outside the US, the Americas have historically been a limited contributor to global carbon dioxide (CO2) emissions



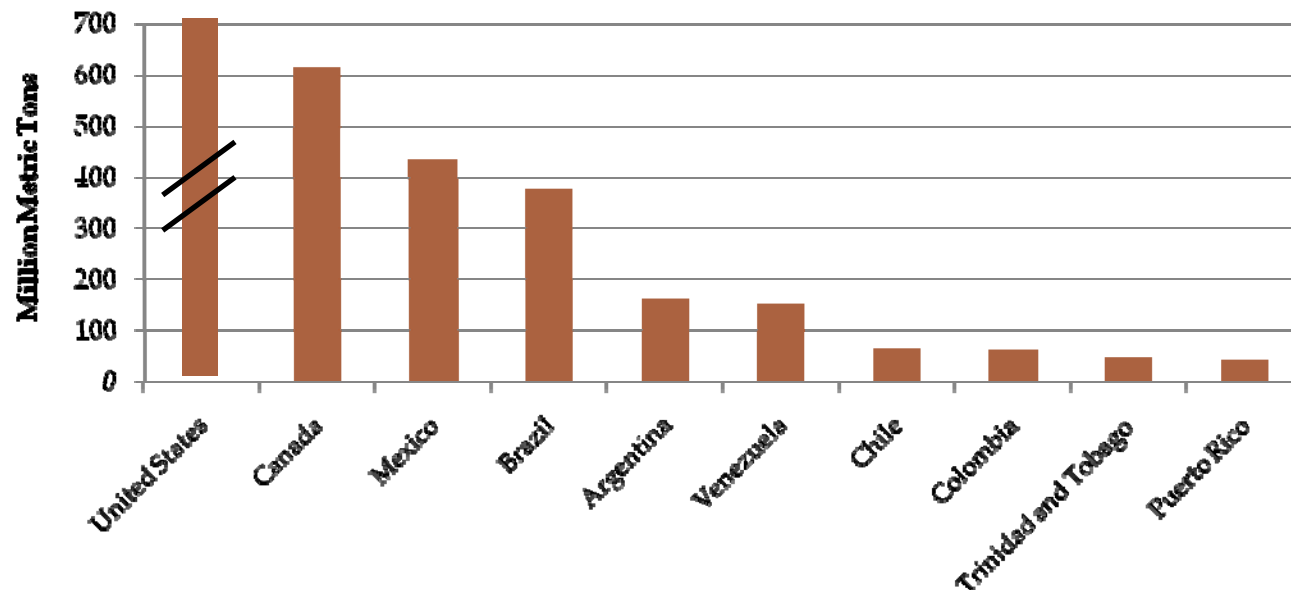
Regional CO2 Emissions in Comparative Scale

On a gross basis, US CO2 emissions are approximately 4 times greater than the other 3 top 4 emitters combined

- » Canada, Mexico, and Brazil are the other top 4 emitters
- » Argentina and Venezuela both have moderate emissions, but all other nations' emissions are small

CO2 Emissions from Fossil Fuel Consumption* for the 10 largest Emitters in the Americas, 2006

US = 5.9 B tCO₂



Source: EIA

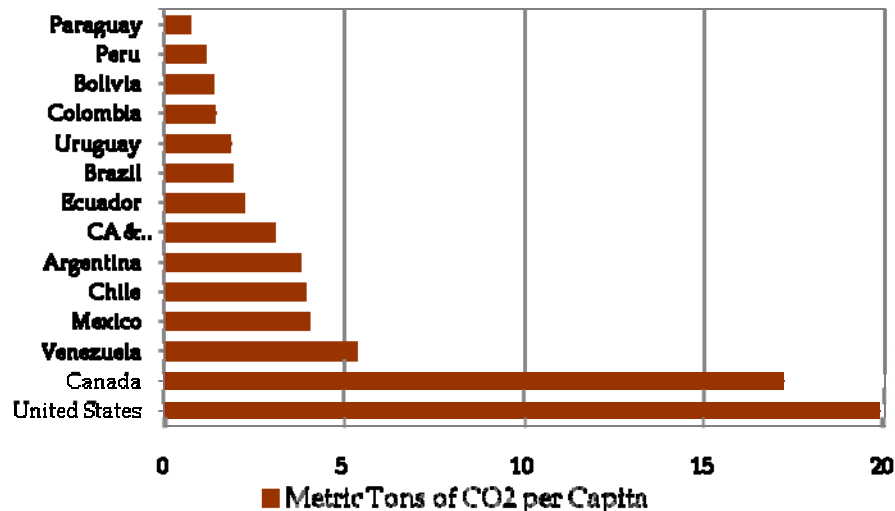
* Fossil Fuel Consumption includes Coal, Petroleum, Natural Gas, and Gas Flaring

