The Centre for International Governance Innovation
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Blueprint for a Sustainable Energy Partnership for the Americas

Project Report

Summary

The theme chosen for the Fifth Summit of the Americas, "Securing our Citizens' Future by Promoting Human Prosperity, Energy Security and Environmental Sustainability," offers an auspicious opportunity to rekindle cooperation among the 34 countries in the hemisphere whose leaders gather in Port-of-Spain, Trinidad and Tobago, on April 17-19, 2009.

This report identifies opportunities to lay the groundwork for the development of concrete initiatives to address the strategic needs of the Western Hemisphere for a sustainable energy future:

1. An energy and environment hemispheric research initiative
2. An agenda for a sustainable Amazon
3. A new approach to the electricity sector in Central America and the Caribbean

All three proposals open the way to initiatives that are timely, relevant, politically and economically feasible, and carry the potential to have a strong and significant impact on the sustainable socio-economic development of the Americas.

About this Project

Four hemispheric organizations are collaborating to produce this blueprint for a lasting sustainable energy partnership for the Americas: The Centre for International Governance Innovation (CIGI) located in Waterloo, Canada; the Council on Foreign Relations (CFR) in New York, US; The Brazilian Centre for International Relations (CEBRI), in Rio de Janeiro, Brazil; and the Institute of International Relations at the University of the West Indies (IIR UWI) in St. Augustine, Trinidad. The project has involved extensive consultation with individuals from policy, business, government and civil society sectors over the course of three workshops beginning in November 2008.

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Introduction

When the leaders of 34 Western Hemisphere countries gather in Trinidad and Tobago for the Fifth Summit of the Americas, they will have the opportunity to promote a commitment to cooperation throughout the hemisphere. The theme chosen for their discussions, "Securing our Citizens' Future by Promoting Human Prosperity, Energy Security and Environmental Sustainability," is an auspicious foundation on which to build such cooperation. These issues are of utmost relevance to everyone in the Americas, energy producers and consumers alike. Early in US President Barack Obama's presidential campaign, he singled out energy security and climate change as vital issues for the hemisphere. In his words, ". . . while we share this risk, we also share the resources to do something about it. That's why I'll bring together countries of the region in a new Energy Partnership for the Americas . . . Together we can forge a path toward sustainable growth and clean energy" (Obama, 2008). Senator Hillary Clinton reasserted the new administration's commitment to energy cooperation in her confirmation speech as secretary of state, adding that such a partnership would be built "around shared technology and new investments in renewable energy" (Clinton, 2009: 10).

These laudable objectives are shared by many countries in the hemisphere. Nevertheless, developing a truly sustainable energy partnership is an ambitious endeavour requiring innovative and multidisciplinary thinking, a deep understanding of the region – its rich history and current predicament – and a substantial dialogue and exchange of ideas throughout the Americas. An effective partnership will need to address the strategic needs of each participating country.

Key strategic considerations

The Blueprint partners have sought to define pathways capable of delivering solutions to many issues, including but not limited to:

- the appropriate energy mix for the different countries in the hemisphere;
- the role and opportunities for energy conservation and improved efficiency;
- the infrastructure and technology necessary to boost output and delivery, and reduce environmental impact;
- the particulars of the public-private alliances and interactions needed to fulfill integration objectives;
- the challenges of addressing the environmental agenda while delivering economic development alongside greater energy production; and
- the role of domestic agencies and international institutions in the governance of the many aspects of a formalized partnership.

The project is designed to identify pathways that:

- address the strategic needs of at least a group of countries;
- ensure that opportunities for leadership are offered to various countries and/or regions; and
- identify areas for collaboration with minimal potential for controversy and conflict.

The framework and criteria for the project were developed through a series of workshops held at IIR UWI, CEBRI and CFR. After careful consideration of the issues raised and the assembled experts' advice, three specific concepts were identified as being feasible, highly relevant, and potentially groundbreaking in their impacts:

- 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

Each pathway provides the opportunity to incorporate relevant domestic agendas, challenge the status quo, strengthen cooperation and move the hemisphere toward a sustainable energy partnership.

1 PATHWAY: An energy and environment hemispheric research initiative

Developing the necessary technology to make the production of hydrocarbons sustainable and the use of renewable energy alternatives commercially viable is a major challenge for many governments in the region. However, the current approach to government research investment benefits single companies as opposed to entire sectors, slows down adoption of new technologies, and makes collaboration extremely difficult. It is a model of technology transfers as opposed to joint technology development. An alternative approach should be considered. The US and Canada can invite other like-minded countries to participate in an energy and environment research initiative that promotes cooperation in technology development and rapid technology diffusion.

