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Sustainable Energy Policy Initiative Report for Latin America and the Caribbean

Departamento de Desarrollo Sostenible, Organización de los Estados Americanos

Energy and Security Group

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renewable
energy
& energy
efficiency
partnership

SUSTAINABLE ENERGY POLICY INITIATIVE REPORT FOR LATIN AMERICA AND THE CARIBBEAN

Prepared for:
Renewable Energy and Energy Efficiency Partnership

Prepared by:
Department of Sustainable Development
Organization of American States

and

Energy and Security Group

Funded by:
Renewable Energy and Energy Efficiency Partnership

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Acronyms

ACORE	American Council on Renewable Energy
ASI-FIPATERM	Systematic Program for Integral Saving
CDM	Clean Development Mechanism
CFE	Federal Energy Commission, Mexico
CNE	National Energy Commission, Dominican Republic
CONACYT	National Science and Technology Council, Mexico
CONAE	Mexican National Energy Efficiency Commission
CSD-15	15 th session of the United Nations Commission on Sustainable Development
DEP	Executive Directorate of Projects, Peru
DSD	Department of Sustainable Development
DSM	Demand side management
ESCO	Energy service company
ESG	Energy and Security Group
FAEE	Argentinean Energy Efficiency Fund
FEDEI	Electricity Investment Development Fund, Argentina
FIDE	Electric Power Saving Trust Fund, Mexico
FONER	National Rural Electrification Fund, Peru
G8	Group of Eight
GEF	Global Environment Facility
GW	Gigawatts
IPPs	Independent power producers
LAC	Latin America and the Caribbean
LAFRE	Law for the Use of Renewable Energy Sources, Mexico
LFC	Luz y Fuerza del Centro
MEM	Bulk electricity market, Argentina
MW	Megawatts
NFFO	Non-fossil fuel obligation
NRECA	National Rural Electric Cooperative Association
OAS	Organization of American States

PA y EEP	Energy Efficiency in Public Buildings Program, Argentina
PAEPRA	Programa de Abastecimiento Eléctrico a la Población Rural de Argentina
PAESE	Energy Conservation Program for the Electric Sector, Mexico
PEE	Energy Efficiency Project, Argentina
PERMER	Proyecto de Energía Renovable en el Mercado Eléctrico Rural, Argentina
PIEEP	Argentina's Increased Productive Energy Efficiency in Industry Program
PPAs	Power purchase agreements
PROBIOCOM	Biofuels Use Promotion Program
PROCAE	Electric Appliances Quality Program, Argentina
PROENER	Argentina's Energy Efficiency Program
PRONATURA	Pro-Nature Fund, Dominican Republic
PUREE	Program for the Rational Use of Electric Energy
REEEP	Renewable Energy and Energy Efficiency Partnership
REGAE	Renewable Energy Growth Assistance Entity
SEPI	Sustainable Energy Policy Initiative
SIEPAC	Electricity Interconnection System for the Central American Countries
USA	United States of America
USAID	United States Agency for International Development

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1. Introduction

Purpose

This document provides information on existing sustainable energy policies and regulations and the potential for policy reform in five countries in Latin America and the Caribbean. These are Argentina, Dominican Republic, Guatemala, Mexico, and Peru. It also documents successful strategies, policies, and laws that provide incentives to promote and develop sustainable energy, including experiences and lessons learned from Latin America and Caribbean (LAC) and non-LAC countries. This work is conducted by the Organization of American States (OAS) Sustainable Energy Policy Initiative (SEPI), with support of the Energy and Security Group (ESG). SEPI was funded by the Renewable Energy and Energy Efficiency Partnership (REEEP).

SEPI

The goal of SEPI is to advance the development and implementation of effective sustainable energy policies and regulations in LAC, with a focus on renewable energy and energy efficiency. The objectives of SEPI are to track, document, and routinely update renewable energy and energy efficiency policies and regulations in each LAC country; determine best practices for policy and regulatory reform in the region; provide a reference base for renewable energy and energy efficiency policies and regulatory measures occurring in other countries worldwide and their impact; and identify and educate key stakeholders critical to bringing about a significant change in the policy and regulatory environment in LAC countries. SEPI is conducted by the OAS Chief of the Energy, Climate Change, and Natural Disasters Division, Department of Sustainable Development (DSD).

Approach

SEPI seeks to address the following issues in the five participating countries:

- Identify existing sustainable energy policies and regulations and the potential for policy reform in the target countries.
- Determine successful strategies, policies, or laws that provide incentives to promote and develop sustainable energy, including experiences and lessons learned from non-LAC countries.
- Highlight key opportunities for policy reform and identify needs for changes in target countries.
- Identify country specific guidelines that highlight the critical reforms necessary to stimulate further growth of renewable energy and energy efficiency markets.
- Recommend activities for each country that outline possible pathways to affect the recommended reforms.

In September 28, 2006, SEPI held a meeting in Montevideo, Uruguay to review SEPI priorities and objectives with LAC counterparts and begin to discuss the above issues.

Based on the outcomes of the meeting a small number of target countries were selected to take advantage of ongoing opportunities where SEPI may affect policy and legal reform. These countries were Argentina, Dominican Republic and Peru. Two additional countries—Mexico and Guatemala—were identified to participate in this exercise as special case countries that offer valuable inputs due to their experience in enacting new legislations and policies that promote the use of natural resources for energy generation.

A follow-on workshop that brought together officials from the target countries was held on March 5-6, 2007, in Las Vegas, Nevada, in association with the American Council on Renewable Energy (ACORE). The goal of the workshop was to identify concrete needs of these countries, analyze what activities are underway in other countries (industrialized and developing) faced with similar situations, and recommend how policies can be improved in the five participating countries.

2. Renewable Energy and Energy Efficiency Policy Overview

LAC Energy Overview

The key market drivers for renewable energy and energy efficiency development in Latin America and the Caribbean are energy security, economic development, and climate change. Renewable energy advances energy security as it diversifies a country's energy mix and reduces the impact of fossil fuel price uncertainty. Renewable energy is good business, can be profitable, and is able to boost economies in the short, medium, and long term. It stimulates economic development to include developing markets, building industries, generating jobs and incomes, and reducing poverty. Climate change benefits from renewable energy as it helps ensure a cleaner environment and it reduces carbon dioxide and other harmful emissions.