Regional CO2 Emissions by Population and GDP

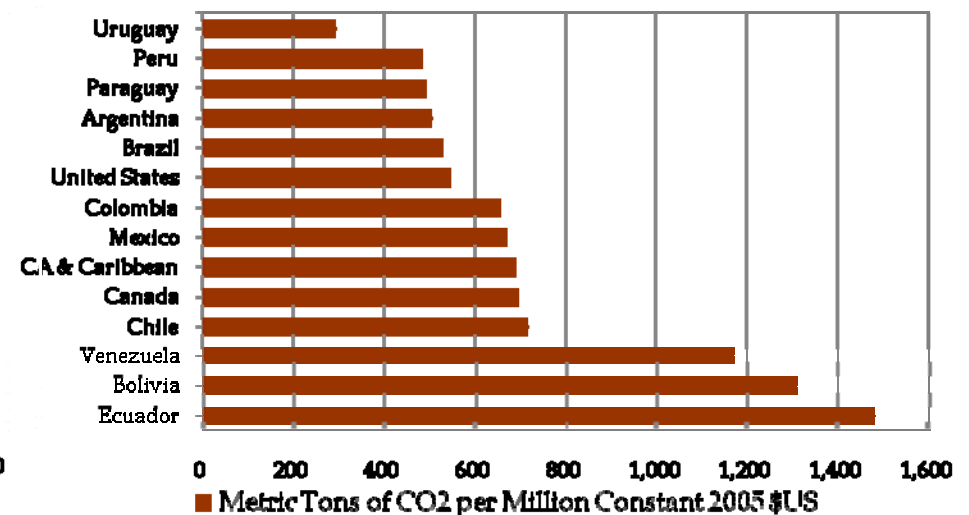
The per capita intensity of carbon emissions (led by the US and Canada) differs greatly from the economic intensity of emissions (led by Ecuador, Bolivia, and Venezuela)

- » Per capita emissions are greatest in US and Canada, with secondary concentrations among Venezuela, Mexico, Chile, and Argentina
- » On a per GDP unit basis, the economic intensity of emissions is greatest in Ecuador, Bolivia, and Venezuela – with secondary intensity in Chile, Canada, CA/Caribbean, Mexico, and Colombia
- » The US, Brazil, Argentina, and other countries are all below 600 tCO₂ per 2005 \$US million of GDP

CO2 Emissions per Capita



CO2 Emissions per unit of GDP, 2004

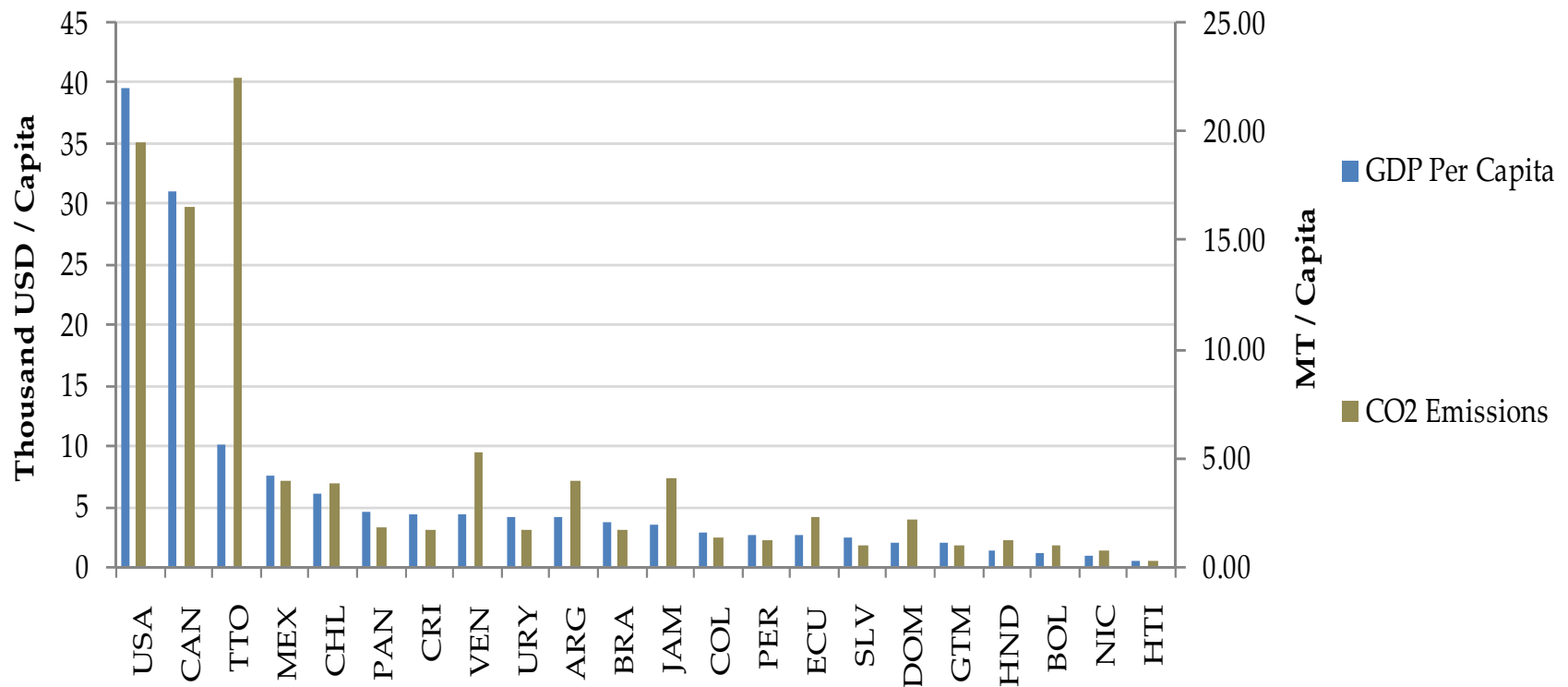


Regional CO2 Emissions vs. GDP Per Capita

The producer nations of Latin America and the Caribbean tend to have high per capita CO2 emissions relative to GDP per capita

- » Trinidad & Tobago, Venezuela, Argentina, Jamaica, Ecuador, and Dominican Republic stand out
- » Large diversified consumer economies such as US, Canada, Mexico, Brazil, and Chile display balance