The Issue

There is no doubt that energy and environmental issues will command billions in research dollars from the US and Canadian governments. In fact, both parties have already agreed to start a "Clean Energy Dialogue," which includes discussions of investments in such research. For the most part, however, the conversation has been about technology transfers rather than joint technology development. Earmarked stimulus package funds and other appropriations in both countries prioritize domestic programs. As a result, collaboration on technology development is likely to remain limited.

There are many impediments to cooperation and efficiency in technology development under the current financing models. The greatest problem is that although governments invest heavily in both basic and applied research, as well as in generous loan guarantees during the commercialization phase, they have virtually no rights to successfully developed technologies. Although the US federal government receives non-exclusive, royalty-free licences to intellectual property developed by public-entity grant recipients, the benefits of such licences are limited to government uses. This approach transfers substantial funds from taxpayers to the purses of individual private companies which, in an effort to guard intellectual property rights, may not test their new technologies in the most cost-effective ways. It also slows down the adoption of new technologies. If the technology could be validated economically and efficiently, and then made available at a fair price to many companies simultaneously, diffusion through the system would be much faster and a positive impact made on the environment sooner rather than later.

These issues need to be addressed head on.

Countries successfully develop new technologies and have a variety of models for engagement among various levels of government, academia, and the private sector. At this juncture, however, such success needs to be replicated in a multinational context. A solution to this challenge is to adopt specific features of different models in a combination that responds to the strategic needs, political circumstances and cultures of the hemisphere.

We looked at three specific models. The Alberta Oil Sands Technology and Research Authority (AOSTRA) pioneered technologies whereby a public-private partnership left control of the licenses generated in the hands of the government of Alberta, allowing for faster diffusion as the government made the technology available to all companies for a "fair" price. The second example, relevant for its financing mechanism and licensing innovation – two necessary elements in any research initiative was a project funded by the Bill & Melinda Gates Foundation (Gates Foundation) in association with the Institute for OneWorld Health (iOWH), the University of California, Berkeley (U of C Berkeley) and Amyris Biotechnologies, a U of C Berkeley start-up. The agreements for commercialization of a synthetic malaria drug followed a non-profit business model for drug sales to the developing world, but a for-profit model for all other applications of the synthetic biology platform, including the potentially lucrative field of biofuel production. Finally, the International Energy Agency's (IEA) technology agreements – also known as implementing agreements – provide useful insights into legal frameworks.

Some aspects of these experiences are worth highlighting as indicators of the potential success of a multilateral energy initiative.

AOSTRA

- AOSTRA was an arms-length, government-funded organization that engaged the private sector and the university research community in developing technology related to the oil sands, while the government retained the rights to the technology.
- An endowment allowed AOSTRA to function independently of the electoral cycle. A dedicated expert and respected seven-member board of directors helped secure the private sector's buy-in.
- Before the organization determined its goals, it conducted two years of extensive consultations with many stakeholders. Only after determining exactly where the technology gaps existed did AOSTRA put out a call for proposals.
- Aside from successfully developing new technology, AOSTRA fostered and financed a new generation of academic and scholarly expertise in many aspects of oilsands development. The investment in human resources is often discounted, but has been fundamental for the sector's success in Alberta.
- Overall control by the government helped maintain continuity over downturns in the economic cycle.

Amyris

- The Amyris experience in developing enzymes with applications to many platforms points to technology development aimed at multiple sectors and opens the doors to philanthropy financing.
- Once you widen patent protection, for-profit technology developers make very different choices.

International Energy Agency

- The IEA implementing agreements and the system of standard rules and regulations provide a legal framework that has allowed for cost-cutting solutions and fostered research development and deployment of particular technologies among member and non-member countries and other organizations.

Next Steps

As the countries with widest experience, the United States and Canada should invite others to join them in launching an energy and environment hemispheric research initiative, whereby technology is developed cooperatively between nations and in partnership with the private sector.

A group of scientists, scholars, entrepreneurs and government officials from participating countries should identify the technology gaps and define the focus of the proposed partnership. Participants should contribute equally in finances, expertise and private sector involvement. It is likely that only a subgroup of countries from the region will be either interested or able to participate, at least initially. It is proposed, nonetheless, that the participating governments will retain the licensing rights and they could agree to deploy new technologies throughout the hemisphere on a preferential basis.

2 PATHWAY: An agenda for a sustainable Amazon

There are few regions that bring to light the link between energy and the environment as clearly as the Amazon Basin. Locally, the rivers are potential energy suppliers and provide an alternative transportation system. Farther afield, the Amazon waters and forest impact rain patterns and global temperatures which, in turn, affect water reservoirs, food and biofuels production. The importance of the Amazon rainforest to the global ecosystem cannot be overstated.

