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ENERGY EFFICIENCY & ACCESS FORUM

ENERGY EFFICIENCY AND ACCESS FORUM REPORT

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ENERGY EFFICIENCY AND ACCESS FORUM REPORT

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ANNEXES

I. INTRODUCTION

The Energy Efficiency and Access Forum was jointly organized by the Secretariat of Energy of Mexico, the World Bank and the Inter-American Development Bank, with the support of the Spanish Fund for Latin America and the Caribbean and the World Economic Forum. The Forum was held on September 28 and 29, 2010, in the Secretariat of Foreign Relations in Mexico City.

It was an international gathering focused on sharing experiences and best practices related to the implementation of energy efficiency and energy access programs and projects, public policies and technologies. The Forum focused on three central themes: norms and standards, training and awareness, and successful programs.

It served as a platform for dialogue about a sustainable energy future and created synergies with different initiatives, such as the Energy and Climate Partnership of the Americas, the International Partnership for Energy Efficiency Cooperation and the United Nations Secretary-General's Advisory Group on Energy and Climate Change.

ORGANIZERS AND ACKNOWLEDGEMENTS[1]

The organizers would like to express their gratitude to the three institutions in charge of developing the event, whose efforts made the Energy Efficiency and Access Forum possible:

- Secretariat of Energy
- World Bank
- Inter-American Development Bank

The Forum is also deeply grateful to the Secretariat of Foreign Relations for its hospitality, support and patronage, as well as to the World Economic Forum for its assistance.

The Energy Efficiency and Access Forum was also sponsored by the following institutions:

- Spanish Fund for Latin America and the Caribbean
- Federal Electricity Commission
- United Nations Industrial Development Organization
- United States Department of State
- UN Foundation

The organizers consider it important to mention that the Executive Notes on Energy Efficiency and Access Policies by Countries were developed based on reports by the Economic Commission for Latin America and the Caribbean, and are grateful to this institution for its collaboration.

[1] For further details, please check Section V. ACKNOWLEDGEMENTS.

OBJECTIVES

1. To support the international dialogue on energy efficiency and access to modern energy services.

2. To explain why energy efficiency measures are one of the most important instruments for dealing with the increase in global energy demand, and their ability to contribute to improving energy security, boost competitiveness, generate jobs, increase the reliability of energy systems, reduce vulnerabilities related to the rise and volatility of energy prices, and decrease greenhouse gas emissions.

3. To insist on the need to increase access to modern energy services, a key element for boosting economic development, quality of life and productivity.

4. To showcase the energy sector's commitment to sustainable development, highlighting the importance of energy efficiency measures for mitigation of and adaptation to climate change.

5. To articulate the contribution of Mexico's and the Latin America and the Caribbean region's energy sector to addressing global climate change in the context of the 16th Conference of the Parties to the United Nations Framework Convention on Climate Change.

PARTICIPANTS

The audience included ministers and officials responsible for energy efficiency and access in Latin America and the Caribbean, specialized institutions, high-level representatives from the private sector, development banks, academia and international organizations.

There were 453 participants from the following countries:

- Antigua and Barbuda
- Argentina
- Austria
- Belize
- Bolivia
- China
- Colombia
- Costa Rica
- Dominica
- Dominican Republic
- Ecuador
- Egypt
- El Salvador
- France
- Guatemala
- Guyana
- Honduras
- India
- Italy
- Jamaica
- Japan
- Mexico
- Nicaragua
- Panama
- Paraguay
- Peru
- Saint Kitts and Nevis
- Saint Lucia
- Saint Vincent and the Grenadines
- Spain
- Switzerland
- Tanzania
- Thailand
- The Netherlands
- Trinidad and Tobago
- United Kingdom
- United States
- Uruguay
- Venezuela
- Vietnam

The international organizations present at the Forum were:

- Andean Development Corporation
- BUN-CA
- Caribbean Catastrophe Risk Insurance Fund
- CARICOM
- Collaborative Labeling and Appliance Standards Program
- Economic Commission for Latin America
- Inter-American Development Bank
- International Energy Agency
- International Finance Corporation
- International Partnership for Energy Efficiency Cooperation
- Latin American Energy Organization
- Organization of American States
- UN Foundation
- United Nations Development Programme
- United Nations Industrial Development Organization
- United Nations Organization
- World Bank
- World Economic Forum
- World Energy Council, Mexico Chapter

SESSIONS

- **Opening Plenary Session**
- **Thematic Session 1:** Energy Efficiency Programs, Targets and Action Plans
- **Lunch:** The Role of Energy Efficiency to Increase Access and the Millennium Development Goals
- **Thematic Session 2:** The Role of Standards, Labeling and Codes
- **Thematic Session 3:** The Role of Institutions: Projects, Capacity Building and Public Awareness
- **Thematic Session 4:** Innovative Financing Mechanisms
- **Plenary Session:** Energy Efficiency–The Path Toward Low-Carbon Economies
- **Thematic Session 5:** The Role of Regulators and Utilities Expanding Energy Efficiency and Access
- **Thematic Session 6:** Energy Efficiency and Climate Change Planning
- **Lunch:** Policy Recommendations for Advancing the Energy Efficiency Agenda
- **Thematic Session 7:** Energy Access–International Experiences and Programs

WEACT

In parallel to the Forum, the first "Regional Training Workshop on Design and Implementation of Energy Efficiency Policies" was organized to instruct specialized officials from Latin America and the Caribbean on energy efficiency issues. This event was prepared as part of Mexico's collaboration with the International Partnership for Energy Efficiency Cooperation (IPEEC).

II. CONCLUSIONS AND SESSION SUMMARIES

The following section presents a summary of the key issues discussed and main conclusions of the Energy Efficiency and Access Forum. A synopsis of the speakers by order of presentation is also included at the end of this section. For more information and access to the full presentations from this forum, please go to our website at: http://foroeea.energia.gob.mx/.

MAIN CONCLUSIONS

Introduction

Promoting energy efficiency on both the supply and demand side is critical from the standpoint of energy security, energy access and climate change mitigation. Energy efficiency leads to a triple bottom line: economic and financial benefits (for countries, consumers, and utilities), climate benefits, and local pollution benefits. It also improves competitiveness and provides employment.

Given the expected growth in energy demand, a sense of urgency is required. US$20 to 30 trillion of investments in energy infrastructure across the spectrum (generation, transmission and distribution) will be needed to meet the expected demand over the next 20 years. It is wise to take action now because future costs will be much higher.

A number of measures can be taken right now. Commercially viable energy efficiency technologies are already available for efficient generation and efficient end use. The challenge is to deliver these technologies and realize the technical potential that is not tapped in a business-as-usual context, due to market failures and regulatory and other barriers. Energy efficiency is everyone's business, since every nation will gain from it. It is a win-win option, and the best and ready-made one in the short term when compared to other options.

Barriers

Experience around the world (including exchanges and ideas presented at this Forum) shows that energy efficiency barriers can be overcome through innovative approaches and that market transformation is possible. However, effort is required in terms of financial tools, regulatory policy approaches, raising awareness and setting up the right institutional mechanisms.

Rational pricing of energy, certainty of government incentives (tax incentives) and robustness of policies are means to attract private sector capital into the energy efficiency business, without which it will be impossible to achieve the full potential.

Financing

Financing is important because there are sometimes incremental costs to implement energy efficiency projects and programs, at least in the initial stages. Innovative climate financing mechanisms, including carbon finance, are available at the global level, and other products, such as green mortgages in Mexico, can be used to leverage financing for energy efficiency. There is a role for government and the private sector, but development partners such as the Multilateral Development Banks (MDBs) and UN organizations can also help countries pursue low-carbon roadmaps by providing resources, building capacity, filling in knowledge gaps, improving communication and sharing experiences and best practices.

It is important to highlight the fact that simply having financial mechanisms does not solve the problem. Appropriate policies as well as institutional and regulatory frameworks are required. Policies include measures such as standards and labeling for appliances (already implemented by developed countries), building codes or the setting of industry energy efficiency benchmarks and targets (as China is doing).

Conservation

In addition to energy efficiency investments, there is also a role for energy conservation—behavioral changes—which governments could and should pursue. Consumer awareness and dissemination, along with smart meters and appliances, can help in achieving this potential.

Capacity Building

Even if the financing barrier can be overcome, there will be a critical need for capacity building. MDBs can provide technical and financial support to interested countries through existing capacity-building funds.

Climate Change

Energy efficiency and climate change are interlinked with practical synergies. It may be wise to think of standards and targets as a practical and economic means to achieve climate change mitigation.

Energy efficiency is one of the most effective tools for energy security; it enhances energy access and mitigates climate change. It could happen anyway even if climate change risks are not considered. Aside from developments at Cancun (COP16), countries should work on energy efficiency to achieve a sustainable development path.