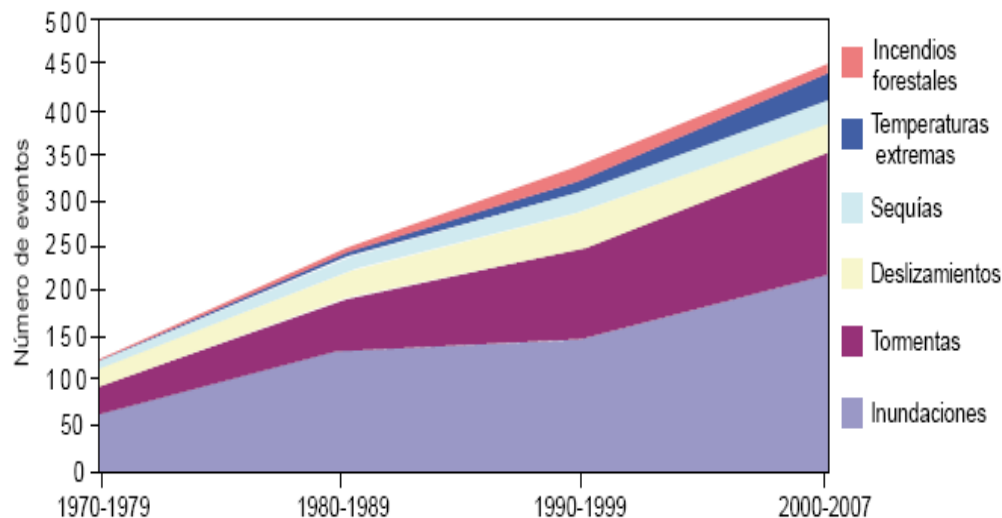
GDP Per Capita Versus CO2 Emissions Per Capita



We Are All In this Together

While Latin American emissions are well below North American and OECD levels, climate change risks and opportunities impact the region significantly

**AMÉRICA LATINA Y EL CARIBE: FRECUENCIA DE FENÓMENOS
HIDROMETEOROLÓGICOS, 1970-2007**



Source: Comisión Económica para América Latina y el Caribe (CEPAL)

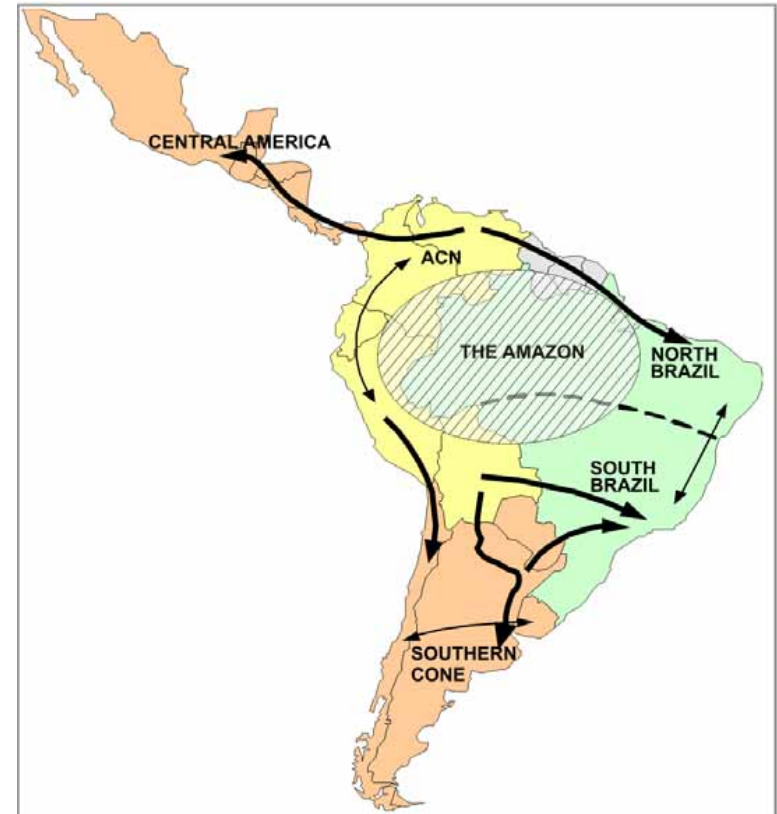
* Such as low-lying coastal areas, areas that are in hurricane zones, areas that depend on ice-melt for water, and areas that are susceptible to fire and floods.

- » Latin America suffers the effects of climate change disproportionately because the several sub-regions are particularly vulnerable.*
- » The region contains rich natural resources, such as the Amazon, that are important global carbon sinks in the international spotlight as solutions to offset emissions
- » The World Bank estimates that up to US \$41 billion/year will be needed to develop mechanisms to lower future emissions and for climate change adaptation to mitigate economic risk and Latin America is fertile ground for this investment

Sustainable Energy Strategy: Infrastructure Integration and Trade

Energy security requires trade and infrastructure integration

- » Regional energy trade and infrastructure integration increases energy supply security and diversity
- » Energy trade and supply diversity are critical to managing energy costs and managing price volatility
- » Trade and supply diversity promote price stability – alternative supply sources provide commercial leverage
- » Regional and sub-regional power transmission and gas pipeline infrastructure projects under study would enhance energy trade in and between:
 - Central America, Andean Community and Mexico
 - Andean Community, Southern Cone, South of Brazil
 - Andean Community, North of Brazil
- Many of these projects will require adequate access to foreign direct investment or FDI