The success of any plan for the sustainable development of the Amazon Basin will depend on the buy-in of all Amazon countries; thus it will have to allow for national plans that answer to the specific conditions and strategic needs of individual countries. In fact, the most effective path to success might start with a successful national plan, which can then be shared with others and adapted to local conditions, forming the basis for an effective regional approach. In this case, Brazil has the potential to lead the way.

The Issue

The Amazon Basin stores an estimated twenty times the carbon content of the world's annual greenhouse gas emissions – some 49 billion metric tons of carbon – in the biomass of its tropical forest (Garten Rothkopf, 2009: 41). It plays a crucial role in stabilizing the weather and in the rain patterns of the entire region. Any decrease in the size of the forests has serious global implications. Fortunately, there is still time to halt deforestation. Such action will have a positive impact on the entire planet.

A desire to address this issue led to the creation of the Amazon Cooperation Treaty Organization (ACTO), and has led to the formulation of several plans, including the current Strategic Plan 2004-2012. Nevertheless, a lack of concerted focus on the region's challenges, combined with wide institutional and scientific capacity gaps among the eight participating countries, has made the organization ineffective. Although most Amazon countries have, proportionally, protected larger areas than Brazil, so far Brazil is the only country that collects satellite data on deforestation. The lack of aggregate data and regional monitoring systems have become a crucial impediment to the implementation of ACTO's a Strategic Plan.

If some Amazon countries lack the resources and capacity to address the challenges, Brazil is demonstrating a serious commitment to finding lasting solutions. This is not surprising. Brazil is home to 54 percent of the Amazon Basin and 65 percent of Amazon rainforest, and has the largest population living in the region – 23 million citizens. Deforestation threatens the long-term viability of a dignified life for the Amazon's citizens, as well as the continued existence of precious biodiversity and water resources. In addition, the loss of green cover will have disastrous impacts on rain patterns in Southern Brazil, and directly affects the country's massive agribusiness. These factors combine to make this an issue of intense strategic interest for the country. National interests and sovereignty concerns are key drivers in maintaining a sustainable forest region.

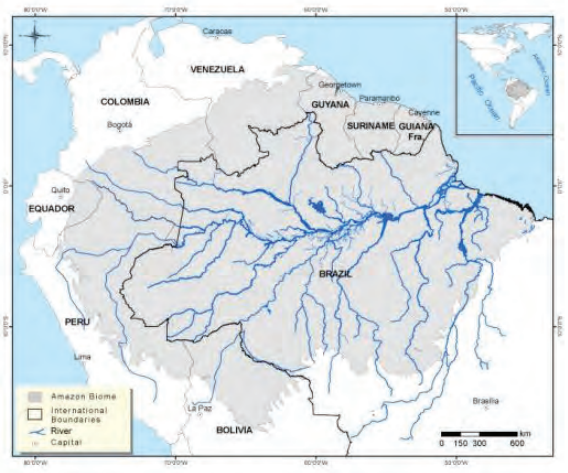
As the largest of the Amazon countries, Brazil must take responsibility for the monumental challenge of implementing an effective sustainability plan and then share its experience with its neighbours, thereby enhancing ACTO's effectiveness. Even though there is a long way to go, it is a task well-matched to Brazil's capacity.

In a world struggling to find mechanisms, policies and technologies capable of delivering sustainable and secure energy sources, Brazil has excelled. Today, renewable resources (an imperfect but useful proxy for clean energy) account for slightly over 45 percent of Brazil's energy mix, vastly greater than the world average of 14 percent.

Examples of Brazil's long-term vision, ingenuity and pragmatism in facing difficult challenges in securing energy sources and increasing their sustainability are not hard to

find. Lacking onshore oil reserves, Brazil has made itself into a world leader in deep water hydrocarbon exploration and production. The oil shortages of the 1970s propelled Brazil to develop an ethanol program, but the survival of the sector was dependent on its ability to become efficient and led to the development of flex-fuel vehicle technology. A need to develop hydroelectricity cemented a partnership with Paraguay in the construction and operation of the Itaipu Dam, to this day the longest operational hydroelectric power plant in the world (Itaipu Binacional, 2009). Itaipu also led to a trilateral agreement with Argentina to ensure equitable management of the shared watershed. A desire for further regional energy integration impelled Petrobras, the Brazilian state-controlled integrated energy company, to make substantial investments in Bolivia and in the Brazil-Bolivia natural gas pipeline. When Bolivia decided to close its hydrocarbon sector, Brazil showed much maturity in dealing with its neighbour and, without hesitation, Petrobras moved rapidly to secure alternative sources of natural gas by contracting two floating regasification vessels to process imported liquefied natural gas, linking them into its vast offshore infrastructure network.