At present, electricity generation in Latin America is dominated by large hydro, natural gas, and fossil fuels (oil and diesel). In the Caribbean, almost all electricity generation comes from imported oil and diesel. For the entire region, primary energy consumption increase was 3.11% from 2002-2003. In this decade alone LAC will require a 50% increase in installed capacity, or 90 GW. While this demand increases, at least 50 million people, or 13% of the region's population, remain without access to electricity, with 20-90% of the rural population lacking access to electricity depending on the country.

Electricity markets in Latin America are 'competitive' and are generally separated between generation, transmission and distribution. These markets engage independent power producers (IPPs), with power purchase agreements (PPAs), and bulk market agreements. Markets in the Caribbean consist of vertical monopolies and policies that ensure a set rate of return for electric companies.

Key concerns regarding energy markets in LAC include the following: energy sector supply and reliability, the high costs of imported fuel, rural poverty and urban migration, urban and household pollution, vulnerability and adaptation to climate change, pressures of mitigating climate change, management of natural resources, and the role of energy efficiency.

Strategies to address these concerns include interconnections and cooperation among countries, implementation of energy efficiency measures, and diversification of energy resources. There are various types of interconnection and cooperation measures among countries, including interconnection of electricity networks and grids, as is the case of the Electricity Interconnection System for the Central American Countries (SIEPAC). Fuel supply interconnections include gas pipelines, as those that span Bolivia, Brazil, and Argentina and PetroCaribe's 'virtual' fuel interconnection. Cooperation and harmonization of policies, regulations, norms, and standards in the region is needed in order to ensure the success and continued expansion of these interconnections.

Energy efficiency strategies that address LAC energy concerns include demand side management, commercial efficiency programs, and improvements in the transport sector.

Mexico's energy demand side management and efficiency programs are led by a dedicated agency, the National Energy Efficiency Commission (CONAE) and by the Electric Power Saving Trust Fund (FIDE). A good example of commercial efficiency program is the Caribbean Hotels Association's Efficiency Program. Apart from specific energy efficiency programs and agencies, involvement from other sectors can also address energy efficiency concerns in LAC. For example, with the transport sector as a major and sometimes the largest energy consumer in a country, improvements in road conditions and public transportation system, including energy efficiency standards, can help a country save energy and decrease energy consumption.

Diversifying energy resources is another strategy to address energy concerns. Expanding the fuel and electricity supply resources to include renewable energy, fossil, and nuclear sources brings some diversity to a country's energy portfolio. Electricity options from renewables include biomass, geothermal, hydropower, solar, and wind energy options. Transport sector energy supply diversification options could include use of biofuels, hybrid vehicles, and public transportation.

Renewable Energy

Renewable energy policy incentives generally seek to reduce costs of construction or production of renewable energy; increase costs for fossil fuels, based on environmental costs; and open markets for these technologies. Policies used for increasing renewable energy use typically fall into two categories. The first category is market push policy options, which are aimed at increasing renewable energy supply. The second category is market pull policies aimed at increasing the demand for renewable energy. Additional categories are other market pull mechanisms and mega policies.

Market push policy options. Market push policies include tax incentives, direct cash payments, and low-cost capital programs.

- Tax incentives aim to reduce capital and operating costs for renewable energy. Examples of tax incentives are production tax credits, investment tax credits, sales tax reductions, property tax reductions, and accelerated depreciation.
- Direct cash payment incentives seek to increase the number of renewable energy facilities. Examples are direct investment incentives, or grants, and direct production incentives.
- Low-cost capital program incentives are used to increase financing for renewable energy facilities. Types of low-cost capital program incentives are government-subsidized loans, project loan guarantees, and project aggregation and bulk purchasing.

Market pull policy options. These include distributed resource policies, customer choice programs, and others.

- Distributed resource policies are used to increase market demand for renewable energy through, for example, standard contracts for small projects, net metering,

line extension policies, and public benefit funds-otherwise known as system benefit charges.

- Customer choice opportunities try to stimulate markets for renewable energy using mechanisms as utility-supplied green pricing options, green marketing, and aggregated consumer purchases.
- Other market pull policies are general environment regulations. The goal of using general environmental regulations is to increase the price of fossil fuels relative to the price of renewable energy. Externality valuation, environmental dispatch, emissions taxes, and emissions caps are policy options that fall under the general environmental policies category.

Mega policies options. Mega policy options include renewable portfolio standards (RPS), feed-in laws, and tendering mechanisms¹.

- Renewable portfolio standards are quantity-based government mandates that require a certain percentage of wholesale or retail market participants' (utilities or grid companies) overall or new generating capacity or energy sales must be derived from renewable resources.² The RPS focus is on emerging and new renewable energy technologies. They are good at reducing cost and price with competitive bidding if accompanied by long term PPA, yet tend to favor least-cost technologies and established industry players unless separate technology targets or tenders are put in place. The RPS tend to be more compatible with reformed electricity markets and may take longer to build local industry and meet resource targets. They are also more complex to design and administer than feed-in laws. For an RPS to be successful, policy design is critical. Success requires energy and output based levels with the set target increasing over time, strong and effective enforcement of the renewable portfolio standards, and the creation of a certificate-trading platform based on compliance tracking.
- Under feed-in laws, a utility must take power from eligible facilities at a set government mandated price. There are three methods for setting this price: using the estimated long-term cost plus reasonable profit, the wholesale avoided cost of power, or the percent of retail electricity rate. Feed-in laws focus on new and emerging technologies. Feed-in laws produce high penetration rates in a short period, create local manufacturing opportunities, provide strong incentives for private investments, and can be cost effective if the tariff is adjusted wisely and periodically. To date, feed-in laws have demonstrated the highest installation rates for renewable energy and are considered the most desirable by investors given their price certainty. Feed-in laws are the simplest mega policy to administer and enforce, allow for the greatest resource diversity, best local industry development, and work most effectively in regulated markets. For a feed-in law to be successful, long term contracts, on the order of 15 to 20 years,

¹ Hamrin, Jan. 'Mandated Market Policy Overview' International Grid Connected Renewable Energy Policy Forum Presentation. <http://www.gridre.org/home.html>

²Database of State Incentives on Renewables and Efficiency. Glossary. <http://www.dsireusa.org/glossary/index.cfm?CurrentPageID=8&EE=1&RE=1>

are beneficial. Other success factors are having a guaranteed buyer under standard contract, a tariff that gives a reasonable rate of return, and flexibility that allows for capturing of cost efficiencies.