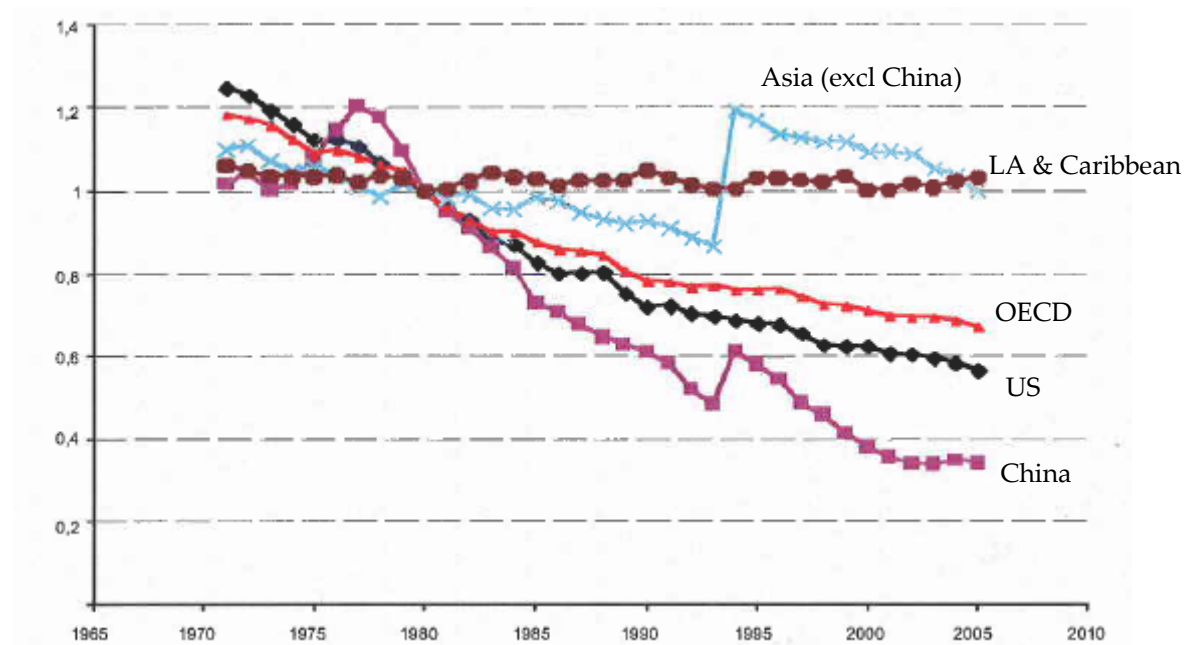
Sources: Regional Energy Integration in Latin America and the Caribbean World Energy Council 2008.

Sustainable Energy Strategy: Enhancing Energy Productivity

Although both developed and emerging economies have reduced energy intensity levels in recent decades, Latin American energy intensity remains stalled at 1980 levels – so the opportunity for improvement is very significant

- » Latin American stagnation may be related to lack of energy efficiency policy in regional economies that are driven by primary industries and natural resource exploitation
- » Regional opportunities for energy efficiency abound in transportation, utility operations, government and commercial buildings, residential buildings, and appliance standards

Energy Intensity Trend, 1980 - 2005



Source: CEPAL, Climate Change in Latin America and the Caribbean Development brief

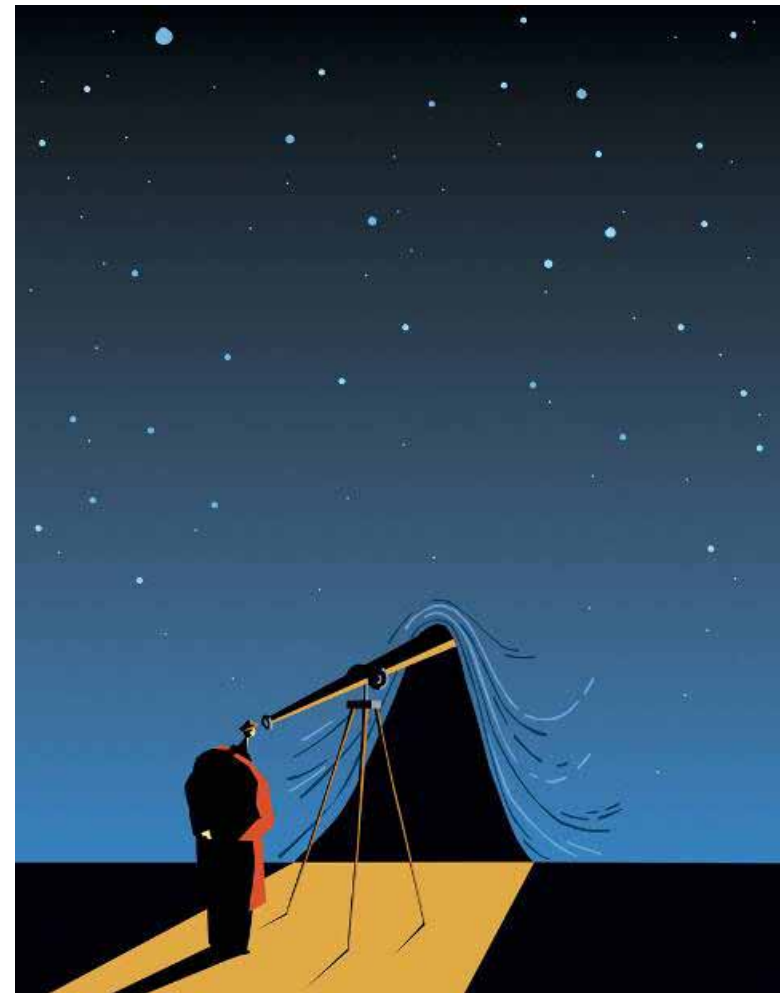
Sustainable Energy Strategy: Implementing Renewable Energy