The Amazon Basin



Source: A Conservation Assessment of the Terrestrial Ecoregions of Latin America and the Caribbean Dinerstein et al, 2006. Courtesy of Imazon.

Pragmatic solutions like these are needed in the Amazon. An innovative agenda for a sustainable Amazon is likely to make a difference long before the protracted climate change negotiations will show results.

Although Brazilian society at large is mostly unaware that current developments in the Amazon are critically important for the country's future, there has been some progress in this direction during the last few years (CEBRI and CINDES, 2007). As with everything in Brazil, the path forward will not be linear. In fact, the development of a plan for a sustainable Amazon will undoubtedly mirror the "organized chaos"– the multitude of interests and voices pushing and pulling in different directions until consensus emerges – that accompanied such previous milestones as the ethanol program and the increased natural gas usage in the country's energy matrix.

The attention of the scientific community, in particular the work of the Large Scale Biosphere-Atmosphere Experiment in Amazonia (LBA), as well as serious NGOs – including Brazilian organizations Imazon and the Fundação Brasileira para o Desenvolvimento Sustentavel (FBDS), and international groups such as the World Wildlife Fund (WWF) and the Global Canopy Programme – have helped to focus attention and secure credible data on a multitude of issues related to the Amazon. It was, however, former Brazilian Minister of Environment Marina da Silva, a native of the Amazon and daughter of rubber-tappers, who brought the issue to the national stage. Her efforts culminated in the launch of the "Plano Amazônia Sustentável" (Plan for a Sustainable Amazon – PAS) on May 8, 2008. The plan was meant to be a conceptual framework, containing general directives and recommendations for its implementation.

Given the many interests involved in the Amazon – from indigenous peoples on protected reserves to landless peasants, from agribusiness to forestry giants, and everyone in between – the government handed PAS' coordination to the Minister of Strategic Affairs, Brazilian-born Harvard law professor Roberto Mangabeira Unger.

Despite competing visions and interests, there have been some modest accomplishments over the last few years. Since the government began implementing policies aimed directly at curbing deforestation, the rate of loss has declined. On the planning side, Minister Unger is giving body to PAS by singling out specific issues such as the regularization of property rights. He has also focused on the politics of conservation; the

reorganization of the agriculture/cattle-raising sectors in the savannahs (the Amazon is not all trees and forest); the development of industrial development strategies for the forest, agriculture, etc.; the development of a multidimensional transportation and logistics plan; and the incorporation of a science and technology component to the overall Amazon strategy.

Of course, these discussions involve debates over what funding modalities exist, what new mechanisms could be created, and which would be acceptable to the local and federal governments. In addition, there is a vigorous discussion on the positions Brazil should adopt in climate change negotiations. Some ministries are reluctant to discuss any mechanism that could imply even a minimal relinquishment of sovereignty, while others are concerned with the implications of negotiating only on carbon, rather than a wider framework that includes biodiversity. The debate has extended to the position Brazil should take on the new Reducing Emissions from Deforestation and Degradation (REDD) initiative, which was included in the United Nations Framework Convention on Climate Change (UNFCC) in December 2007 in Bali.

So far, however, Brazil's official position is that it will not issue carbon credits in exchange for donor contributions associated with the Amazon. President Lula da Silva created an Amazon Fund in July, 2008, as a means to secure non-reimbursable financing to prevent, monitor and combat deforestation, as well as fostering the conservation and sustainable use of forests in the Amazon biome. The decree establishing the fund handed administrative responsibility to the Brazilian Development Bank (BNDES), and specifically states: "the BNDES will issue a diploma recognizing the contribution of donors. Diplomas will be nominal, non-transferable and will not imply equity rights or carbon credits offsets" (Brazilian Development Bank, 2008). Nonetheless, the Brazilian plan recognizes that achieving sustainability in the Amazon Basin will require a regional approach. To this end, the Amazon Fund allows for 20 percent of the total to be spent by other countries in their efforts to monitor and control deforestation.

Norway was the first contributor with a pledge of US$ 1 billion by 2015. The first US$ 110 million is scheduled to be delivered during 2009-10. Although Norway is not receiving carbon credits, it has made clear that the rationale for its contribution is that improvements in deforestation will positively impact climate change. Still, it appears that the broader agenda of sustainability and biodiversity has yet to capture the imagination of potential donors.

Brazil has shown that it has the ability and capacity to launch this plan. Nonetheless, the road to success will be long. The plan will need to be fully developed, financed, implemented and monitored. Brazil's overall success would be greatly enhanced through engagement with its Amazon neighbours and the support of other countries in the hemisphere.