- Tendering policies are government sponsored competitive bidding processes for renewable energy where the lowest priced projects are awarded contracts that guarantee a specific amount of power generated at specified price over a fixed period. Using tendering policies, the government pays the incremental cost of renewable energy. Tendering policies are usually combined with other policies, such as a public benefit funds (e.g. Non-fossil fuel obligation, NFFO) or resource concession (e.g. wind resources). Tendering policies are effective at reducing cost if the industry is established, but need to have a mechanism to lower prices over time. Tendering policies will not build markets on their own— they usually need companion policies. Tendering policies can discourage local industry formation and can be politically challenging to find stable source of funding. Ensuring that signed contracts are realized is a key challenge, as these reduce risks for investors. The contracts or tenders awarded must be large enough to achieve economies of scale and should be awarded every year to create stability to ensure success. Additionally, appropriate penalties for not meeting milestones and a stable source of funding are required.

Table 1 summarizes the pros and cons of the various mega policies according to a number of criteria including quantity of renewable energy development, cost/price reduction, resource diversity, market sustainability, local industry development, investor certainty, and simplicity.

Table 1. Renewable Energy Policy Review³

	Quantity of Renewable Energy Development	Cost/Price Reduction	Resource Diversity	Market Sustainability	Local Industry Development	Investor Certainty	Simplicity
Feed-In Laws	Large amounts renewable energy in short time	Cost efficient if the tariff is periodically and wisely adjusted	Excellent	Technically & economically sustainable	Excellent	Can reduce investor risk with price guarantee & PPA	Most simple to design, administer, enforce, contract
RPS	If enforced, can meet realistic targets	RPS <u>and</u> Tendering best at reducing cost & price with competitive bidding	Favor least-cost technologies	Technically & economically sustainable	Favor least-cost technologies & established industry players	Lack of price certainty difficult for investors/PPA can reduce risk	More complex to design & administer & complex for generators
Tendering	Related only to quantity RE established by process	Good at reducing cost	Favor least-cost technologies	Tied to resource planning process; sustainable if planning supported, stable funding	Favor least-cost technologies & established industry players	Can provide certainty if well designed (more risk than feed-in)	More complex than Feed-in, simpler than RPS

³Ibid, Hamrin.

Biofuels

Biofuels offer the ability to reduce dependence on imported oil and fuel supplies; secure climate change benefits through the reduction of greenhouse gas emissions, with the added benefit of qualifying for the Carbon Credit sales under the Kyoto Protocol's Clean Development Mechanism (CDM); and enhance economic development by stimulating agricultural markets and reducing poverty (particularly after the elimination of sugar price supports from the European Union). Biofuels are also able to blend with other liquid fuels, enabling the use of existing fuel supply infrastructure. Another driver is that industrialized countries that have stepped up targets and tax incentives for biofuels and created a larger demand. For example, the European Union has set a target of 5.75% biodiesel in fuel products by 2010 and 20% by 2012. The United States has set an annual volume of 7.5 billion gallons of biofuels blended by 2012.

Currently, at least eight countries and 30 states or provinces worldwide have biofuel blending mandates and others are in development. For example:

- Argentina requires 5% biofuels blend (B5) or 5% ethanol blend (E5) in petroleum derivatives in 2010.
- Brazil allows B2 blending and will make it a requirement by 2008, later increasing to B5 by 2013.
- Colombia has E10 blending mandates in cities.
- Dominican Republic requires E15⁴ and B2 by 2015.

Currently there are over 90 biofuel projects in the Central American region alone, including in Guatemala, El Salvador, Honduras, Panama, Costa Rica, and Mexico.

Energy Efficiency⁵

The main drivers for energy efficiency are the growing global energy demand and rising energy costs. Energy efficiency offers a no regrets solution; it is the fastest, cheapest, and cleanest way to stretch energy supplies. A kilowatt saved always cheaper than a kilowatt generated. Benefits derived from the implementation of energy efficiency and conservation measures are waste reduction, reduced need for future investments, freeing up of capital and hedging of fuel risks, enhanced competitiveness, and help in long term resource planning.

Previous experiences in the implementation of energy efficiency provide valuable lessons.

⁴ E refers to ethanol. The number following it means the percentage of ethanol in the blend. For example E15 means that in an ethanol-gasoline blend, 15% is ethanol.

⁵ Scaling Up Financing in the Developing World, The Energy Efficiency Investment Forum, May 8-9, 2006, NY, NY.

- Political will and commitment are important to successful implementation of energy efficiency measures, with the participation and commitment of state and local governments being as important as that of national governments in many instances.
- Regulatory interventions are required for norms and certification programs.
- A range of policy measures have been used and have been typically sector focused.
- Energy efficiency policies and measures should be accompanied by legal and institutional frameworks that remove market distortions.
- Policy should be long term in nature, with proper pricing signals for investors, as well as consider demand and supply aspects.
- Many energy efficiency projects have associated technical assistance program support.

Table 2 provides a summary of various energy efficiency measures employed by sector.

There is a growing interest in renewable energy and energy efficiency from the international community. The Global Environment Facility (GEF) having committed over \$2 billion for renewable energy and energy efficiency. The World Bank is targeting 20% average annual energy growth from renewable energy and energy efficiency in the next 5 years. The Inter-American Development Bank (IDB) recently launched a major renewable energy and energy efficiency program. Energy, particularly renewable energy and energy efficiency, is the focus of the 15th session of the United Nations Commission on Sustainable Development (CSD-15). At an international level, the G8 has made renewable energy and energy efficiency a priority.