Renewable energy promotes energy security and sustainability by reducing fuel demand and stabilizing prices – and regional renewable resources are underutilized and abundant

- » Increased renewable energy reduces fuel import dependence and costs, helping consumer nations manage their fuel import costs and producer nations free resources for export
- » Although expensive in the short-run, renewable energy will promote energy price stability in the long-term:
 - » Energy price volatility is driven by hydrocarbon price volatility associated with global economic and geopolitical uncertainties, market transparency, and other factors
 - » Renewable energy will partially decouple energy supply from such volatility
 - » Despite high capital costs for installation, renewable energy supply is a free and reliable resource – although day to day renewable intermittency can cause short term variation and requires backup
- » By softening energy price volatility, renewable energy can help both consumer and producer nations to decrease vulnerability to international energy price shocks and mitigate fuel cost volatility impacts on domestic energy prices
- » Implementation of renewable technologies will require clear, transparent, and supportive policies and regulations to facilitate renewable infrastructure finance and investment

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Where do We Go from Here and Can We Work Together?

Most sustainable energy solutions require international cooperation, but throughout the Americas cooperation is currently in short supply

Collaboration Imperatives

- » North America's large consumer-producer nations will carry a large and costly responsibility for emissions reductions and will seek supply security and price stability
- » Latin American and Caribbean consumer nations are vulnerable to fuel import dependency and climate change impacts and seek supply diversification, price reduction, and, typically, aggressive climate policies
- » Latin American and Caribbean producer nations may prefer high fuel prices, but are also vulnerable to price volatility and need to reduce domestic demand to maximize export volumes
- » *Sustainable Energy Strategies will benefit all constituents, but will require cooperation in the areas of policy coordination, trade and investment*



Seeking Common Ground in Trinidad

Climate change and sustainable energy strategies could become the epoxy needed to cement a new hemispheric energy alliance


- » Conference has been heralded as a success in setting a new hemispheric tone of cooperation
- » Generated optimism that renewed engagement by US in climate change issues alongside significant policy commitments from Mexico, Brazil, and Canada will facilitate a meaningful post-Kyoto agreement in Copenhagen in December

Several initiatives were presented:

- » Energy and Climate Partnership of the Americas - A multilateral pact of voluntary cooperation agreed to by heads of state of Western Hemisphere nations. It aims to address energy and climate change issues. The nations will promote increased energy security and cooperate in their response to climate change.
- » Blueprint for a Sustainable Energy Partnership for the Americas. Presented by the Centre for International Governance Innovation (CIGI), this study concludes that strategic needs of the Western Hemisphere for a sustainable energy future can be achieved through three feasible pathways, and can positively impact socio-economic development of the Americas. These are:
 - » An energy and environment hemispheric research initiative
 - » An agenda for a sustainable Amazon
 - » A new approach to the electricity sector in Central America and the Caribbean

The US and Canada

The US and Canada are both mounting aggressive climate policies

- » President Obama pledged to open “a new chapter in America’s leadership on climate change that will strengthen our security and create millions of new jobs...” and will promote a binding international carbon reduction agreement as a successor treaty to the Kyoto Protocol
- » The President has directed the U.S. EPA to regulate GHG emissions and aims to bring US GHG emissions back to 1990 levels by 2020 and to achieve emissions reductions of 80% by 2050
- » The new federal budget supports a cap and trade scheme where 100% of emissions permits would be auctioned to industry
- »  its way through congress is expected to be approved by December 2009 – carbon content of US imports

- » Oil and gas exports underpin Canadian economic growth in recent years, but domestic gas supplies expected to taper off in 2015-2020 period and oil production will be increasingly dominated by carbon intensive oil sands
- » Canada has been designing an intensity-based cap-and-trade system that it may harmonize with US system when it comes
- » US-Canada clean energy dialogue to collaborate on the development of clean energy science and technologies that will reduce greenhouse gases and combat climate change
- » Large investments in carbon capture and storage and other new technologies



Mexico, Central America, and the Caribbean

Mexico is also mounting an aggressive campaign

- » President Calderon prepared to accept mandatory emissions reductions under the Kyoto successor treaty.
- » Proposes to cut GHG emissions in half by 2050 (versus 2002 baseline) as an “aspirational goal”
- » Promoting voluntary reductions by industry, but studying the launch of a cap and trade carbon market by 2012. Besides meaningful existing programs for wind and efficiency, plans to meet a large portion of reductions through reforestation.
- » Upcoming decision this month for a binding cap on carbon emissions from cement and oil refining



New initiatives are being launched in Central America and the Caribbean

- » Sustainable Energy Framework and Climate Change programs in the Caribbean sponsored by multilaterals and local governments
- » Costa Rica has the initiative “Peace with Nature” – a commitment to achieve “Carbon Neutrality” by 2021
- » Costa Rica’s Environmental Services Payments Program (ESPP) will guarantee the conservation of forests by financially motivating and rewarding forest and plantation owners