Meaningful action in climate change mitigation will only come from a change in energy systems. Among these, energy efficiency is the most viable option in the short term (compared to renewables, clean coal and nuclear). Energy efficiency also presents an opportunity to attract climate change financing resources. It would be a positive outcome to have some of the conclusions from this Forum feed into the climate change discussions. Although energy ministries are not as involved in the climate change negotiations as they could be, due to the relevance of the energy sector in this arena it is important to make the case among negotiators.

Universal Access

Policy makers worldwide agree that increasing access to electricity is urgently needed. Access to electricity is a key condition necessary to improve the quality of life of individuals, to enable the economic development of nations, and to achieve the Millennium Development Goals. Currently, an estimated 34 million people in Latin America and the Caribbean (and 1.4 billion worldwide) lack access to modern energy services. It is projected that the cost of achieving universal access will cost around US$36 billion per year from 2010 to 2030.

A number of policies and models can be pursued to provide electricity services in an effective and sustainable manner. Moving forward, the challenges for policy makers are to identify and implement policies, innovative investment vehicles and financing tools to develop the necessary technology, increase capacity building, ensure that subsidies are well targeted and cost effective, and develop action plans and goals in order to substantially increase the rate of access to electricity.

OPENING CEREMONY
September 28, 09:00–09:45 hrs.

Introduction

The presidium was composed of:

- Patricia Espinosa, Secretary of Foreign Relations, Mexico.
- Rajendra K. Pachauri, Director-General, The Energy and Resources Institute.
- Kandeh K. Yumkella, Chair, UN Secretary-General's Advisory Group on Energy and Climate Change and Director-General, United Nations Industrial Development Organization.
- Richard Samans, Managing Director, World Economic Forum.
- Santiago Levy, Vice President, Sectors and Knowledge, Inter-American Development Bank.
- Juan Rafael Elvira, Secretary of the Environment and Natural Resources, Mexico.
- Sri Mulyani Indrawati, Managing Director, World Bank.
- Georgina Kessel, Secretary of Energy, Mexico.

Summary of key ideas by order of presentation

Patricia Espinosa, Secretary of Foreign Relations, Mexico.

- Energy efficiency presents a series of benefits: environmental, social and economic. All countries have to expand action on this matter.
- The United Nations Conference on Climate Change to be held in Cancun by the end of the year may be the beginning of a new era on climate change action. Mexico will seek to bring positions closer and generate concrete and tangible agreements. Energy efficiency should be part of an emerging agenda in the framework of this multilateral process.

Santiago Levy, Vice President, Sectors and Knowledge, Inter-American Development Bank.

- Energy efficiency has repercussions in two ways: climate change and countries' productivity and efficacy in using their energy resources and comparative structural advantages.
- The lack of progress in energy efficiency issues would mean gradually losing the region's competitive advantages.
- The Inter-American Development Bank is promoting this agenda in two ways: creation of an energy innovation center and channeling of financial resources through loans and guarantees.

Juan Rafael Elvira, Secretary of the Environment and Natural Resources, Mexico.

- The results of the event may have a positive effect moving toward COP 16. Solving climate change requires the participation not only of governments at all levels, but also of the private sector.
- In August 2009, President Felipe Calderón published the Special Program on Climate Change, which has the primary goal of reducing annual carbon dioxide emissions by 50 million tons by 2012.
- The Secretariat of the Environment and Natural Resources has sought to improve energy efficiency in the industry through voluntary national regulations in the public and private sectors.

Sri Mulyani Indrawati, Managing Director, World Bank.

- The region will need to double electricity generation capacity over the next 20 years, which could require investing US$20 billion.
- The World Bank has created various instruments to support the development of energy efficiency measures in Latin America and the Caribbean.
- Other nations have been able to reduce their emissions through these provisions. It is still necessary to provide modern energy services to 30 million people in the region.
- The Bank is prepared to provide needed financial tools and technical assistance to support countries in the area.

Georgina Kessel, Secretary of Energy, Mexico.

- The rational use of energy is an opportunity to strengthen the energy sector's positive impact on various spheres of society, promote economic growth and protect the environment.
- Electricity demand in the region will grow on average 1.4 percent per year over the next decade. To meet this increase, countries will have to invest US$53 billion, although energy efficiency measures could reduce consumption by 10 percent, requiring investments of only US$16 billion.
- The energy sector contributes significantly to climate change and therefore it must become an important part of the solution to this problem.
- 1.5 billion people in the world (34 million in Latin America and the Caribbean alone) lack access to modern energy services.
- According to the Economic Commission for Latin America and the Caribbean, the region will need to invest US$10 billion over the next seven years to ensure access to energy for all inhabitants.
- Mexico is taking firm steps toward building a new energy efficiency culture.
- Forum participants should learn from different experiences, innovate, and have better coordination to establish more effective policies and strategies that enable increased energy savings.

OPENING PLENARY SESSION
September 28, 10:00–11:30 hrs.

Introduction

The Session was chaired by Georgina Kessel, Secretary of Energy of Mexico. The keynote speakers were:

- Rajendra K, Pachauri, Director-General, The Energy and Resources Institute: *Energy Efficiency and Climate Change*.
- Pamela Cox, Regional Vice President, Latin America and the Caribbean, World Bank: *A Global View on Energy Efficiency*.
- Santiago Levy, Vice President, Sectors and Knowledge, Inter-American Development Bank: *Energy Efficiency in the Americas*.
- Kandeh K. Yumkella, Chair, UN Secretary-General's Advisory Group on Energy and Climate Change and Director-General, United Nations Industrial Development Organization: *Energy Efficiency Roadmap and Perspectives*.

Objectives:

- To present the Energy and Climate Partnership of the Americas and the opportunities to create synergies among other initiatives, such as the International Partnership for Energy Efficiency Cooperation and the UN Secretary-General's Advisory Group on Energy and Climate Change.
- To learn from successful energy efficiency programs.
- To move forward with the energy efficiency agenda in Latin America and the Caribbean.
- To discuss the links between energy efficiency and climate change.

Summary of key ideas by order of presentation

Georgina Kessel, Secretary of Energy, Mexico

- The goal is to present initial thoughts on the current situation and challenges associated with energy efficiency and the lack of access to modern energy services in Latin America and the Caribbean.

Rajendra K, Pachauri, Director-General, The Energy and Resources Institute: *Energy Efficiency and Climate Change*.

- The world should focus on energy efficiency and ensuring access to energy.
- The increase in greenhouse gases emissions (GHGs) in the twentieth century has led to an increment of 0.4 degrees Celsius in global temperatures and 17 centimeters in sea levels, as well as causing unpredictable weather events and having negative impacts on human and animal health.
- Tackling this problem will require major investments.
- Different projections set the increase in GHG emissions from 8 to 30 gigatons by 2030.
- So far the market has not internalized climate change costs into the economy.

- The sectors in which emissions can be reduced and efficiency could be increased are buildings, followed by power generation; agricultural and industrial segments also stand out. The appropriate capacities and incentives will need to be built in order to direct action to proper objectives.
- The solar panels program implemented by The Energy and Resources Institute in India has provided electricity to a million homes in areas without prior access.

Pamela Cox, Regional Vice President, Latin America and the Caribbean, World Bank: *A Global View on Energy Efficiency*.

- Electricity distribution losses alone in the region in 2005 were equal to the entire electricity consumption of Argentina, Chile, and Colombia combined during this same year. Reducing these in the next 20 years could satisfy about 6 percent of the initial energy required.
- Energy consumption in the region will grow 3 percent annually over the next 15 years, but since the region has a faster economic growth rate, electricity production should double, meaning that increasing efficiency will clearly have benefits.
- About 40 million people still lack access to electricity in the region.
- Various barriers halt increases in energy efficiency, such as technical, regulatory or financial issues, and are politically difficult to carry out, especially in the long term.
- In recent years the World Bank has developed 360 projects on this issue in 90 countries. Last year alone, the Bank invested about US$3 billion in energy efficiency actions, around 10 percent of total investments.
- Funding is not enough; institutional and regulatory frameworks are necessary, as well as incorporating the private sector because of its condition as a major energy consumer and possible funding source.
- Mechanisms to finance technological innovations and those businesses that create them are also needed.
- Both the public and private sectors should create financial instruments and incentives to work in this area.
- It is necessary to better communicate the benefits of energy efficiency.
- Over the last decade, the region has seen its greatest economic growth in the last 30 years. It should continue this development with more sustainable energy sources.

Santiago Levy, Vice President, Sectors and Knowledge, Inter-American Development Bank: *Energy Efficiency in the Americas*.

- It is important to question why no greater actions on energy efficiency have been made, considering the fact that everyone is convinced of its benefits. This could be due to three key issues:
    1. Regulatory aspects. With proper regulations, US$36 billion could be saved in the region. This is a win-win situation in sectors such as transportation, public lighting, and lighting. However, it is unlikely that regulation alone is the answer to the problem.
    2. The relative price of energy does not reflect its true scarcity. There is a systemic market failure, so the second topic to work on is relative prices. The public policy challenge in this area is how to tell society that fossil fuel-intensive energy prices will be higher in the future, so they should start to be internalized today.
    3. Social problem. Many governments in the region have used energy prices as distributive mechanisms. There is an important opportunity for social programs that promote energy efficiency and solve access to credit problems for low-income families.