Next Steps

The importance of the sustainability of the Amazon Basin cannot be overstated. A solution to this challenge needs to be found well before the protracted climate change negotiations can be expected to bring about any change. To this end, it is paramount that each Amazon country design a national plan for its own territory's sustainable development.

Support for this approach – as opposed to pressure to conform to global standards – would greatly enhance the prospects for achieving sustainability in the Amazon. In addition, when requested, assistance with institutional capacity building, scientific know-how, and access to state-of-the-art technology would aid and accelerate the process.

A sustainable development plan for equatorial forests, focusing attention on the Amazon, could be presented as the hemisphere's contribution to the global climate change negotiations.

3 PATHWAY
A new approach to the electricity sector in Central America and the Caribbean

Central America

Since at least the 1970s, Central American countries have been trying to integrate their electricity networks. They expected integration to complement market reforms and improve economic efficiency, increase sustainability, and facilitate growth and development. Efforts to integrate the electric system included the signing of several treaties and the creation of two supranational institutions. Yet today, about 99 percent of the energy consumed in Central America is domestically produced, efficiency still lags, and hydrocarbon usage has increased. If electricity integration once commanded the leaders' attention, now it is energy security and environmental concerns that must be the priority. The time is ripe for the region to re-evaluate the focus on integration and explore new ideas on how to achieve reliability, efficiency, and sustainability.

The Issue

The effort to share resources in the electricity sector in Central America started in 1976 with a transmission line between Honduras and Nicaragua. By 1986, most Central American countries had the infrastructure to share electricity, at least bilaterally. In the 1990s, several of the countries reformed their power sectors and, in December 1996, six countries committed to integration with the signing of the Central American Market Framework Treaty. On that occasion, they declared the construction of the "Sistema de Interconexión Eléctrica de los Países de América Central (SIEPAC)" – consisting of the infrastructure to deliver a fully integrated electricity system – as a priority.

The main thrusts behind these reforms were the privatization and liberalization of the electricity sector and the modernization of the regulatory framework -- in some countries the regulatory framework was virtually non-existent. A private open-market framework was expected to lead to efficiency and reliability. Sustainability was often proclaimed as an objective, but no specific policies were developed because the prevailing belief was that the market would deliver it automatically. The theory was that privatization would generate funds for the public purse and free governments from contracting debt to finance infrastructure (Tomiak and Milan, 2002: 1).

Privatization did in fact deliver a substantial increase in supply. As Table 1 demonstrates, since 1985 installed capacity has increased almost 150 percent, and demand more than 200 percent. While electricity generation was virtually a public monopoly in the 1980s, by 2007 state production accounted for less than 39 percent of the total. Electricity demand was met, allowing the state to dedicate freed-up resources to other important areas.

Contrary to expectations, market liberalization did not deliver system efficiency – at least on the supply side – or sustainability, nor did it translate into a natural convergence of electricity markets. Even after the creation of SIEPAC, the signing of two additional protocols, the establishment of two institutions with supranational powers to oversee electricity integration, and the launch of yet another initiative – the Plan Puebla-Panama – trade in electricity in 2007 represented less than 1 percent of the total supply – a percentage even lower than in 1985. Note that SIEPAC was originally scheduled to start operating in 2006, but is still not functional. It is expected to start later this year. At only 300 MW, however, it will not have a major impact on a system with 10,000 MW of capacity.

As shown in Table 1, system efficiency remains low and has not improved in two decades. In electricity markets, losses to the system – measured as the difference between electricity generated and sold – are an important component of "supply side efficiency." Unfortunately, aggregate regional data hides the

Table 1:
Electric Energy Supplies in Central America

	Megawatts (MW)		Gigawatt hours (GWh)								
Year	Installed Capacity	Max. Demand	Net Generation		Export	Import	Traded	Available	Sales	Traded as % of Available	% Losses
			Public	Private							
1985	3931.4	1988.0	10562.3	35.3	205.9	204.2	410.1	10596	9138.5	1.9	13.8
1990	4129.3	2614.9	14175.2	83.9	421.5	399.5	821.0	14237.2	11813.4	2.9	17
1995	5218.4	3630.5	17160.8	2430	290.3	289.9	580.2	19523.8	16159.2	1.5	17.2
2000	7256.5	4772.4	17160.8	13584.8	1478.6	1467.3	2945.9	26652	22599.1	5.5	15.2
2002	7891.5	5169.6	12737.6	16974.6	985.8	991.4	1977.2	29500.2	24551.8	3.4	16.8
2003	8287.1	5403.9	12539.7	18767.1	848.3	842.5	1690.8	31137.7	25857.7	2.7	17
2004	8862.9	5688.0	12708.1	20252.1	1088.6	1082.6	2171.2	32767.2	27413.4	3.3	16.3
2005	9132.4	5951.8	13739.6	20764.4	560.5	562.3	1122.8	34099.8	28404.4	1.6	16.7
2006	9369.1	6285.1	14776.0	21604.2	217.6	218.5	436.1	36080.5	30202.9	0.6	16.3
2007	9719.1	6505.2	14758.6	23475.2	291.9	293.1	585.0	37822.4	31971.2	0.8	15.5