Table 2. Energy Efficiency Policy and Program Summary

Sector	Energy Efficiency Promotion Activity
Industrial	<ul style="list-style-type: none"> • Regulation measures • Tax incentives • Energy efficiency funds and low interest loans • Performance codes, standards, incentives, and regulations • Mandatory/compulsory energy efficiency targets • Technical assistance and small business programs • Energy audits for factories • Product labeling, rating, certification, & retro-commissioning • Energy conservation management • Recognition programs, technology adaptation & upgrades; and bulk procurements
Residential	<ul style="list-style-type: none"> • Energy manager capacity building/recognition programs • Product standards, labeling, appliance recycling • Funding/rebate programs • Energy audits/surveys • Regulations and codes for new buildings • Residential lighting incentives and new construction programs • Pro-poor fuel support programs
Commercial	<ul style="list-style-type: none"> • Technology upgrades • Energy audits & management programs • Energy product labeling • Mandatory/compulsory efficiency targets • Recognition/incentive programs • Public procurement programs & Green Buildings
Power Generation and Utilities	<ul style="list-style-type: none"> • Utility obligation programs • Demand side management (time of use) • Heat rate improvement of power plants • System loss reduction program
Transport	<ul style="list-style-type: none"> • Introduction of more efficient vehicles • Increase production of alternative fuels (e.g., biofuel, ethanol); tax holiday and import duty exemptions for these products • Low interest loans for conversion of fleet vehicles • Voluntary agreement programs (car-less day program, carpooling, park/ride programs) • Mass transit programs; tighter regulations for transport companies and cargo owners • Energy saving measures for traffic systems
Information, Education, and Outreach	<ul style="list-style-type: none"> • Energy audit procedures/training • Energy manager guidelines/certification/training • Technology transfer and demonstration programs • Public awareness campaigns, fuel economy guides, conservation programs in schools • Documentation/dissemination of best practices • Survey and monitoring, discount programs & demand bidding programs
ESCO Promotion	<ul style="list-style-type: none"> • Tax incentives • Access to low interest loans • Training/technical assistance • Monitoring and verification protocols • Standard performance contracting
Climate Change	<ul style="list-style-type: none"> • GHG reduction registry center • Emission trading & support for Clean Development Mechanism projects
Market Transformation	<ul style="list-style-type: none"> • Mix of policies, incentives, information, targets, standards above to mitigate barriers and accelerate energy efficiency adoption

3. Country Priorities, Opportunities, and Recommendations

This chapter summarizes the priorities, opportunities, and recommended areas for support in the five key countries of Argentina, Dominican Republic, Guatemala, Mexico, and Peru, as resulting from the SEPI project.

Argentina

Argentina has begun establishment of a legal framework to support and promote the use of renewable energy in the country. Among the goals for renewable energy and energy efficiency in the country are to:

- Ensure energy supply in an efficient manner, with a balancing of available natural resources and least impact on the environment.
- Achieve greater end use energy efficiency.
- Promote the use new and renewable energy technologies to increase supply in rural areas.
- Reduce the environmental impact of providing energy services and diversify the energy supply.

The objective of Argentina's renewable energy law is to promote renewable energy electricity generation and technology research, demonstration, and implementation. Argentina's renewable energy policy calls for 8% of electricity to be generated from renewable energy sources in 10 years. This law benefits producers whose electricity generation is destined for sale to the bulk electricity market (Mercado Electrico Mayorista, MEM) or for public services. The mechanisms of this law include an investment regime and subsidies. Under the investment regime, there is a tax on the expected minimum returns and another tax on the aggregate value and profits. Argentinean law establishes subsidies based on units of electricity generated. The law provides different subsidies for existing and future installations of wind and solar energy facilities, depending on the source. Future renewable energy installations include geothermal, tidal, biomass, landfill gas, and biogas facilities as well as large hydro facilities (over 30 MW).

In 1995 the Argentine Secretaría de Energía (Energy Ministry) created the Programa de Abastecimiento Eléctrico a la Población Rural de Argentina (PAEPRA) for the provision of off-grid electricity to the dispersed rural population and to provincial public services. This program aims at ensuring electricity supply to a rural population of about 1.4 million people. The Argentine government and the World Bank are implementing the PERMER project (Proyecto de Energía Renovable en el Mercado Eléctrico Rural) as a component of PAEPRA in eight participant provinces with funding from the World Bank, GEF, the Electricity Investment Development Fund (FEDEI), provincial governments, concessionaires, and the customers. PERMER aims at providing electricity for lighting and social communication (radio and TV) to rural households and provincial public service institutions through eight private concessionaires using mainly renewable energy systems. In PAEPRA and PERMER, a concession approach has been chosen for rural electrification,

mainly because of the country's ample experience with concessions for the provision of infrastructure services (e.g., telecommunications, water). The concessionaire obtains the monopoly of a given province in turn for the obligation to connect the service when requested by the customers, and to maintain its continuity over the duration of the concession. The concession contracts are tailored to the condition prevailing in each particular province and awarded through a competitive bidding process that minimizes subsidies. Concessions are eligible to re-bid for their business every 15 years up to a total of 45 years, competitively against other eligible firms. Tariffs are renegotiated every 2 years.⁶

In Argentina, the recent Biofuels Act regulates and promotes the production and sustainable use of biofuels. It encourages biofuels through fiscal benefits that are geared toward benefiting agricultural entities, primarily small and medium sized enterprises. The Act emphasizes biofuels for export to other countries in the region and for self consumption in the Argentinean agricultural sector. The law imposes a requirement of five percent biofuels in petroleum derivatives by January 2010.

Argentina's Energy Efficiency Program (Programa de Ahorro y Eficiencia Energética de Argentina, PROENER) has various programmatic areas to decrease energy consumption and increase energy efficiency. The Electric Appliances Quality Program (PROCAE) follows policy mandates for labeling of a set of household appliances according to defined standards. Under PROCAE, refrigerator and lamp exchange activities have been carried out. Another sub-program, the Increased Productive Energy Efficiency in Industry Program (Programa Incremento de la Eficiencia Energética y Productiva en la Industria, PIEEP) works to achieve the goal of enhanced energy efficiency by industry. Another program under execution is the Energy Efficiency in Public Buildings Program (Programa de Ahorro y Eficiencia Energética en Edificios Públicos, PA y EEP). Future developments are expected in the area of design and financing of energy efficiency studies.