Kandeh K. Yumkella, Chair, UN Secretary-General's Advisory Group on Energy and Climate Change and Director-General, United Nations Industrial Development Organization: *Energy Efficiency Roadmap and Perspectives*.

- The industry represents one-third of energy use.
- Energy demand in developing countries will continue growing, as World Bank studies show, because more energy is used to produce the same amount of goods as in developed countries.
- A study to be published next year will show that it will be necessary to improve energy efficiency to halve carbon dioxide emissions.
- Some countries, such as China and India, are already taking action because of energy security issues.
- By 2030, universal access to energy must be provided to two billion people, and energy intensity should be reduced by 40 percent, which represents an increase in efficiency of 2 to 5 percent per year.
- Some parts of the world are already thinking about low-carbon industrialization.
- Making these changes is complicated due to the need for government policies. Society must also modify its behavior; some figures suggest that this may represent around 25 percent of necessary actions.

THEMATIC SESSION 1: ENERGY EFFICIENCY PROGRAMS, TARGETS AND ACTION PLANS
September 28, 12:00–13:30 hrs.

Introduction

The session was chaired by Leandro Alves, Chief of the Energy Division at the Inter-American Development Bank. The panel speakers were:

- Yongqian Liu, Energy Advisor, Energy Research Institute, National Research and Development Commission, People's Republic of China: *Chinese Experience–Energy Efficiency Targets and Action Plans*.
- Andrew Steer, Special Envoy for Climate Change, World Bank: *Energy Efficiency in the Context of Climate Change Negotiations*.
- Emiliano Pedraza, Director-General, CONUEE, Mexico: *Mexico's National Program for the Sustainable Use of Energy*.
- Sergio F. Garribba, Counselor for Energy Policy, Ministry of Economic Development, Italy: *The International Partnership for Energy Efficiency Cooperation*.

Objectives:

- To present successful energy efficiency programs, targets and action plans being implemented around the world.
- To learn from best practices and key elements to scale up energy efficiency programs.
- To discuss lessons from the design, implementation and oversight of programs, action plans and targets.
- To present reports on energy efficiency across different countries, companies and international organizations.
- To discuss the context of the climate change negotiations.

Summary of key ideas by order of presentation

Yongqian Liu, Energy Advisor, Energy Research Institute, National Research and Development Commission, People's Republic of China: *Chinese Experience–Energy Efficiency Targets and Action Plans*.

- China's goals regarding energy efficiency and emissions reduction are:
    - Energy efficiency goals for 2010: Reducing the energy required by unit of gross domestic product (energy intensity) by 20 percent (base year: 2005).
    - Emissions reduction goal to 2020: Reducing the emissions of CO_2 of the GDP by 40–45 percent (base year: 2005).
- Concrete actions carried out by the Chinese Government are:
    - Development of laws
    - Adjustments in the economic structure
    - Economic incentives and marketing instruments
    - Fiscal subsidies
    - Development of capacities and energy savings awareness
    - Coordination between the central government and local governments

- Monitoring of energy consumption in the public and private sectors
- Certification to decrease energy consumption in the country's most intensive industries (cement, steel, iron, ammonia, non-ferrous materials, electric generation, transportation, construction, real estate).

Andrew Steer, Special Envoy for Climate Change, World Bank: *Energy Efficiency in the Context of Climate Change Negotiations*.

- The stakes for energy efficiency are very high and the case for savings is also very high. Of the US$35 trillion of investment needed to meet energy growth, energy efficiency could help save a large amount of money.
- It is possible to grow faster and save on energy costs and at the same time lower emissions.
- The negotiations on climate change present an opportunity to help us grow more efficiently. This could provide the motivation, measurement and money needed to mobilize support, to set and measure targets, and to make more resources available.
- It is necessary to have a different perspective in order to perceive links between climate change and energy efficiency.
- If a country's population believes that climate change is real, this can be useful for energy efficiency actions and results in saving resources and decreasing emissions.

Emiliano Pedraza, Director-General, CONUEE, Mexico: *Mexico's National Program for the Sustainable Use of Energy*.

- Mexico has analyzed final energy consumption by 2030 in the transportation, industrial, agricultural and residential-commercial-public sectors.
- The transportation sector is the area of opportunity with greatest energy consumption and has an extensive number of available technologies. Lighting, although it is not such a large sector, is the area of opportunity with the greatest energy efficiency potential among the different technology options.
- Based on a GHGs abatement potential curve, Mexico has identified seven areas of opportunity (lighting, transportation, appliances, co-generation, buildings, industrial engines, water pumps) with specific courses of action (considering technological change and users' behavior).
- Mexico is working on developing energy efficiency standards for vehicles, lighting and thermal insulation (residential, commercial and industrial), electrical appliances and building equipment. It is also promoting the replacement of lightbulbs; supporting marginalized groups (refrigerators and air conditioner replacements); certifying equipment and appliance certification so that these comply with high energy efficiency standards; certifying new residences; recognizing people and businesses that are promoting energy efficiency; disseminating the advantages of co-generation; supporting programs for small- and medium-sized companies; and rehabilitating and providing water pumps in the agricultural sector.
- If all of these actions were to be implemented in the country, by 2030 the final consumption of energy would drop by 18 percent and the aggregated result (more than 4,000 terawatts-hour) would be equivalent to more than two years of annual consumption.

Sergio F. Garribba, Counselor for Energy Policy, Ministry of Economic Development, Italy: *The International Partnership for Energy Efficiency Cooperation*.

- The initiative seeks to promote forward world action on energy efficiency through the development of capacity building and training. It is composed of 15 countries, some of which belong to the G-8.
- Its main objectives are to: a) share existing energy efficiency policies with decision makers, b) develop institutions and tools for government officials, c) support the identification and elimination of loopholes in current energy efficiency programs, and d) foster agreements among countries to promote policies and programs.
- It is organized through six action groups with different tasks (plans and cross-sectoral issues, transportation, construction, public lighting and appliances, industrial sector, essential public services).
- The expected results are the establishment of a global energy efficiency policy network in order to share knowledge through action groups, organize subregional and regional workshops together with high-level political forums, and identify and disseminate energy efficiency policies toward Cancun and beyond.

LUNCHEON KEYNOTE SPEECH: THE ROLE OF ENERGY EFFICIENCY TO INCREASE ACCESS AND THE MILLENNIUM DEVELOPMENT GOALS
September 28, 13:30–15:00 hrs.

Introduction

The session was chaired by Georgina Kessel, Secretary of Energy, Mexico. The keynote speaker was:

- Kandeh K. Yumkella, Chair, UN Secretary-General's Advisory Group on Energy and Climate Change and Director-General, United Nations Industrial Development Organization.

Objectives:

- To discuss the rationale for promoting energy access (welfare and economic benefits).
- To present the status of energy access in the continent and progress toward meeting, in 2015, the Millennium Development Goal 7: "Ensure Environmental Sustainability–Response to Climate Change".
- To exchange ideas about the initiatives being implemented to increase the delivery of energy services.
- To talk about the contribution of energy efficiency to promote access to modern energy services by reducing affordability barriers.
- To exchange viewpoints on how to increase affordability of efficient technologies/products for low-income populations.

THEMATIC SESSION 2: THE ROLE OF STANDARDS, LABELING AND CODES
September 28, 15:15–16:15 hrs.

Introduction

The session was chaired by Emiliano Pedraza, Director-General of the National Commission for the Efficient Use of Energy (CONUEE) of Mexico. The panel speakers were:

- Richard Jones, Deputy Executive Director, International Energy Agency: *The Global Harmonization Experience*.
- Christine Egan, Executive Director, Collaborative Labeling and Appliance Standards Program (CLASP): *Energy Efficiency Standards and Labeling in Latin America–The Way Forward*.

Objectives:

- To present best practices on energy efficiency measures such as standards, labeling and codes.
- To discuss a framework for harmonizing standards within the region.
- To confer on when to use standards as a means toward better energy efficiency and when to use other types of regulation/mandatory measures/incentives.
- To agree on key topics to advance the regional energy efficiency agenda through the development of:
    i. A Regional or Global Energy Efficiency Certification Center;
    ii. Implementation of regional energy efficiency standards (or bilateral standards);
    iii. Harmonization of standards in Latin America and the Caribbean (along the lines of free trade agreements); and
    iv. Promotion of regional trade of energy efficiency products based on the existing framework in free trade agreements.

Summary of key ideas by order of presentation

Emiliano Pedraza, Director-General, CONUEE, Mexico.

- Standards, labeling and codes are some of the most effective instruments that governments can use to implement energy efficiency policies.
- Standards and labeling can be even more effective when implemented along with other policies, such as economic incentives to promote new technologies, and strategies to educate consumers on the importance of and need for more energy-efficient services and products.