Source: Central American Isthmus: Electricity Sector Statistics
CEPAL, 2008

differences between countries. In 2007, individual country losses ranged from 28.4 percent in Nicaragua, the worst performer, to 10.6 percent in Costa Rica, the most efficient of the group. In contrast, during the same year, losses in the United States were 5.9 percent. It may be unrealistic to expect losses as low as 6 percent in developing economies, but even modest efficiency gains would generate considerable benefits.

The goal of increasing sustainability clearly failed. Table 2 shows that an unintended consequence of privatization has been the over-reliance of the region on hydrocarbons. The predominantly privately-owned electric sector, likely as a response to financing mechanisms, tends to opt for projects that have short gestation periods. Hydrocarbon projects are also favored because they have a much lower capital cost than most hydro projects - $1 million per MW or less compared to at least $2 million and often $3 million per MW for the hydroelectricity equivalent. Finally the fast turnaround of hydrocarbon projects has led to a doubling of reliance on this type of production, from a paltry 17.2 percent in 1985 to 41 percent in 2007.

Table 2:
Electricity Supply in Central America by Fuel Source (GWh)

Year	Total	Cogen	Wind	Hydro	Geo	Steam	Diesel	Gas	Coal	Total Hydrocarbon	Hydrocarbon as % of total
1985	10562.3	0.0	0.0	8078.5	664.2	1237.9	115.8	465.9	0.0	1819.6	17.2
1990	14175.2	0.0	0.0	12165.9	747.6	1013.8	16.5	231.4	0.0	1261.7	8.9
1995	19454.4	127.4	0.0	11468.5	1159.0	1870.4	2168.3	2660.9	0.0	6699.6	34.4
2000	26955.4	721.6	182.7	15417.8	1999.3	1133.8	6351.1	590.6	558.4	8633.9	32.0
2001	28022.5	634.8	185.5	13714.6	2241.5	2272.9	7741.1	384.1	848.0	11246.1	40.1
2002	29712.2	774.0	258.9	14462.9	2341.2	1875.6	8581.2	475.1	943.3	11875.2	40.0
2003	31306.8	800.5	230.0	14530.1	2502.5	2047.2	9864.3	440.2	892.1	13243.8	42.3
2004	32960.2	888.0	255.3	16062.3	2504.1	1732.9	10295.1	192.5	1030.0	13250.5	40.2
2005	34504.0	1251.3	203.6	17050.3	2461.5	1611.2	10601.0	346.5	978.5	13537.2	39.2
2006	36380.2	1355.6	273.5	17790.5	2635.6	1967.5	10789.3	557.7	1010.5	14325.0	39.4
2007	38233.8	1601.7	241.1	17747.4	2975.5	2336.3	11549.5	744.8	1037.5	15668.1	41.0

Source: Central American Isthmus: Electricity Sector Statistics
CEPAL, 2008

There are many possible explanations for the meagre trade in electricity. The 2000, 2002 and 2004 peaks are likely the results of excess available capacity from new generation entering the system. Otherwise, thin trading may be accounted for by insufficient excess capacity or, if there was extra capacity, perhaps it was offered at too high a price. It seems that the bulk of the new generation was installed to service domestic markets. Moreover, some governments demonstrated great unease in allowing for long-term contracts, particularly when the country supplying power had to waive its rights of first refusal. That is, countries wanted to retain the right to consume the electricity generated domestically in case of an emergency. National interests supersede the drive for integration. In addition, given the susceptibility of the region to massive damage caused by climate change, a fully-integrated system would likely increase the risk of system-wide outages.

Three decades of effort to integrate electricity systems have delivered the infrastructure and the regulatory framework necessary to make integration a reality. Yet, trade is minimal, system inefficiency remains stubbornly high, and improvements in sustainability have not been realized. It is time to re-evaluate, recalibrate, learn from the past, and forge ahead.

Next Steps

Central American countries should plan a future sustainable energy matrix taking into consideration each country's endowments, as well as those of the region as a whole. This effort should be coordinated with the private sector and multilateral financial institutions to ensure that priority approval and funding is given to projects that move the country and the region towards their desired matrixes.