South America

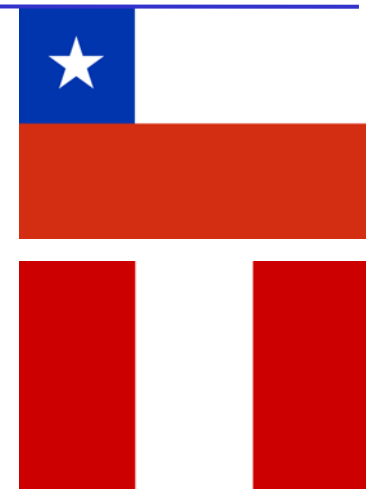
Significant carbon reduction and renewable energy policies are afoot in South America

- » President Lula does not support mandatory caps, but Brazil's National Climate Change Plan aims to reduce the country's GHG emissions by an estimated 70% relative to the 1996-2005 baseline
- » Achieving these targets would avoid 4.8 BMT of CO₂ emissions during 2006-2017 (more than the annual emissions of the EU and Canada combined)
- » Above all, plans to arrest deforestation rate to 5,860 km² kilometers (2,260 mi²) per year by 2018 (down from a baseline of 19,533 km² per year)



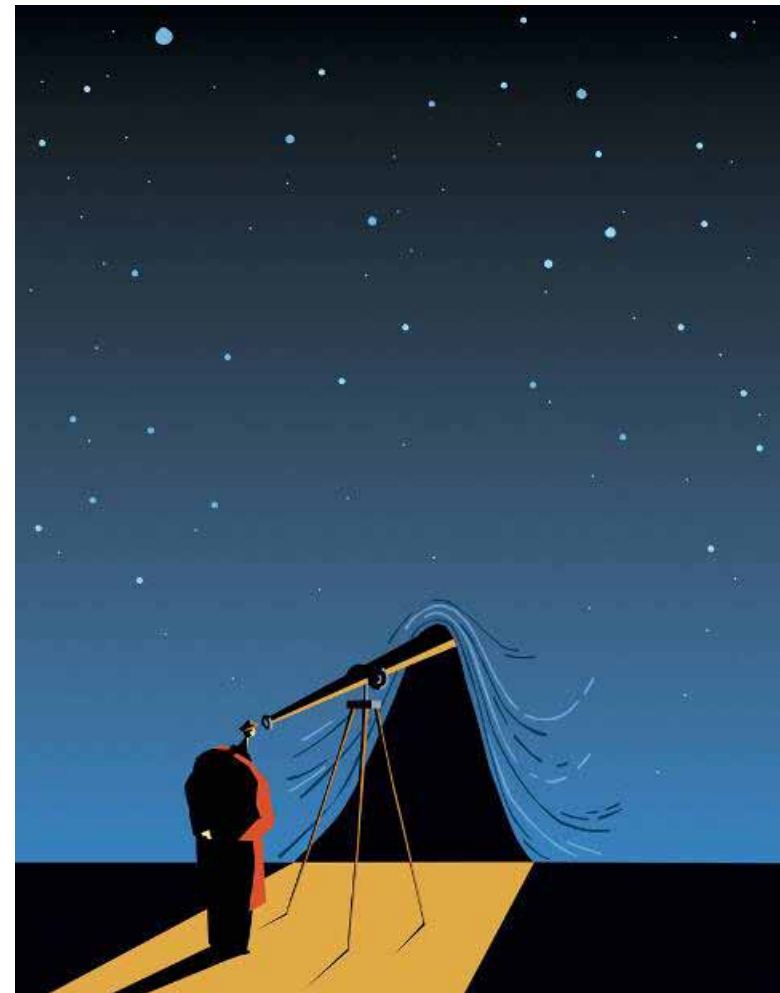
by the Amazon Fund (voluntary contributions from governments, corporations, and individuals who are not eligible for carbon credits)

- » Chile is aggressively pursuing a renewable energy mix, with a solar concentrating plant on the drawing board and new RPS standards
- » In May 2008, Peru established a new environment ministry to address climate change. The nation's new renewable energy law and investment climate have boosted Peru as a CDM project host



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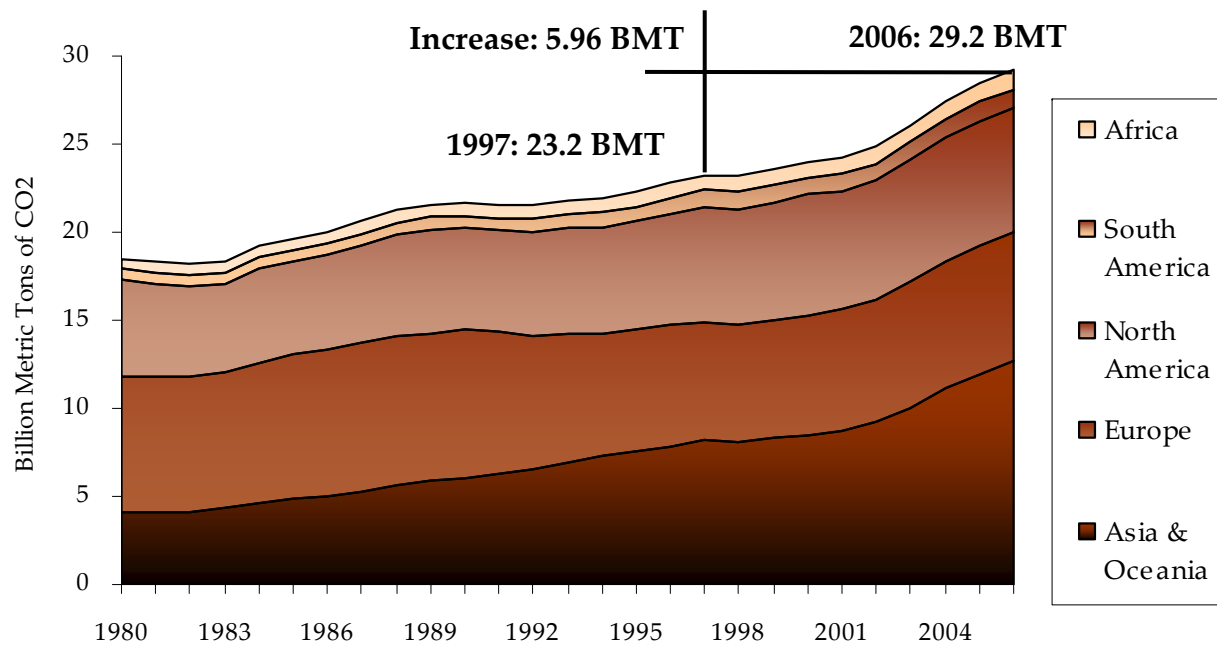
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Kyoto Has Not Worked