Richard Jones, Deputy Executive Director, International Energy Agency: *The Global Harmonization Experience*.

- To understand why greater energy efficiency is important, we need to take a holistic approach and examine the global energy system.
- Major economies are projected to account for 70 percent of growth in energy demand and CO_2 emissions between now and 2030.

- Total primary energy supply of non-OECD countries is projected to increase at a disproportionate rate by 2030 and 2050. This in turn would result in greater gas and oil imports and in drastic price increases.
- When trying to achieve the targets of the IEA's BLUE Map scenario (to bring CO_2 emissions down to 14 Gt), a portfolio of technologies is needed to achieve a global energy revolution (i.e., CCS, renewable, nuclear, power generation efficiency and fuel switching, end-use fuel switching, end-use fuel and electricity efficiency)
- End-use efficiency can provide 38 percent of the reductions, but CCS, renewable and nuclear are needed in the power sector.
- In addition, there is a need to make the transport sector more efficient. Under the BLUE Map scenario, by 2050, coal, oil and gas demand levels are lower than today's demand levels.
- Need to transform markets for clean energy products. This is where standards and labeling can play an important role.
- Benefits of Standards and Labeling (SandL) include:
    - They are very cost effective.
    - They require change in the behavior of a manageable number of manufacturers rather than all consumers.
    - They treat all manufacturers, distributors and retailers equally.
    - They provide large measurable energy savings that are comparatively easy to quantify and verify.
- Many countries are already applying SandL programs, and these have proved to be effective. Global cooperation is needed to accelerate market transformation. SandL policies offer one of the best prospects for global cooperation.
    - Countries can jointly coordinate program design to send a clear, performance-based signal.
    - Countries can use coordinated financial incentives to encourage manufacturers to scale up production of super-efficient products.
    - Countries can work together in areas of monitoring, verification and enforcement, because this is the most cost-effective option to further unlock the economic potential existing within SandL schemes.

Christine Egan, Executive Director, CLASP: *Energy Efficiency Standards and Labeling in Latin America –The Way Forward*.

- Over 75 countries have energy standards and labeling. This growing trend is taking over Latin America and the Caribbean as energy efficiency is going mainstream in the region.
    - Energy efficiency standards and labeling have played an important role in energy efficiency programs.
- With additional and more stringent SandL programs, Latin America has the potential to reach 141 annual metric tons of CO_2 reduction in 2030.
- There are two types of SandL programs in Latin America:
    - Primary focus on Minimum Energy Performance Standards (MEPS). This type of labeling is considered as a complementary instrument.
    - Countries such as Mexico (following the US model) and Venezuela (partially) have taken on this approach.
    - Initial focus on labeling (MEPS are implemented as a second step, based on an operational labeling program).
    - In the case of Brazil, this started as a voluntary program which later became mandatory, and this model has been followed by many South American countries.
- Because Latin American SandL programs are influenced by those of the US and the EU, SandL alignment is still the rule today, whereas regional harmonization experiences have had limited

success.

- Along with the trend of labeling programs starting from voluntary and moving to mandatory, labeling programs are shifting to MEPS.
- As labeling becomes mandatory, there is a greater range of appliances and equipment covered by energy efficiency SandL programs.
- As SandL programs become more mainstream, system standards are taking on more innovative approaches, such as taking into consideration human behavior.
- In addition, many countries in Latin America are implementing inventive programs and/or replacement programs for appliances.
- Although more countries are implementing SandL programs, there is still vast room for improvement, which in turn can help maximize potentials. In addition to technical assistance, there are also ample opportunities for regional cooperation among national programs.

THEMATIC SESSION 3: THE ROLE OF INSTITUTIONS: PROJECTS, CAPACITY BUILDING AND PUBLIC AWARENESS
September 28, 16:15–17:15 hrs.

Introduction

The session was chaired by Carlos Flórez, Executive Secretary of the Latin American Energy Organization (OLADE). The panel speakers were:

- Lucio Monari, Sector Manager, Energy, World Bank: *A Global Perspective*.
- Joseph Williams, Manager, Energy Program, CARICOM: *Challenges of Small Island Economies*.
- Leandro Alves, Chief, Energy Division, Inter-American Development Bank: *IDB–ENE Innovation Center and the ECPA EE Centers*.
- Teófilo de la Torre, Minister of the Environment, Energy and Telecommunications, Costa Rica: *Costa Rica Energy Efficiency Training Center*.

Objectives:

- To learn about best practices for capacity building and public awareness.
- To discuss case studies.
- To confer on institutional design and compliance mechanisms.

Summary of key ideas by order of presentation

Carlos Flórez, Executive Secretary, OLADE.

- Institutions (federal or local governments, energy efficiency certification centers or institutions, public service companies, manufacturers, NGOs or international organizations) play a decisive role in the application and definition of energy efficiency frameworks.
- It is important to also consider ways to strengthen assistance capacities in these institutions, as well as ways to bolster institutional capacities to implement and apply energy efficiency policies.

Lucio Monari, Sector Manager, Energy, World Bank: *A Global Perspective*.

- Given the importance of energy efficiency, regulatory, policy and market interventions have been created as well as various financing mechanisms. Institutional entities play a fundamental role because they can influence market transformation and policies.
- Some findings and lessons learned for enhancing the role of energy efficiency institutions are:
    - Many energy efficiency barriers are common across countries. These could be addressed by similar policies and regulations. However, because there is a diverse range of institutional structures, governance can be difficult.
    - There is an increasing recognition of the importance of private sector participation in energy efficiency market transformation.

- There are several institutional determinants within each country (institutional framework, institutional structure, elements of governance). Depending on how well these factors come together, they will in turn affect energy efficiency performance.
- The primary motivation for implementing energy efficiency should be country-driven priorities:
    - The motivation of developed countries tends to focus on energy security and climate change/emission targets, while developing countries tend to be motivated by the need to improve energy access and energy security, reduce energy import costs, etc.
- Top political commitment to energy efficiency policies is a key element.
    - Energy efficiency agencies created as an outcome of legislative processes provide the legal underpinning and necessary framework for their operation.
- Energy efficiency policies, laws and regulations should be developed based on a shared vision among stakeholders.
- Coordination and transparent collaboration between multiple energy efficiency institutions and market players and between national/state/provincial agencies and private sector stakeholders can help enhance institutions and governance.
- There is a need to improve data availability and to count on appropriate energy efficiency metrics and indicators.
    - Together with credible monitoring and evaluation plans, institutions can more effectively formulate, prioritize and assess the impact of energy efficiency policies.

Joseph Williams, Manager, Energy Program, CARICOM: *Challenges of Small Island Economies*.

- Most of the challenges being faced by the Caribbean region are related to energy efficiency.
- CARICOM Small Island Developing States (SIDS) face several challenges:
    - They are small states, separated by sea; each state has diverse/different resources and structures, have relatively high indebtedness, and are prone to natural disasters.
    - These challenges need to be kept in mind when thinking of energy efficiency in the Caribbean.
- Given Haiti's current state, energy access in CARICOM has also become a challenge.
- Despite the challenges and hurdles, there have been successful cases in some countries in the region.
- In order to have more successful energy efficiency programs/policies in CARICOM, these countries need:
    - Successful energy efficiency projects in the building sector for case studies.
    - Improved regulatory framework (utility and market).
    - Regionwide appliance labeling program, standards for the transportation sector, energy efficiency building codes and standards.
    - Innovative financing.
    - More high-quality energy efficiency information.
    - Individual and institutional capacity building and strengthening.

Leandro Alves, Chief, Energy Division, Inter-American Development Bank: *IDB–ENE Innovation Center and the ECPA EE Centers*.

- Previous presentations have demonstrated the limitations or challenges when promoting energy efficiency in the energy and other sectors.
    - Some of the challenges/obstacles are: little transfer of knowledge/information, regulatory limitations, lack of government support for energy efficiency, financing and incentive structures, etc.

- Taking this into consideration, the US Department of Energy (US DOE) and the Inter-American Development Bank have been collaborating to address some of these challenges.
- Solid institutional frameworks can influence the sustainability and effectiveness of energy efficiency programs by:
    - Helping to establish incentives for the efficient use of energy resources.
    - Creating financing mechanisms for the development and execution of energy efficiency projects.
    - Easing necessary conditions for private sector involvement.
    - Modifying energy planning processes to include energy efficiency.
    - Creating conditions for mandatory energy efficiency standards and codes.
- The main focus areas for energy efficiency institutional frameworks are:
    - Governance, supervision and legislation.
    - Program administration/management.
    - Provision of services and implementation, and evaluation.
- Keeping in mind the challenges and potential areas of improvement, the Bank and the US DOE created the IDB Energy Innovation Center to promote innovation for energy efficiency, renewable energy, and energy access.
- It will serve as a regional hub that will facilitate interaction among experts, diffusion of knowledge and best practices of the energy sector, and project support through technical assistance and financing/cofinancing opportunities.