Central American governments should also place efficiency gains instead of integration at the centre of their efforts, as this approach will certainly yield better returns to the investment in time, energy and finances of all governments involved.

The Caribbean

The Caribbean is one of the regions of the Americas most vulnerable to the effects of climate change. Yet, with few exceptions, the islands are almost entirely dependent on imported hydrocarbons, an energy source with a heavy environmental footprint. Moreover, over-reliance on hydrocarbons, particularly oil, weighs heavily on public finances as governments attempt to deliver electricity to their populations at affordable prices. It is clear that the Caribbean states' energy policies are not economically viable nor environmentally sustainable over the long term. Given small domestic markets and the broad economic and social challenges most islands face, solutions are not easy to discern. Difficulties in the electricity sector start at the most basic level, as even the data necessary to understand the problems is missing.

The Issue

On electricity matters, the Caribbean states have focused on cooperation and the development of a viable electricity sector rather than integration. In 1989, nine organizations – electric utilities, suppliers, manufactures and other stakeholders operating in the electricity industry – established the Caribbean Electric Utility Service Corporation (CARILEC) to increase the sector's efficiency and viability. CARILEC was part of an electric utilities modernization project funded by the US Agency for International Development (USAID) and implemented by the US National Rural Electric Cooperative Association under a five-year "Co-operative Agreement."

Although electricity generation has increased, dependency on imported hydrocarbons is the prevalent reality for most islands and will be for quite some time. Short-term solutions to high energy prices consist of government subsidies for electricity and gasoline. This is a dangerous strategy, as an OAS report recently

stated: "Subsidizing the final energy carriers without investing in renewable energy alternatives will drain the national budget and ultimately hamper the socio-economic development" of these countries (OAS, 2009: 3). In an attempt to improve this situation, the Caribbean Sustainable Energy Project (CSEP) was recently launched. CSEP involves 7 of the 15 Caribbean Community (CARICOM) countries: St. Lucia, Dominica, Grenada, St. Kitts & Nevis, St. Vincent & the Grenadines, Antigua and Barbuda, and The Bahamas, with Barbados as an observer country. CSEP aims to improve energy security, reduce electricity tariffs, enhance environmental protection and improve resource allocation.

Although energy integration in the Caribbean is hard to envision, when oil and natural gas prices were high Trinidad and Tobago, through the auspices of a joint public/private sector company, the Eastern Caribbean Gas Pipeline Company (ECGPC), began feasibility studies and the political groundwork for a 600-mile undersea pipeline connecting several eastern Caribbean islands. There was also some discussion of linking Dominica's geothermal plant to the French islands of Martinique and Guadeloupe. Now, however, the chances of these projects going forward are slim due to the global economic crisis. This is not necessarily a negative outcome. As the previous discussion on Central America shows, integration does not always provide the needed solutions.

If the economic downturn translates into a difficult situation for resource-poor Caribbean countries, the current plummeting oil prices provides some respite. Nonetheless, financial pressures are unlikely to disappear quickly, given the heavy reliance on imported hydrocarbons and associated transportation costs. So far, most countries have relied on the preferential terms offered under the PetroCaribe accord. While in the short term this helps governments make ends meet, in the long term it only serves to drive countries deeper into debt.

There is considerable potential for renewable energy in the Caribbean. A significant proportion of individual countries' needs could be met with hydroelectric, solar, wind, geothermal (in some eastern Caribbean islands), and renewable thermal power. In the future, these nations may also exploit ocean thermal energy conversion technology. While there is a need to increase generation, particularly using alternative fuels, securing the required funds for these investments will be challenging. Solutions will likely come from new technologies in micro-generation combined with alternative fuels, all adapted to the islands' conditions. Although the potential in using these technologies is great, past experience shows that micro-generation is often much more expensive than larger plants due to the fixed administrative and maintenance expenses associated with a power plant. For all these elements to come into play, however, reliable data must be collected, organized, and disseminated. In light of these difficulties, it is important for the nations of the Caribbean to focus as much attention as possible on conservation and efficiency, and on policies that could result in greater long-term energy security.

Next Steps

One of the reasons why it is possible to conduct an in-depth evaluation of the Central American electricity sector is that there is a wealth of data, going back to at least the 1980s. This is a reflection of demands made by the Central American countries to the regional institutions, from CEPAL to the IADB. The Caribbean countries should do the same and request that the systematic collection, compilation, and publication of data be a priority. This is a fundamental building block of any initiative planning.

The governments of the Caribbean should explore alternative fuel micro-generation and other alternative electricity generation technologies, and, with the help of developed countries, adapt these new technologies to Caribbean conditions. Multilateral financial institutions must give priority to these sectors when approving projects.