Under PROENER, Argentina's upcoming Energy Efficiency Project (PEE), sponsored by the GEF, plans to systematically remove the barriers to energy efficiency activities and investments. The three main components of this program are: the creation of an Argentinean Energy Efficiency Fund (Fondo Argentino de Eficiencia Energética, FAEE); the development of a program for electricity distributors; and the strengthening of capacities, regulatory development, and project management expertise. Regarding the electricity market, a separate program, the Program for the Rational Use of Electric Energy (PUREE), has set an objective of reducing energy consumption by 10% over the 2003-2004 baseline year, through the use of allowances and charges within each consumer category.

Barriers to the development of renewable energy can be removed by: more in-depth evaluation of available resources; identification and knowledge exchange on existing

⁶ The World Bank. 'Argentina: Renewable Energy Rural Markets' <http://wbln0018.worldbank.org/external/lac/lac.nsf/265a7fff47916d7d852567e4004ce191/99f4c6253b18618d852567ed005ce855?OpenDocument>. 2007

projects; adjusting access to market regulations and criteria depending on energy source; strengthening the institutional framework; and provision of financing to pre-investment activities and projects. To achieve its renewable energy goals, the country should examine policies that promote self-generation for industries, such as agriculture, to increase competitiveness, reduce energy, and allow excess generation sales to the grid.

To increase energy efficiency, Argentina needs to develop further policy, in line with existing and scheduled activities and programs. For example, with the PEE, a regulatory framework is necessary for electricity distributors, energy Service Company (ESCO) promotion, and exchange of lessons learned from similar projects. Energy efficiency programs in the provinces can also benefit from working with OAS. Overall, energy efficiency policies need promotion, diffusion, and capacity building as well as strengthening of the existing institutional frameworks.

Dominican Republic

In the Dominican Republic, the General Electricity law sets out the conditions for further private sector involvement, provides customers with better legal protection vis-à-vis power providers, and creates a flexible wholesale market for electricity. The key provisions of the electricity law include:

- Assurance that at least 20% of all electricity trading is done on the spot market.
- Authorization of power generators to install connecting lines to the interconnected grid system and/or to their own customers (self-sufficient suppliers).
- Limiting distribution company ownership of generating plants to not more than 15% of peak load in the interconnected system (renewable energy sources are exempt from this rule).
- Regulation of electricity tariffs for public-grid customers with maximum connected loads of 2 MW as long as the customers do not enter into direct contracts with the suppliers
- Regulation of transit tariffs for the use of transmission and distribution of facilities.
- Provision of preferential treatment to companies that generate electricity from renewable energy sources with regard to sales and load distribution— if prices and conditions are otherwise identical.
- Exemption of companies generating electricity from renewable energy sources from national and local taxes for five years.
- Creation of a National Energy Commission (CNE) to develop energy policy measures and long-term planning of the energy sector.
- Strengthening the Superintendency of Electricity to establish itself as an independent, neutral regulatory authority with far reaching competences.
- Investing 10% of the proceeds from fines for the theft of electricity into an incentive fund for the development of renewable energy sources.

The existing policy framework in the Dominican Republic has, since 2002, set aside 2% of consumption taxes on fossil fuel and petroleum products into a fund used for programs

promoting alternative, clean, or renewable energy sources and energy efficiency. Each year, the proportion of revenues earmarked for the fund will increase by one full percentage point until it reaches 5%. This fund receives about US\$ 25 million every year. Renewable energy sources for electricity generation are prioritized in the existing framework. A new law proposes various incentives to promote renewable energy. The proposed incentives include: elimination of duties on renewable energy equipment and materials; tax free rents for 15 years; and tax exemptions on renewable energy equipment investments for individuals if the equipment was purchased for household use.

In the past, the Renewable Energy Growth Assistance Entity (REGAE), the National Rural Electric Cooperatives Association (NRECA), and the Pro-Nature Fund (PRONATURA) worked in close cooperation with rural regional development programs and village cooperatives to implement renewable energy projects, programs, and activities. These have included policy development, capacity building, and technical assistance components. They have also involved implementation of solar home and small wind power systems for household and community electrification and micro hydropower systems for decentralized village power supplies. Most of the financing for these came from the GEF small projects fund and the US Agency for International Development (USAID).

A draft Incentives for Development of Renewable Energy Sources law (Proyecto de Ley de Incentivo al Desarrollo de Fuentes Renovables de Energías) is under discussion in the Dominican Republic. This law relates to wind farms with ratings up to 50 MW, hydroelectric power plants up to 5 MW, biomass power plants with an organic fuel content of at least 80% and a maximum output of 40 MW, and electricity-generating solar installations of any size. The law provides for:

- Subsidies covering up to 50% of the initial capital outlay for up to 5 MW installed capacity (to be provided on an individual-case basis).
- Tax exemptions for imported components to be employed in installations using renewable supplies of energy.
- Halving of the power transmission fees (except in cases where transmission lines had to be specially installed for electricity generating systems based on renewable energy sources).
- Fixed remuneration rates for wind and hydropower and biomass electricity for 15 years.
- A five-year tax exemption on earnings from electricity generation based on renewable energy sources.
- A fiscal incentive for auto producers.

The Dominican Republic has begun working with and supporting private sector entities and civil society organizations to convert *Jatropha Curcas*, an endemic tree plant that exists on the border with Haiti and in some of the poorest provinces in the central and eastern side of the country, into bio-diesel. Dominican Republic is also pursuing ethanol production.

In the Dominican Republic, development of a renewable energy and energy efficiency policy framework requires the proposed Incentives for Development of Renewable Energy

Sources law and its regulations to pass legislation. For policies to be effective and beneficial to all, coordination among stakeholder agencies is needed, as is reaching a consensus on policies and national plans. In doing this, the country would benefit from international experience and aid.