Teófilo de la Torre, Minister of the Environment, Energy and Telecommunications, Costa Rica: *Costa Rica Energy Efficiency Training Center*

- Despite its small size, Costa Rica has come a long way in the field of energy. Access to energy is around 99.5 percent, 95 percent of its energy generation derives from renewable sources, and it also has very low transmission and distribution losses.
- The country has set high goals for 2021: it hopes to be carbon neutral and expects to generate 100 percent of its energy from renewable sources.
- Energy efficiency is a very important element when endeavoring to attain these goals.
- Energy efficiency centers play an important role, and Costa Rica has started dialogues with the United States and the Inter-American Development Bank for their creation.
- When creating a center (whether for energy efficiency or renewable energy), it is important to combine the government's decision-making power with the private sector's muscle and the participation of academia. It is this type of collaboration and coordination that will ensure effective and real energy efficiency measures.
    - With various stakeholders involved, it is important to also streamline and align goals and activities.

THEMATIC SESSION 4: INNOVATIVE FINANCING MECHANISMS
September 28, 17:30–18:30 hrs.

Introduction

The session was chaired by Shilpa Patel, Chief of the Climate Change, Environmental and Social Development Department at the International Finance Corporation, and co-chaired by Dominic Waughray, Senior Director and Head of Environmental Initiatives of the World Economic Forum. The panel speakers were:

- Steven J. Puig, Vice President for the Private Sector and Non-Sovereign Guaranteed Operations, Inter-American Development Bank: *Mobilizing Resources for a "Cleaner" Energy Matrix*.
- Héctor Rangel Domene, Director-General, Nacional Financiera, Mexico: *Success Stories*.
- Philippe Benoit, Sector Manager, Energy Unit, Sustainable Development Department, Latin America and the Caribbean Region, World Bank/Chandra Shekhar Sinha, Senior Energy Specialist, Carbon Finance Coordinator: *Financing Climate Action–Potential Innovative Financing Mechanisms*.

Objectives:

- To learn about new developments in financing mechanisms.
- To discuss the role of financial institutions in promoting energy efficiency.
- To present success stories.
- To hear about domestic and international funding sources.

Summary of key ideas by order of presentation

Shilpa Patel, Chief, Climate Change, Environmental and Social Development Department, International Finance Corporation.

- The session seeks to present the financing experiences that have achieved a decrease in transaction costs and also to show the benefits of the implementation of energy efficiency measures.
- It is relevant because, although the implementation of energy efficiency measures is a low-cost opportunity, this is not always a priority for clients. Innovative financing mechanisms aim to overcome this barrier and thereby incentivize the implementation of those measures.

Steven J. Puig, Vice President for the Private Sector and Non-Sovereign Guaranteed Operations, Inter-American Development Bank: *Mobilizing Resources for a "Cleaner" Energy Matrix*.

- There are between 30 to 40 million people without electricity access in the region. In addition, 85 million households use biomass for cooking and heating. By 2030, US$1.8 trillion are required to provide infrastructure in the Latin American energy sector. Eighty-five percent of the investment will be covered by the private sector.
- The Inter-American Development Bank offers a wide range of products for the private sector, from technical assistance in the first stage of the project cycle to different financing tools such as loans; cofinancing; credit lines; investment activities: equity, quasi-equity, investment funds; and guarantee programs.

- Examples of Innovative Solutions are: PlanetBanking, credit Lines for intermediaries, training for executives of commercial banks to identify renewable energy projects; GreenPyME, support for financing projects, among others; scorecards to measure the impact of potential projects, aiming to assure the environmental and social sustainability of the projects. In energy efficiency, Óptima, an ESCO in Mexico has implemented more than 100 projects with the Bank's support.
- Among the innovative financing tools, the funds of the Multilateral Agencies that stand out are, for example: Climate Investment Funds, GEF, IDB Micro-carbon Fund, etc. The Bank aims to designate 25 percent of its total activities to clean and renewable energy. This represents US$3–3.5 billion per year.

Héctor Rangel Domene, Director-General, Nacional Financiera, Mexico: *Success Stories*.

- Among successful cases in financing projects, the following situations can be found: 1) without resources, the payback depends on the project alone; the only resource of the bank is the flow and assets of the project, received as collateral; 2) with limited resources, besides project resources, the financing has a third-party guarantee as a percentage of the total investment.
- Other successful cases are: wind energy projects with the support of the Inter-American Development Bank, the World Bank, KfW and other multilateral agencies; in energy efficiency: (NAFIN-FIDE) replacement of electric appliances with NAFIN credit (program with CFE); assistance to the tortilla industry, which consists of equipment replacement, a four-year credit with a fixed rate of six percent, subsidized by the Secretariat of Economy, which pays $30,000 Mexican pesos for the exchange and destruction of old equipment. Currently, NAFIN is designing credits for small- and medium-sized companies.
- It is also important to talk about FOMECAR, a Bancomext trust fund established in 2006 as a joint initiative with the Secretariat of the Environment and the Centro Mario Molina. The trust fund aims to provide technical assistance for feasibility studies regarding CO_2 emissions in carbon finance projects (with assistance from KfW and the World Bank).

Philippe Benoit, Sector Manager, Energy Unit, Sustainable Development Department, Latin America and the Caribbean Region, World Bank; Chandra Shekhar Sinha, Senior Energy Specialist, Carbon Finance Coordinator: *Financing Climate Action –Potential Innovative Financing Mechanisms*.

- The objective is to propose innovative financing mechanisms that mobilize CERs (certified emission reduction) resources for the financing of current energy efficiency and renewable energy activities.
- Its core principle is that a ton of CO_2 emitted anywhere in the world has the same impact on climate change. Therefore, it must be reduced or mitigated where the cost is the lowest.
- What are on sale are the tons of CO_2 reduced or mitigated by a specific project (AAUs, CERs, ERUs, EUAs, VERs, etc.)
- In COP15, countries agreed to mobilize US$100 billion per year until 2020 for the mitigation of emissions. The challenge is how to mobilize future revenues.
- The idea is to obtain financing in the present, based on potential revenues that will be obtained in the future through CERs.
- This can be done through the creation of Guaranteed CERs (GuaCER) to monetize future CERs. GuaCER is a financing product with which developing countries can sell their reduction in CO_2 emissions to Annex 1 countries through a transaction in an open market. GuaCER provides funds today, in exchange for a future flow of investments in energy efficiency and renewable energy (CERs). GuaCER's proposal is still at a preliminary stage.
- There are potential problems and risks: for instance, transaction costs; buyers and sellers must feel comfortable with the size of the guarantee and other details. Despite the potential problems, GuaCER is an appealing, innovative product to mobilize resources in energy efficiency investments.

PLENARY SESSION: ENERGY EFFICIENCY–THE PATH TOWARD LOW-CARBON ECONOMIES
September 29, 09:00–10:00 hrs.

Introduction

The President of Mexico, Felipe Calderón, gave the keynote speech. Other session speakers were:

- Mario Molina, President, Centro Mario Molina: *The Role of Technology to Address the Challenges of Climate Change*.
- Kandeh K. Yumkella, Chair, UN Secretary-General's Advisory Group on Energy and Climate Change and Director-General, United Nations Industrial Development Organization: *Recommendations for a Sustainable Energy Future*.
- Georgina Kessel, Secretary of Energy, Mexico: *Energy Efficiency–The Path Toward Low-Carbon Economies*.

Summary of key ideas by order of presentation

Mario Molina, President, Centro Mario Molina: *The Role of Technology to Address the Challenges of Climate Change*.

- Energy plays a fundamental role in the economic development of society. The use of fossil fuels has resulted in a change in the chemical composition of the planet's atmosphere, affecting its thermal balance and climate.
- Although any specific event cannot be attributed to climate change, it can be observed that the frequency of floods and extreme events has increased.
- Tackling climate change is a huge challenge that could cost around 1 or 2 percent of the global gross domestic product.
- Mexico has played an important leadership role in advancing solutions for this problem. It is essential for countries to change their way of producing energy through low-emission economic development plans.
- The consensus of experts is to develop various measures simultaneously, including renewable energies, carbon capture and storage and nuclear energy.
- Besides these, the efficient use of energy stands out for two main reasons: appropriate technologies are already available and the associated cost is negative.

Kandeh K. Yumkella, Chair, UN Secretary-General's Advisory Group on Energy and Climate Change and Director-General, United Nations Industrial Development Organization: *Recommendations for a Sustainable Energy Future*.

- An agreement was reached during the Copenhagen summit. It has been signed by over 100 countries to establish a very clear commitment to save the forests, in addition to producing a US$4 billion budget.
- Eighty percent of carbon dioxide emissions result from the production, distribution and use of energy and from the construction sector. COP16 might be the space to decide to act on energy issues. The world cannot be saved from climate change without changing existing energy systems.
- Reducing poverty requires competitive economies that create jobs and provide access to electricity.
- The United Nations will launch a global campaign on energy efficiency.