They should also concentrate efforts on improving system efficiency and on the conservation of existing resources. Conservation and efficiency objectives can be enhanced by adding an educational component that helps to inform and change consumer behaviour. In this case the region can benefit from the experience of other countries in this area, such as that of Uruguay in the production of instructional material for school children, as well as a host of other experiences in the hemisphere.

Conclusion

The current financial and economic crises presents a serious challenge for the Western Hemisphere, but it also offers opportunities for creating sustainable energy partnerships in the Americas. There is much room to question the status-quo and the ground is fertile for innovative ideas, which, however, must be grounded in the history and realities of the region.

If the last decades were defined by a desire for integration and a belief that markets provide most of the solutions, the decades that follow are likely to provide a counterpoint. In reaching for the best solutions, there is an important role to be played by all sectors – government, private, civil society, and scholars – within a more balanced setting.

Governments need to dedicate serious attention and effort, in conjunction with the private sector to the planning and development of sustainable energy matrixes. Focusing on conservation and increasing the efficiency of processes and systems will yield economic and social benefits. Over the long term, research and deployment of new technologies capable of delivering an array of options will help transform the hemisphere's energy matrix.

The Fifth Summit of the Americas presents an opportune moment for the hemisphere. Through enhanced cooperation and commitment, the Americas have the potential to demonstrate to the world how sustainable energy security can be achieved in a peaceful and constructive manner.

End Notes

1. A full analysis of the AOSTRA model is offered in Annette Hester and Leah Lawrence (2008). "A Sub-National Public-Private Strategic Alliance for Innovation and Export Development: The Case of the Canadian Province of Alberta's Oil Sands." New York: The Economic Commission for Latin America and the Caribbean.

2. Eight countries make up the Amazon Basin: Brazil, Peru, Bolivia, Colombia, Ecuador, Guiana, Suriname and Venezuela. For more information please consult the Organization of American States Office for Sustainable Development (2005). "Amazon River Basin: Integrated and Sustainable Management of Transboundary Water Resources in the Amazon River Basin" Water Project Series, no. 8. Available at: http://www.oas.org/dsd/Events/english/Documents/OSDE_8Amazon.pdf.

3. The Amazon Cooperation Treaty (ACT) was signed on 3 July 1978 by Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname and Venezuela, aimed at promoting joint actions towards the harmonious development of the Amazon Basin. At that time, ACTO Member States undertook the shared commitment with environmental preservation and the rational use of the Amazonian natural resources. In 1995, the eight nations decided to create the ACTO, to strengthen and implement the Treaty goals. The amendment to the ACT was approved three years later, and the Permanent Secretariat was established in Brasilia in December 2002. Amazon Cooperation Treaty Organization (2009). "ACTO." Brazil. Available at: http://www.otca.org.br/en/organization/index.php?id=101.

4. Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama.

5. The Puebla-Panama Plan (Spanish: Plan Puebla Panamá, acronym PPP also known as Mesoamerican Integration and Development Project, or Project Mesoamerica) is a multi-billion dollar development plan formally initiated in 2001, which is intended to "promote the regional integration and development" of the nine southern states of Mexico (Puebla, Guerrero, Veracruz and points south) with all of Central America and Colombia. The initiative was championed by the then president of Mexico, Vicente Fox, and agreed to by the governments of the respective participating nations.

6. Calculated from the Energy Information Administration's Annual Energy Outlook 2008. Available at: http://www.eia.doe.gov/oiaf/archive/aeo08/index.html.

7. The fifteen full members of CARICOM are: Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago. There are five associate members: Anguilla, Bermuda, British Virgin Islands, Cayman Islands, Turks and Caicos Islands. There are seven observers: Aruba, Colombia, Dominican Republic, Mexico, Netherlands Antilles, Puerto Rico, and Venezuela. Caribbean Community Secretariat (2009) "Members". Available at : http://www.caricom.org/jsp/community/member_states.jsp?menu=community.

8. PETROCARIBE is the Energy Cooperation Agreement currently signed by 18 members: Antigua and Barbuda, Honduras, Bahamas, Jamaica, Belize, Nicaragua, Cuba, Dominican Republic, Dominica, Saint Kitts and Nevis, Grenada, Saint Vincent and the Grenadines, Guatemala, Saint Lucia, Guyana, Suriname, Haiti, and Venezuela. PDVSA, Venezuela's state-owned petroleum company, offers petroleum products with preferential access and prices to the Caribbean nations. PETROCARIBE promises an energy-saving strategy for the efficient use of hydrocarbons and renewable resources that will integrate the region. PDVSA. Gobierno Bolivariano de Venezuela. Ministerio del Poder Popular para la Energía. (2009). "Petrocaribe: Union to be Free."

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