Additional policy options for the country are required that address renewable energy and efficient energy use in rural and remote areas without access to energy. Possible options include: the expansion of access to rural and isolated areas through the promotion and financing of renewable and clean energy technologies, including the use of hydro and wind energy resources; and incentivizing distributed generation technologies. Promotion of these distributed generation systems could include feed-in to the grid in some instances. Further renewable energy development mechanisms should be explored, as the country has a large, untapped wind resource that could have a significant impact on the entire energy supply.

Energy efficiency initiatives should start with standards to prevent technical losses on the supply side, including in the generation, transmission, and distribution of electricity, as well as on the demand side in all sectors. The growing manufacturing sector is particularly in need of energy efficiency measures. Energy efficiency policy must also prevent non-technical losses from inefficient equipment use and theft. Once standards are developed, regular audits and enforcement of these standards must be included to ensure compliance.

Guatemala

Renewable energy has been part of Guatemala's national policy since the 1960's. In 2005, 47.2% of the electric generation in the country came from renewable energy sources. Guatemala's constitution indicates that it is the state's obligation to adopt the necessary measures to efficiently conserve, develop, and make use of natural resources. Rural electrification is also a priority under the constitution.

The country's General Electricity law, which regulates the electricity sector, states that generation, transmission, and distribution of electricity is open to all. It only demands authorization for the transportation of electricity that requires the use of goods from the public domain. The prices for the use of electrical services are subject to authorization as well. The transference of energy between generators, traders, importers and exporters, which came out from the operation of wholesaler market, is subject to the terms and conditions of this law. This policy framework has allowed the establishment of electric companies in the country, avoiding the ramifications and electricity sector disarray. A downside to the General Electricity law is that it makes the feasibility and competitiveness of distributed generation difficult due to high costs of transmission and generation. The country is addressing this issue in its current revision of the General Electricity law.

In 2003, the Renewable Energy Generation Incentives law passed in Guatemala, opening the door for renewable energy development. This law's feature is its exemption of imported renewable energy equipment and materials from duty and custom tariffs. It also allows for 10-year exemptions on some taxes during commercial operations. Along with this law, and to promote further renewable energy in the country, the government has

established a series of projects and programs. Two of these include the Energy Projects Promotion Program (Programa de Promoción de Proyectos Energéticos) and the Information and Promotion of Renewable Resources Center (Centro de Información y Promoción de Recursos Renovables). The center works to identify and evaluate renewable energy potential and serves as a sustainable training and information source that will enable investors to carry out feasibility studies throughout the country. The Identification, Localization, and Evaluation of the Potential for Renewable Energy Program includes: the development of bioenergy (including ethanol, biodiesel, and urban waste) projects; the execution of hydrological studies of river basins in the country; and a project to explore geothermal resources. Projects already in execution under this program are the Hydro-meteorological Information for Development System, the Hydrological Study of River Basins, and the National Wind and Solar Potential Maps.

In Guatemala, 75.6 % of the primary energy generation comes from biomass, but it is not particularly mentioned in policy framework. The country's bioenergy program aims to determine the national bioenergy potential, facilitate information exchange, and broadly establish the technical and political components necessary for biomass energy projects. Projects under execution are ethanol and biodiesel production projects and an improved woodstoves project. More specifically in the area of biofuels, this program plans to elaborate an ethanol program implementation strategy, propose a law regulating ethanol, harmonize biodiesel norms and regulations in the Central American region, and carry out scientific and technical cooperation and information exchange events.

There has been some difficulty with the biodiesel commercialization and production in Guatemala and this needs addressing. Oil companies own gas stations and pipelines and block access to biofuels. Due to lack of policies, biodiesel can be of poor quality. In some instances, vehicle guarantees are cancelled if the owner uses biodiesel as fuel. The oil industry is the largest source of tax revenues for the state. If commercialization of biodiesel begins, the state would decrease its tax revenue income.

With support from REEEP, Guatemala is currently developing its long-term sustainable energy plan, focusing on energy efficiency, the environment, and cost reductions. The long-term sustainable energy plan's objectives are to reduce poverty, increase economic competitiveness, enhance environmental sustainability, and mitigate climate change. The foundations for these objectives are three well-defined pillars: energy, agriculture, and the environment.

As a foundation for the development of a long-term sustainable energy plan, Guatemala has prepared data base documentation and hosted workshops with relevant stakeholders. Thus far high-level government representatives have expressed interest in energy as a driver for development, but the majority of stakeholders lack sufficient sectoral information, even though the government is trying to address this issue. Guatemala also plans to host workshops in eight regional development centers and to prepare a draft policy document for discussion among stakeholders. After review and completion of this document, a workshop with government representatives and presidential candidates will be organized to

present the draft policy report in hopes its findings and recommendations will be included in future political reforms.

Mexico

Mexico aims to achieve energy sustainability as a means of advancing energy security, environmental protection, and economic development. This will involve mitigating risk due to hydrocarbons market volatility, diversifying the energy matrix, reducing greenhouse gases and local pollutants, developing industry and labor markets, and reducing poverty.

There are constitutional and regulatory limitations for private participation in the energy sector. Since 1992, the Public Electricity Service Act allows private generation for self-supply and independent power production, but not in transmission and distribution for public service purposes. Electric public utilities have a mandate to acquire energy at the lowest available short-term economic cost. Under this scheme, electricity generation from renewable sources faces a serious setback due to their initial higher investment's costs. The lack of assessments on the social, economical, and environmental benefits derived from the use of renewables explains why national energy policies base themselves on fossil fuels.

Various mechanisms are in place which help promote renewable energy in Mexico. The National Income Tax Law establishes an accelerated depreciation of 100% on investments for renewable electricity generation equipment and machinery. The Interconnection Contract Model for Self Supply from Intermittent Sources of Energy incorporates a methodology for self-suppliers to estimate and credit the capacity contribution of renewable energy sources, such as wind, to the national electric system. Mexico also has drawn up a Renewable Energy Outlook: A Vision for 2030, which is a long term prospective for renewables penetration in the domestic energy matrix.