Georgina Kessel, Secretary of Energy, Mexico: *Energy Efficiency–The Path Toward Low-Carbon Economies*.

- Energy efficiency increases companies' competitiveness, creates jobs and allows governments to reduce subsidies and invest available resources to promote access to energy services.
- Latin American and Caribbean countries are starting their energy transition, rationally exploiting traditional fuels and diversifying primary energy sources.
- The Energy Efficiency and Access Forum should become a space to deepen discussion about the construction of a sustainable energy future.
- Energy efficiency is one of the most important and effective instruments to move toward low-carbon economies. Without progress in this area, countries will have to double their electricity generation capacity over the next 15 years.
- While economies will continue depending to a significant degree on fossil fuels, extracting these resources must be done in an environmental friendly manner.
- This would increase efficiency in all production processes; maximize hydrocarbon use, particularly associated gas; and minimize possible greenhouse gas emissions in the sector's production chain.

Felipe Calderón, President, Mexico.

- Climate change and global warming are real. They affect the poorest people and although they have been caused mainly by developed countries, everyone has to contribute under the established premise of common but differentiated responsibilities.
- Saving energy is not only necessary but also profitable.
- Mexico is convinced that energy efficiency measures are an indispensable and ideal tool to address the increasing global energy demand while ensuring sustainable development.
- The efficient use of energy must be cross-sectoral, in all economic activities.
- Ten action areas to work on:
    1. Promoting the use of renewable energy;
    2. Programs to encourage a massive shift in consumer behavior;
    3. Sustainable designs for buildings and homes;
    4. A transition in lighting technology;
    5. Cleaner fuels and standards to increase their performance;
    6. Rural electrification to achieve universal energy access;
    7. Encouraging co-generation;
    8. Fostering the use of public transport;
    9. Moving toward the implementation of tax incentives for renewable energy, and
    10. Aligning energy prices with their actual costs.

- At COP16, the parties need to assume a sense of urgency on climate issues, as well as real commitment, political will, and above all practical, pragmatic, financial and operational schemes to further enable development and clean technology transfer for both climate change mitigation and adaptation.

THEMATIC SESSION 5: THE ROLE OF REGULATORS AND UTILITIES EXPANDING ENERGY EFFICIENCY AND ACCESS
September 29, 10:15–12:00 hrs.

Introduction

The session was chaired by Alfredo Elías Ayub, Director-General of the Federal Electricity Commission (CFE) of Mexico. The panel speakers were:

The Role of Technology:

- Mark Spelman, Global Head of Strategy, Accenture: *Accelerating Efficiency Through Smart Grids–How to Create Successful Pilot Projects*.
- Chris Curtis, CEO, Schneider Electric North America: *Successful Experiences in Energy Management.*

The Role of Utilities: Challenges for Increasing Energy Efficiency and Access.

- Germán Fatecha, ANDE, Paraguay.
- Ángel Larraga, Mexico Country Manager, Grupo Gas Natural Fenosa.

The Role of Regulators:

- María del Carmen Fernández Rozado, Counselor, National Energy Commission, Spain: *The Regulators' Perspective*.
- Francisco Xavier Salazar, President, Energy Regulatory Commission, Mexico: *Universal Access, Energy Efficiency and Economic Regulation–The Mexican Experience*.

Objectives:

- To present a report on the key elements needed for the deployment of Smart Grid projects.
- To identify options to produce and consume energy more efficiently.
- To acknowledge the opportunities and challenges faced by utilities to improve their efficiency.
- To define the role of utilities in providing universal energy services.

Summary of key ideas by order of presentation

Mark Spelman, Global Head of Strategy, Accenture: *Accelerating Efficiency Through Smart Grids–How to Create Successful Pilot Projects*.

- The first key message that pilot projects teach is the need to optimize the service supply chain, from the generation of electricity to its distribution. It is necessary to analyze how demand and supply should be met, how demand alters consumers' behavior to use less energy, and how to develop more flexible supply.
- To introduce new energy sources, such as renewable energy or electric vehicles, it is necessary to include greater flexibility in the networks.
- Intelligent networks should integrate the intelligence of two-way flows and the facility to accommodate new trends. Demand increases gradually; therefore, it is necessary to build systems of networks that can handle urban growth.

- Cities may develop competitive advantages by introducing high-tech networks and reducing costs and emissions. These networks will make it possible to pinpoint existing defects.
- Pilot projects have helped determine: the ability to administer new technologies in accordance with their evolution, the convergence between public services and asset management, proper management of consumer behavior in light of new technologies, and how businesses must go beyond immediate service.
- Those who develop public policies must also analyze the status of networks, generation and consumer behavior. They must provide the necessary incentives at an early stage to allow the services to manage risks under updated, consistent regulations. Pilot plans will help determine and confirm the proposed objectives.

Chris Curtis, CEO, Schneider Electric North America: *Successful Experiences in Energy Management*.

- Global demand will double by 2030, but at the same time the world faces the paradox of decreasing carbon emissions by 50 percent. It is necessary to understand not only how to properly administer energy but also about its safety, productivity and impact, distancing from the traditional idea of electricity networks for public service by only one mean.
- Although many countries, such as China, have invested heavily in renewable energy, this at best represents only 15 to 20 percent of the solution. Many governments have created incentives aimed at private enterprise, but unfortunately these are not consistent from one year to another, and thus these enterprises' response capacity varies.
- One of the major challenges is the lack of storage capacity for the energy generated. In the short term, there is no more representative opportunity than that of energy efficiency.
- The role of governments is extremely important for the implementation of energy efficiency policies. It is necessary to implement standards and regulations for the establishment of efficiency programs, since it is risky for private enterprises to bet on which standards will prevail in the future.
- We will never have an intelligent network without intelligent buildings; this is a two-way relationship and has unparalleled potential because consumers may become small producers.

Germán Fatecha, ANDE, Paraguay.

- The reason why trends for improvement in the area of energy efficiency are not progressing quickly is mainly the lack of political will to carry out projects related to this issue.
- The limited communication between energy companies and consumers on energy efficiency matters causes problems. Credit conditions imposed by banks hinder projects; thus, greater cooperation is necessary.
- In terms of energy access, it is important to understand the social reality of a country in order to implement policies. For this reason, many governments, and specifically Paraguay, understand energy services as a human right because many populations live in extreme poverty.
- Although Paraguay consumes only 25 percent of the total energy it produces (the rest is exported to Brazil and Argentina), its network system is outdated, which reduces its efficiency.

Ángel Larraga, Mexico Country Manager, Grupo Gas Natural Fenosa.

- The Grupo Gas Natural Fenosa has a presence in over 23 countries, serving 20 million customers. Its most important activities include gas distribution networks, electricity distribution networks, and power generation (16 million megawatts installed). The Group is also working in the area of wind, thermal-solar, hydraulic and biomass energy.

- One of Fenosa's most important functions is the construction of efficient networks that respond to the parameters of service quality, adaptability to growth, and maximum operation.
- The collaboration between the public and private sectors is essential in the development of new efforts in the field of energy efficiency.
- In many countries, the Group has worked with the key objective of operating power plants more efficiently, reducing emissions as much as possible and optimizing consumption.
- The use of vehicular natural gas is also important because of the economic advantages it offers in comparison to traditional fuels. It also has the ecological advantage of reducing CO_2 emissions, not to mention the safety that this gas offers.
- High-yield gas equipment (water heaters and stoves) must also continue to be developed.
- Another course of action proposed by the Group is solar gas, which offers the possibility of maximizing the use of solar energy, since it does not function at all hours.

María del Carmen Fernández Rozado, Counselor, National Energy Commission, Spain: *The Regulators' Perspective*.

- The current development model in developed countries is based on mass consumption of fossil fuels and also on the limited availability of energy resources.
- It is important to highlight the impacts stemming from energy use and transformation: negative effects on the environment that will have a negative effect on future generations. All of this shows a lack of inter-generational responsibility in terms of energy consumption by developed countries.
- One-third of humankind lacks access to modern forms of energy; poor countries have an additional deficit because they cannot consume modern fuels. The current model is not sustainable.
- Regulation is essential for developing a more sustainable model, since it will make it possible to establish a wide range of measures to internalize social and environmental costs, safety and supply in the price of energy, so that they fall on those who provoke them and not on society.
- It is also important that these measures make it possible to provide the consumer with information on energy and on its true value as a natural resource.
- In terms of tools, it is clear there are two essential ones: the development of renewable energies and the improvement of energy efficiency.
- Efficiency is a key element of energy policy, since consuming less energy for the same purpose is essential. This assumes a lower cost in the energy bill, a reduction in greenhouse gas emissions, an improvement in safety in terms of actual provision, and an increase in industrial competitiveness.
- Another important point is the implementation of regulatory instruments, such as the certification of buildings and homes, and efficiency requirements for consumer equipment and vehicles.
- It is necessary to use economic instruments that enable the adoption of new and efficient equipment, fuel changes and consumer habits.
- These range from economic incentives through investment subsidies, fiscal mechanisms, tax reductions, taxes on energy consumption, taxes on CO_2 emissions, and market mechanisms.
- It is also necessary to significantly modify traditional patterns for the production and use of energy.
- The technical, economic and political challenges of safety in energy provision must also be addressed.