In the first decade after the Kyoto Protocol was signed in 1997, global CO2 increased by approximately 25% or 6 billion metric tons – with about 75% of the increase in Asia

- » Since 1980, CO2 emissions in Asia have risen rapidly, North American emissions have risen steadily, and European emissions have declined
 - » In 1980, Asia/Oceania represented a third of combined European and North American emissions
 - » In 2006, Asia/Oceania emitted approximately 90% of the combined European and North American emissions



Source: EIA

The Outlook for Copenhagen

Global coordination may be even harder than regional collaboration

- » The number of regional and national agendas – US, EU, Chinese, large emerging market, and other developing country – at the table in Copenhagen may be too disparate to align behind a single global policy solution
- » CDM mechanisms have not been as effective as desired for changing investment patterns in the energy sector. New agreements are needed to create an investment regime that fosters diffusion and development of clean technology, while also bolstering competitiveness of the sector
- » After 2012, the Kyoto successor agreement will be central but will probably be supported by a system of global bilateral treaties that align regional interests behind common goals and solutions:
 - » The post-2012 EU system will be a fundamental subsystem
 - » A new U.S. – China GHG agreement could be a critical addition as these are the largest emitters
 - » Similarly, the emerging GHG commitments from the US, Mexico, Brazil, and other nations could lead to new hemispheric agreements on regional GHG and energy imperatives

Improving CDM in Copenhagen

Several options to improve and expand CDM after 2012 have been advanced at Poznan in 2008 and may be on the table in Copenhagen in 2009

Proposals to Scale Up CDM and Related Financial Flows to Developing Countries

- » **Programmatic CDM:** Would reorient CDM focus on away from infrastructure projects toward programs that could produce significant long-term benefits place less emphasis on strict ton-for-ton accounting by providing credits to a public or private organization that coordinates an array of small projects
- » **Policy CDM:** Would change the CDM to allocate credits to nations that adopt and implement policies that are “additional” and generate verifiable carbon reductions
- » **Sectoral CDM:** Would expanding the coverage of the CDM from specific projects to an entire industry, such as the power sector, by providing credits to businesses or governments for reducing sectoral emissions below a pre-determined industry standard emissions level

Proposal to Stimulate “Clean” Technology Transfer to Developing Countries

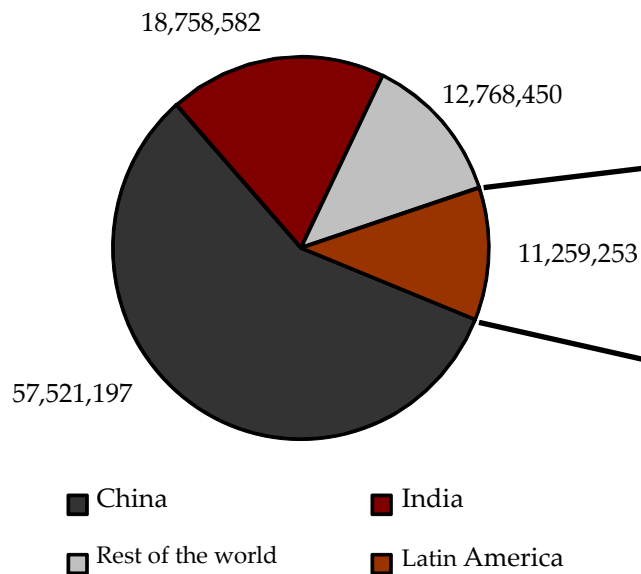
- » **Technology CDM:** Would focus on using credits to stimulate “clean” technology transfer to developing countries by allocating credits that may be shared between the technology providers and/or host governments. Only projects using technology transferred under the program would receive credits