Existing projects and programs include the following. A large-scale renewable energy project promotes grid connected renewable energy in Mexico. This project provides, through a green fund, economical resources that will be assigned as performance incentives. The Rural Electrification with Renewables project will promote renewable energy rural electrification projects within the next 5 years and provide electricity to 50,000 homes located in the poorest municipalities of the country, with a more than 60% indigenous population. The Solar Water Heaters Program has a goal of designing a national program that fosters and introduces solar water heaters in the residential and commercial sectors.

CONAE, the National Commission for Energy Savings, promotes different programs and proposals to cover all sectors where renewable energy use makes sense, either alone or in hybrid systems. In the electricity sector this includes grid and off grid (rural) generation. For non-electric uses, it covers thermal energy applications, such as water heating and biofuels in the transport sector.

CONAE currently works on identifying regulatory and legal barriers to alternative energy solutions, providing assistance in energy policy making by accounting for the national benefits of these technologies, and developing the National Program for Renewable Energy

Promotion 2007-2012. CONAE is also involved in the development of new finance mechanisms, in coordination with local and international financial institutions, and in creating technology scenarios for promoting research and development of clean energies in coordination with academia, research centers, the National Science and Technology Council (CONACYT), and the private sector.

A new Law for the Use of Renewable Energy Sources (Ley para el Aprovechamiento de las Fuentes Renovables de Energía, LAFRE) is pending approval at the Senate. The objectives of this law are to create legal certainty, establish clear and reliable conditions, and recognize and value the short and long-term benefits that renewable energy resources represent. LAFRE would complete the existing legal framework and is compatible with the Public Electric Power Law. This new law would establish the creation of a Program for the Use of Renewable Energy Sources. Under this law, an 8% target is set by 2012 for renewable energy contribution to the total primary energy generation. It proposes the creation of a fund that will foster the use of renewable energy technologies. The fund includes a specific component that provides incentives to the application of commercial technologies, technologies in transition for electricity generation, rural electrification, biofuels, other non-electrical applications, and research and development.

Another existing government project, in conjunction with the IDB, is in the area of biofuels. This covers the development of ethanol as fuel and the identification of all major issues involved in its production, storage, distribution, and utilization biofuels. The project takes into account technical, economic (especially trade), financial, regulatory, legal, environmental, commercial, institutional, market, and social aspects of biofuels development. It also examines alternative raw materials and production processes, as well as alternate ways for utilizing ethanol as a transportation fuel in various concentrations under the prevailing conditions in Mexico. Several stakeholders will be involved in the process, focusing in the potential producers.

Various sources point to a potential national energy savings in Mexico of 20%. Existing institutional programs have achieved savings that represent 10% of the national potential and almost 2% of the national energy consumption. To reach this potential, Mexico has various devoted institutions to address this goal, the most important of which are CONAE, the Energy Conservation Program for the Electric Sector (PAESE), the Electric Power Saving Trust Fund (FIDE), the Systematic Program for Integral Saving (ASI-FIPATERM), and PEMEX's Institutional Energy Efficiency Program. It is important to emphasize that almost all the institutions have over 15 years of experience in energy efficiency and related areas.

Nationally there are policy and programmatic areas that promote and regulate energy efficiency measures. Standards are already defined for 18 electric and 2 thermal applications. Programs to increase energy efficiency in Mexico include energy saving initiatives at the national level for federal office buildings; specific programs for state-owned companies such as PEMEX, Federal Energy Commission (CFE), and Luz y Fuerza Del Centro (LFC); and for vehicles. Local government initiatives in Mexico include

measures for buildings and municipal services, street lighting, and water pumping. Energy efficiency initiatives geared towards the private sector involve support for:

- Energy audits and capacity building for small companies and large industries, through associations and chambers.
- Capacity building and technical assistance on energy efficiency, including more efficient use of fuels for transportation
- Residential sector applications, including national and regional programs. Residential sector programs address roof insulation programs and replacement of inefficient equipment—lighting, refrigeration, air conditioning, and others.
- An additional national measure was the implementation of daylight savings time.

A consensus is developing among a number of stakeholders in Mexico, including government and Congress, that there are currently insufficient tax incentives and projects to increase in the contribution from renewable energy sources— both in absolute and relative terms. Stakeholders also agree on that the Ministry of Energy is taking action to support the development of new legal, regulatory, and financial instruments that are compatible with the current electricity law. Further action is required to:

- Develop adequate legal frameworks for renewable energy.
- Pass a new law, by Congress, for the promotion of renewable energy.
- Develop regulatory instruments to deploy renewables, including self-supply schemes.
- Create stringent energy efficiency standards.
- Establish an institutional framework with local governments and facilitate/support of local initiatives.
- Engage multilateral and bilateral cooperation to develop methodologies.
- Develop financial and fiscal incentives for project investments.
- Support the development of CDM projects.

Peru

Energy goals in Peru promote the sustainable and competitive development of the energy sector. These include:

- Priorities for private investment and diversification of the energy matrix, with minimal subsidies, in order to efficiently and effectively meet energy requirements, enable the development of productive activities, and improve the quality of life of the population.
- Promoting preservation and conservation of the environment by energy enterprises, thereby encouraging harmonious relationships between these entities and civil society.
- Establishing, executing, and supervising policies in order to have a transparent, efficient, and effective organization that allows for the achievement of its mission through systematic and informed processes. This will involve highly motivated and

qualified personnel and a culture of planning oriented towards quality end user services.

Specific objectives include:

- Identify technical and regulatory conditions necessary for an adequate performance of the electricity sub-sector. This includes a reliable fuel supply, the rational and efficient use of energy resources, and deployment of renewable energies to preserve the environment.
- Promote rural electrification and the productive use of electricity and renewable energies.
- Encourage private investment in generation, transmission, and distribution of electricity; rural electrification projects; and expanded electric systems and networks in the country.
- Review existing norms in accordance to the country's best interests.
- Implement projects that fall under CDM and promote the rational use of the country's energy resources.
- Promote the productive uses of electricity to increase income levels in rural areas, achieve sustainability of an efficient electricity supply, and become an important component in the fight against poverty in rural areas of the country.