Francisco Xavier Salazar, President, Energy Regulatory Commission, Mexico: *Universal Access, Energy Efficiency and Economic Regulation–The Mexican Experience*.

- Regulation is understood in general terms as a State intervention in the market, through certain restrictions issued by agencies that administer this market, to achieve certain social objectives. These social objectives may include resolving market failures or some other type of common interest existing in society.
- Regulation is the most concrete means of carrying out public policies. The purpose of having an economic regulator is that in those sectors where there is a lack of competition, the regulator should establish a series of clear rules that allow the investment to be made and users to have access to it. The regulator lays the foundation for universal access.
- Regulatory instruments include the following: Subsistence tariffs that ensure the provision of energy service to the neediest sectors; these tariffs are also based on cross-subsidies, allowing the user with greater purchasing power to finance the interconnection of poorer users. Subsidized tariffs are a more efficient means of achieving universal access.
- The economic instruments available to the State include budget resources, electrical infrastructure or resources that can be implemented directly by energy service providers. These regulatory or public policy instruments may be used, depending on the circumstances. In Mexico, access to electricity service has basically been conducted by means of budget resources, through electrification programs.
- It is also important that economic regulation is not separated from social regulation. Technical regulation is a key tool of the economic regulator.

THEMATIC SESSION 6: ENERGY EFFICIENCY AND CLIMATE CHANGE PLANNING
September 29, 12:00–13:30 hrs.

Introduction

The session was chaired by Kandeh K. Yumkella, Chair, UN Secretary-General's Advisory Group on Energy and Climate Change and Director-General, United Nations Industrial Development Organization. The panel speakers were:

- Georgina Kessel, Secretary of Energy, Mexico: *The Energy Sector's Perspective Regarding the Climate Change Process.*
- Laura Tuck, Sector Director, Sustainable Development Department, Latin America and the Caribbean Region, World Bank: *Energy Efficiency and Climate Change*.
- Reid Detchon, Vice President for Climate and Energy, UN Foundation: *Toward a Climate Change Agreement*.
- Juan Rafael Elvira, Secretary of the Environment, Mexico: *The Environmental Aspects Toward Climate Change Negotiations*.
- Mario Molina, President, Centro Mario Molina: *Viability of NAMAS*.
- Leandro Alves, Chief, Energy Division, Inter-American Development: *Climate Change and Energy Efficiency*.

Objectives:

- To acknowledge the role of the energy sector in international climate change negotiations.
- To discuss the potential of a regional energy efficiency agenda to contribute to a global climate change agreement.
- To identify countries in the region interested in capacity building and knowledge sharing to support the development of NAMAS based on EE measures.

Summary of key ideas by order of presentation

Laura Tuck, Sector Director, Sustainable Development Department, Latin America and the Caribbean Region, World Bank: *Energy Efficiency and Climate Change*.

- All countries collectively have the power to mitigate climate change through increased energy efficiency measures.
- By replacing 45 million incandescent lightbulbs, Mexico will save 1.6 million tons of carbon emissions per year, equal to what a combined-cycle power plant of 350 MW (running all day) would emit in one year, and it would defer installing some additional 1,100 MW of new peak load capacity.
- Actions such as replacing lightbulbs or changing people's behaviors are cost-effective measures that could have a huge effect on energy savings.
- Energy generation is susceptible to the effects of climate change. Climate change can cause the inconsistency of hydro plants and the patterns of wind for energy, and could damage transmission lines. Smaller generation options are less vulnerable to the effects of climate change.
- Prior to the Copenhagen commitment, there were already global examples of climate finance, such

as the CTF. There are many uncertainties about how the Copenhagen commitment or the fast-start resources will come to pass and the mechanism by which they will be distributed, especially given the fiscal difficulties of the governments in recession.

- It is important to have these funds and to prepare today for when these are available, either by setting up guarantee programs or by participating in NAMAs.

Reid Detchon, Vice-President for Climate and Energy, UN Foundation: *Toward a Climate Change Agreement*.

- It is important to prioritize energy efficiency implementations over reaching a climate change agreement. By effectively implementing energy efficiency operations, there is an opportunity to prove its use, which could lead to successful negotiations, rather than the other way around.
- Although investments in energy efficiency are important, these need to be complemented by effective policies. Funding by itself will not be enough to deal with the barriers to energy efficiency.
- The hope is that organizations and countries that are working on energy efficiency will begin to share experiences and best practices rather than reinventing the wheel. By collaborating, these groups could essentially create a joint action plan for energy efficiency that could inform the negotiations at Cancun and beyond.

Juan Rafael Elvira, Secretary of the Environment, Mexico: *The Environmental Aspects Toward Climate Change Negotiations*.

- Mexico presented a national climate change strategy through the National Development Plan in 2007, which included adaptation, mitigation, financing and technology transfer options. Mexico has proposed 144 initiatives that could potentially reduce between 110 and 130 million tons of emissions.
- There are five ministries in Mexico that are responsible for reaching emissions reductions targets:
    1. Energy
    2. Communications and Transport
    3. Agriculture
    4. Environment
    5. Social Development.
- The reduction of subsidies in Mexico is a major issue and potential barrier to development and environmental performance.
- Mexico also has two programs that are geared toward energy efficiency in small and medium enterprises. Although the result may currently be small, it is a good model for how to reach the private sector.
- If other countries begin to develop their own economic development models that include energy efficiency, then globally nations can begin to put pressure on the climate change negotiations.

Mario Molina, President, Centro Mario Molina: *Viability of NAMAS*.

- Energy efficiency measures should be the first actions taken for low-carbon economic development plans, such as the abatement cost curve plans. Efficiency standards for fuel use in the transport sector would be a start for energy savings in this sector.
- Comprehensive policy regulations will be needed in order to mitigate climate change, not just to reduce subsidies on fossil fuels. There should be climate change planning for urban development.
- There should be policies in place to deter excessive driving, such as heavy ticket fees, and increased

public transportation, such as bus rapid transit systems.

- Countries should create urban development and economic development plans from the standpoint of reducing emissions. What will be needed are plans that take into account mobility, balance of energy services, water, etc.

Leandro Alves, Chief, Energy Division, Inter-American Development Bank: *Climate Change and Energy Efficiency*.

- Data are particularly important because information drives the formation of policies. Countries should participate in the NAMAs so that they will be better equipped to access funding for climate change when it becomes available.
- The Inter-American Development Bank is helping countries in the region to gather such information and develop such plans.
- Smaller countries as well as larger countries will benefit from emissions reductions. Although much of the focus has been on larger emitters, it is important to include the 26 countries of the Bank and the entire Latin America and the Caribbean Region.

LUNCHEON KEYNOTE SPEECH: POLICY RECOMMENDATIONS FOR ADVANCING THE ENERGY EFFICIENCY AGENDA
September 29, 13:30–15:15 hrs.

Introduction

The session was chaired by Francisco Santoyo, CFO, CFE, Mexico. The keynote speech was delivered by:

- Richard Jones, Deputy Executive Director, International Energy Agency.

Objectives:

- To present energy efficiency policies pursued by different countries, international organizations and companies.
- To exchange ideas about programs being implemented to advance the energy efficiency agenda.
- To confer on the role of public–private partnerships and the role of business.
- To discuss the challenges in executing and implementing best practices.

THEMATIC SESSION 7: ENERGY ACCESS–INTERNATIONAL EXPERIENCES AND PROGRAMS
September 29, 15:30–17:30 hrs.

Introduction

The session was chaired by Philippe Benoit, Sector Manager of the Energy Unit, Latin America and Caribbean Region, at the World Bank. The panel speakers were:

- Richard Jones, Deputy Executive Director, International Energy Agency: *Energy Poverty–How to Make Modern Energy Access Universal*.
- Veerle Vandeweerd, Director of the Environment and Energy Group, United Nations Development Programme: *International Experiences*.
- Pedro E. Sánchez Gamarra, Minister of Energy and Mines, Peru: *Lessons Learned from the Peruvian Rural Electrification Program*.
- William Mganga Ngeleja, Minister of Energy and Minerals, Tanzania: *Lighting Africa and Tanzania's Rural Electrification Experience*.
- Milo Pearson, Executive Chairman of the Board of Directors, Caribbean Catastrophe Risk Insurance Fund: *Response to Disasters*.
- Arnaldo Vieira de Carvalho, Senior Energy Specialist, Coordinator, Energy Efficiency and Access Programs, Inter-American Development Bank: *Sustainable Energy for All*.

Objectives:

- To present the status of energy access on the continent and main challenges.
- To learn about best practices.
- To discuss the development of productive economic activities in rural areas through increased access to electricity.
- To confer about the importance of social aspects and indigenous people while developing energy access projects.
- To identify the main technologies to be utilized in energy access programs.
- To talk about the international experience and programs to meet the adaptation and sustainability challenges, including risk-prone disaster areas.