CDM in Latin America

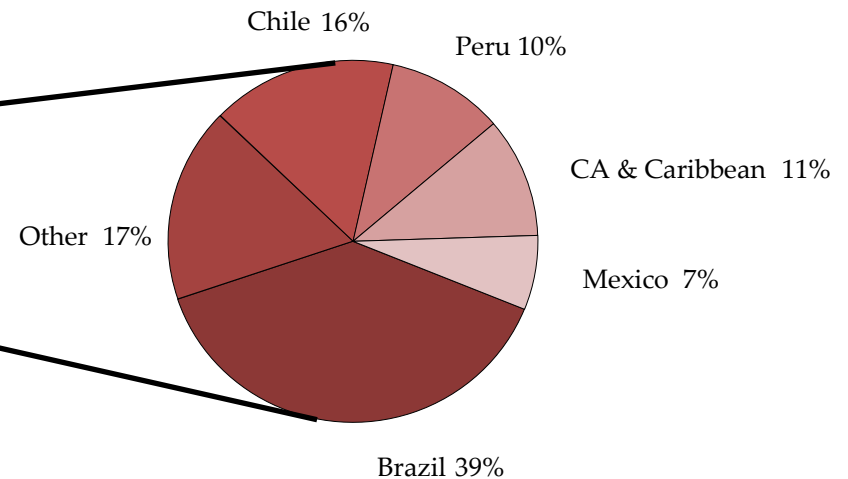
Latin American energy sector utilization of the UNFCCC's CDM incentives represents only 11% of worldwide utilization and is dwarfed by China and India

- » Latin American registered CDM projects totaled 11% of the worldwide registrations of 100.3 million tCO₂e as of January 2009
- » Within Latin America, Brazil represents 40% of regional registrations, followed by Chile, Peru, and Mexico

Energy Sector CDM by Region (tCO₂e)



Energy Sector CDM Latin America (tCO₂e)



Source: UNFCCC

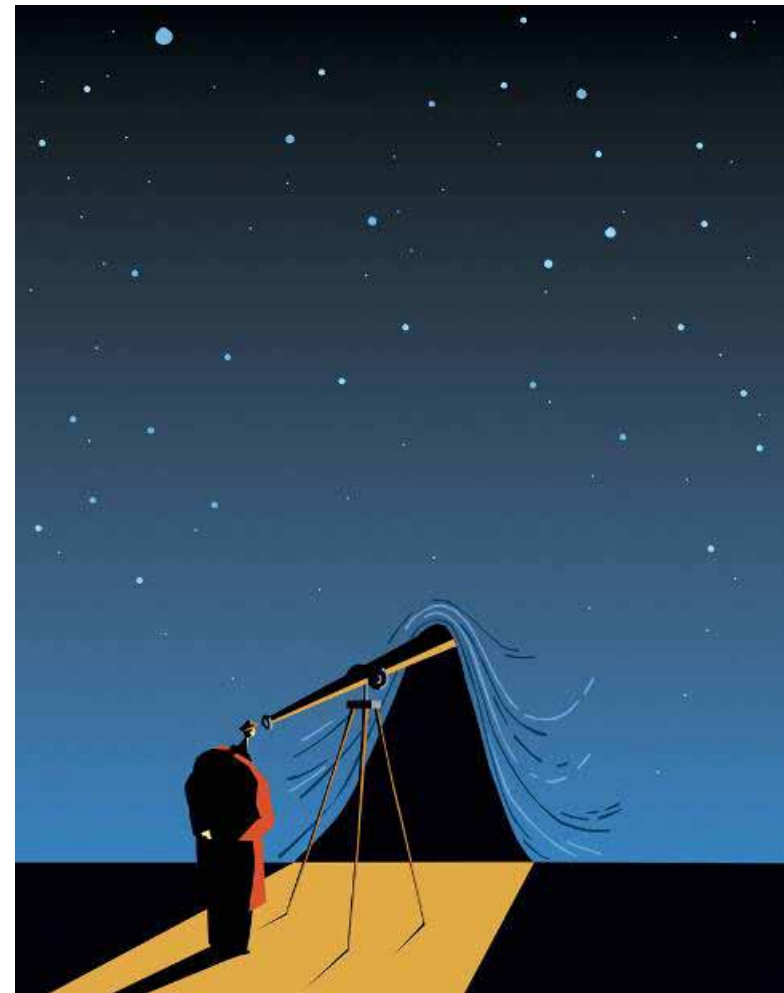
Enhancing CDM to Support Renewables

Assuming the continuation of CDM beyond 2012, improving the regulatory and economic fundamentals for renewable energy should be a hemispheric priority

- » CDM alone is not adequate to stimulate large scale development of alternative energy resources -- CDM is not the “main dish” but rather the “desert”
- » Throughout the Americas, renewable energy development confronts several fundamental challenges:
 - » Lack of clear, transparent, and enduring regulatory structures that support renewable energy development over the long-term
 - » Least cost procurement requirements or market structures that require small scale renewable projects to compete on an equal economic basis with large-scale thermal and hydro-electric generation – without regard to environmental “costs” or “additionality” in national energy policy
 - » Examples include CFE’s least cost generation resource obligations in Mexico, and Brazilian wholesale markets and power auction structures (prior to the new wind auctions)
- » Given these challenges, project financing and capital market enthusiasm for Latin American renewable energy projects has been soft – and the current global credit crisis does not help

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Putting It All Together

Throughout the Americas, the climate risks and benefits of sustainable energy strategies are significant

- » Oil and coal still represent the majority of regional primary energy supply and both consumer and producer nations are vulnerable to energy commodity price volatility
- » Regional economies and populations are quite vulnerable to climate change impacts
- » Energy security and climate change imperatives and solutions are linked:
 - » Regional infrastructure and trade integration are central to supply diversification and price stability
 - » The integration of alternative energy supply will promote price stability, reduce fuel import dependency, and free hydrocarbon resources for export
 - » Latin American energy productivity has stagnated and demand reduction opportunities abound
- » Although currently in short supply, international and hemispheric cooperation are at a premium and will increase
- » Now is the time for government and corporate executives to define and prepare for the new rules of engagement in a sustainable energy future