Peru's installed capacity is divided evenly between hydroelectricity and conventional thermal electricity, accounting for 82% of Peru's total electricity supply generation. Hydroelectric facilities provide the primary energy source, with thermal plants supplying power during peak usage or when natural conditions dampen hydroelectric output. Other renewable energy sources beyond hydroelectric power are in the early stages of development. The Peruvian government developed a law for the electrification of rural and isolated communities, the General Law for Rural Electrification. This law declares that the development and use of renewable energy resources such as solar, wind, geothermal, hydro, and biomass are of national interest. It aims to increase electrification by enhancing connection in areas with grid access, expanding the grid, and the utilizing mini-hydro and small energy systems. Although this law applies to rural areas, it should be ensured that all these rural areas equitably benefit from the policies and related programs. Existing programs choose projects based on economical or social viability.

There are a series of projects/funds addressing renewable energy use and rural electrification in Peru, with two major initiatives. First, the Executive Directorate of Projects (DEP), has an assigned budget earmarked for the execution of 374 projects which are comprised of transmission lines, small electricity systems, and small hydro facilities. DEP is expected to benefit 4.3 million people.

Second, the National Rural Electrification Fund, FONER, which aims to benefit 160,000 rural households or approximately 800,000 residents. The use of these funds will affect 135,000 households through grid extension and 25,000 households through renewable energy projects. The project's global environmental objective is to achieve reduction of

greenhouse gas emissions through use of renewable energy in electricity generation. The Project has five main components:

- Investment in rural electrification sub-projects by private and state-owned enterprises. This is supported by central government subsidies that provide new electricity connections for rural households, businesses, and public facilities using both conventional grid electricity and renewable energy systems serving dispersed or remote populations.
- Technical assistance to catalyze private sector participation, create capacity for a demand driven approach for rural electrification (projects proposed by service providers in coordination with local communities and governments), and promote renewable energy;
- A pilot program to promote productive uses.
- A small hydro generation financing facility to provide project financing for grid-connected plants, during the construction and initial operation period.
- Project management.

As a way to diversify its energy matrix, Peru has a Promotion of Biofuels Market law. This law aims to diversify the biofuels market, promote the agricultural sector, create jobs, decrease environmental pollution, and create an alternative market in the fight against drugs. This law mandates 5% blending of biofuels into gasoline and 7.8% ethanol, and a committee of technical norms. The Biofuels Use Promotion Program (PROBIOCOM) promotes investments in the production and commercialization of biofuels and the economic, social, and environmental advantages derived from its use. Ethanol from sugar cane and biodiesel from African palm tree facilities operate in the country and various others are under experimental and pre-investment phase.

Assistance is needed in improving the legal framework and the development of an action plan/program that articulates and optimizes rural electrification investments. Peru needs capacity and financing support in promoting renewable energy benefits and applications, including solar, wind, biomass, and micro hydro technologies. Peru is also in need of assistance in advancing productive uses of renewable energy in rural areas and evaluating the effects of these activities from a social, economic, and environmental perspective. Although Peru has an existing large renewable energy capacity and expansion plans in rural areas, opportunities also exist for large-scale grid connected projects to avoid meeting future energy demand from fossil fuels.

In the area of biofuel development, although some ethanol and biodiesel production projects are in the investment and production phases, opportunities from other crops are still experimental. To ensure increased production and use in the country, further information exchange and testing on biofuels is required. The country will also need to examine the existing infrastructure and transportation fuel market before determining necessary policy reform.

Also in Peru, energy efficiency initiatives need development, including demand and supply side management in the building, industrial, transport, utility, and residential sectors.

Guidelines for standards and labeling should be included to increase energy efficiency awareness and adoption. Institutions will also need to set and modify standards, conduct regular audits, and enforce energy efficiency measures to ensure compliance in all sectors.

4. Conclusions

There is no silver bullet for putting in place policy and regulatory reforms to advance the use of renewable energy and energy efficiency. The types of instruments selected should be based on specific energy sector goals and objectives. The effectiveness of a particular policy will rely on how well it is designed and enforced. Further, it is important that renewable energy and energy efficiency be incorporated as early as possible into broader energy sector planning and decision making, and not be an after thought.

Renewable energy development requires a range of market push policies to increase supply of these technologies, and market pull to increase their demand. Push and pull policies are not mutually exclusive and working with a variety of policies may be best. Mega policies, to include RPS, feed-in tariff, can tendering, require mandatory access to grid and long-term secure payment. The use of financial incentives is important as they account for externalities and diversification of renewable energy in power sector planning. To deal with renewable energy incremental costs, these can be passed on to consumers, addressed thru a system benefit charge, or paid by a carbon tax.

For energy efficiency, policies should also be long-term in nature and encourage proper market and pricing signals. Legal and institutional frameworks need to be supportive and remove market distortions that favor conventional sources. Regulatory interventions are required to implement norms and certification programs; monitoring and enforcement is appropriate. Policies must consider both demand and supply aspects, and mandatory and voluntary measures are working in the market. In many instances, state and local governments can be as important as the national government in putting in place policies and regulations to advance energy efficiency in their locales.

A number of policy measures exist to enhance the use of energy efficiency. In most cases these are targeted towards a particular sector, to include industrial, residential, commercial, utility, and transport sector. Examples of the types of policy measures employed are energy efficiency codes, standards, and labeling; mandatory energy efficiency targets; financial incentives, such as tax incentives, low interest loans, and targeted subsidies (used judiciously, transparently, and with a clear exit strategy); bulk procurement programs and competitions; and voluntary agreements, among others. In addition, information and outreach, knowledge sharing, and carbon market assistance is also useful.

Each of the five countries addressed by SEPI—Argentina, Dominican Republic, Guatemala, Mexico, and Peru—have policies, regulations, programs, and projects in various stages of development and implementation to advance their use of renewable energy and energy efficiency. Additionally, in all the countries, biofuels is emerging as important area and will require additional policy support to be developed in a sustainable manner for both domestic use and export.

All of the countries expressed interest and support for continued information exchange to share their activities, experiences, and lessons learned. Additionally, they indicated interest in continued involvement and engagement of the OAS to provide value-added assistance

on effective implementation of existing policies, laws and regulations; creation of new policies and regulations; monitoring and evaluating impacts of these activities; and documenting, reporting, and sharing experiences in the LAC region.