Summary of key ideas by order of presentation

Richard Jones, Deputy Executive Director, International Energy Agency: *Energy Poverty–How to Make Modern Energy Access Universal*.

- The situation today is alarming: 1.4 million people lack access to electricity and 1.7 million lack access to modern cooking devices. Eighty percent of those who lack electricity live in rural areas. This is an issue concerning human well-being and thus it is important to reduce these percentages.
- According to the World Health Organization, 1.45 million people die prematurely each year from indoor air pollution due to inefficient consumption of biomass for cooking and lighting. The Millennium Development Goals to halve poverty by 2015 will not be achieved unless countries double their efforts.
- Achieving universal access to modern services will cost around US$36 billion per year from 2010 to 2030.

- There are three key steps to achieve universal electricity access:
    1. Recognition at the high policy level that the current situation is unacceptable and a change is needed; development of a strategy to achieve this transformation;
    2. Need for a commitment to make the necessary changes; external support will have to play an important role as well as innovative financing mechanisms;
    3. Capacity will be crucial for scaling up modern energy systems; national goals will be necessary.

Veerle Vandeweerd, Director of the Environment and Energy Group, United Nations Development Programme: *International Experiences*.

- The European Union is convinced it is possible to provide energy access to those lacking access to modern services. Some positive ideas to consider in a strategic plan to combat poverty and to achieve sustainable development are: 1) technology to provide access; 2) financing needs (around 3.8 percent of total investment) 3) political will to set objectives; 4) capacity building at the individual, institutional, and government levels; 5) action plans and policies and regulations that support the commercialization of access to energy; 6) targeting the poorest people since the economic benefits will be high.
- An action plan to confront the problems of energy access would need to strengthen the capacity of individuals and institutions, provide funds for capital investments to increase access and communities that operate them on a self-sustaining basis.
- Climate change presents an opportunity. Part of the government financing for promoting sustainable energy could be used also to provide access to modern energy services.

Pedro E. Sánchez Gamarra, Minister of Energy and Mines, Peru: *Lessons Learned from the Peruvian Rural Electrification Program*.

- Everyone agrees on the urgent need to provide electricity to each country's population. In Peru, energy systems are self-sustainable and do not require consumer subsidies, because Peru has a mechanism based on economic growth, which private sector investment is leading.
- In Peru, nearly 25 percent of the population lacks electricity services, mainly due to the wide dispersion of localities. Overcoming these issues will require growth and a high-quality, effective social policy. Peru has a program called "Luz para Todos" (Light for All) that aims to raise the electrification coefficient to 92 percent.
- The main financing mechanism is a cross-subsidy where end-users who consume less than 100 kWh/month have a 20 percent discount, which is financed by those consumers that consume above this amount. As for the connections in the concession zones of the private distribution companies, an incentive mechanism has been established where a connection bond is given to the company as a concessional loan that must be repaid in 10 years, which will be given as a donation if they finance the required connections.
- Increased access is sustained by economic growth and energy efficiency programs, which have allowed Peru to generate the necessary resources for rural electrification programs.

William Mganga Ngeleja, Minister of Energy and Minerals, Tanzania: *Lighting Africa and Tanzania's Rural Electrification Experience*.

- Tanzania has been involved in the promotion of different technologies to increase energy access as well as energy efficiency measures to ensure sustainable development.

- Only 14 percent of the population in Tanzania has access to electricity, and only 2 percent of the population has access in rural areas, where the majority of the population lives.
- Tanzania has established a plan to increase access from 14 percent to 35 percent by 2025. It is trying to develop standardized technical specifications, especially for small grids, and has created a special organization and new laws and regulations to help carry out rural electrification.
- It is also promoting energy efficiency in diverse sectors since the savings from these measures will help Tanzania to reduce energy demand and stimulate economic growth. Energy efficiency standards could contribute to save 25 percent of energy, which would postpone the need to invest 1.5 M in generation.
- Although there is no doubt about the importance of energy efficiency and access in society today, the challenge for developing countries is that these technologies are very expensive in comparison to the purchasing power of people in developing countries.
- The challenge is how to employ these costly technologies so that people can reduce CO_2 emissions.

Milo Pearson, Executive Chairman of the Board of Directors, Caribbean Catastrophe Risk Insurance Fund: *Response to Disasters*.

- Caribbean countries are extremely vulnerable to disasters, which result in high losses, approximately 2 percent of GDP since 1997, and only 3 percent of potential losses are currently insured. The CRIF is attempting to implement a program to transfer risks for its member governments.
- There are initiatives by the Caribbean Services Corporation to find a parametric solution for electricity transmission and distribution, given the potential losses from hurricanes.
- Within the Caribbean, transmission and distribution systems are not generally insured and a study has begun to help establish a program for insuring this type of infrastructure.
- Over its short existence, the CCRF has charged low premiums and the pool has been beneficial, transparent and fair.

Arnaldo Vieira de Carvalho, Senior Energy Specialist, Coordinator, Energy Efficiency and Access Programs, Inter-American Development: *Sustainable Energy for All*.

- Haiti and Nicaragua have the lowest electricity coverage in the region. In terms of the number of people without access, Mexico, Brazil, Haiti and Peru account for more than half of all inhabitants without electricity in Latin America and the Caribbean. There are approximately 40 million people without access to electricity in Latin America and the Caribbean, including Mexico. The most critical barrier is that people are more and more remote and dispersed and this increases the costs of provision, operation and management and the profitability for distribution companies, where ability to pay is also low.
- Lessons learned are that connection to the grid is the best solution, but other options should not be discarded either. The construction and operation of systems should be the responsibility of the distributor, when possible, to ensure sustainability.
- When incentives are needed for companies to enter these markets, the government could fully or partially subsidize the capital cost of the project. The process should also include community participation to make sure it is willing to pay for the connection and tariffs.

- It is also important that the internal home wiring/connection costs are also considered to make sure that households are really energized. Finally, if subsidies are provided for investment, they should be well designed based on the specific parameters of each project to ensure cost-effectiveness.
- The Inter-American Development Bank has a sustainable energy program for all; it provides grant money to help countries develop electrification schemes based on these lessons to increase coverage. Experiences in countries such as Nicaragua illustrate that integration by the World Bank and other donors is needed to achieve increased electricity coverage.

CLOSING SESSION–FINAL REMARKS
September 29, 17:30–18:00 hrs.

Introduction

The session speakers were:

- Laura Tuck, Sector Director, Sustainable Development Department, Latin America and the Caribbean Region, World Bank.
- Leandro Alves, Chief, Energy Division, Inter-American Development Bank.
- Richard Samans, Managing Director, World Economic Forum.
- Georgina Kessel, Secretary of Energy, Mexico.

Summary of key ideas by order of presentation

Laura Tuck, Sector Director, Sustainable Development Department, Latin America and the Caribbean Region, World Bank.

- Six key ideas regarding energy efficiency:
    1. The benefits it presents.
    2. Availability of technologies.
    3. Importance of funding mechanisms, without forgetting the development of appropriate regulatory environments, public policies, and awareness.
    4. Climate change funding, which enables the adoption of energy efficiency and therefore enlarges access to resources.
    5. The energy sector can become more involved in climate change discussions.
    6. The World Bank is prepared to work on the development of financing and capacity building and new instruments.
- Thanks to the Secretary of Energy, her team and everyone involved in the organization of the event. They have done a terrific job.

Leandro Alves, Chief, Energy Division, Inter-American Development Bank.

- The Mexican Government has shown real leadership in the field of energy efficiency.
- This issue is one of the most important pillars in which the Bank should invest.
- The Bank is interested in participating in this unified effort and to contribute through the Energy Innovation Center. Thanks to the organizers for the Forum's successful development.

Richard Samans, Managing Director, World Economic Forum.

- In recent years, the private sector's interest in the topics discussed at the Forum has increased.
- Current business models can be successfully applied for energy efficiency.
- There is a need for developing parallel strategies on climate change: existing negotiations and a new mechanism architecture, which can outline private sector participation.
- The private sector's participation in the International Partnership for Energy Efficiency Cooperation (IPEEC) has already been proposed, because it is necessary.

Georgina Kessel, Secretary of Energy, Mexico.

- The sustainable use of energy must meet higher goals as part of a broader vision on the future of our civilization.
- The dialogue that led to the Forum is a step toward consolidating a regional agenda on energy efficiency, as summarized in the 10 action areas proposed by President Calderón while participating in the morning plenary session.
- It is desirable to have a statement that considers the importance of energy efficiency during the Ministerial Meeting of the Latin American Energy Organization to be held in Nicaragua in late October 2010.
- Closer cooperation and ties are needed in order to promote the expansion of energy efficiency in the region.
- Thanks to the World Bank, the Inter-American Development Bank and the World Economic Forum, as well as the Secretariat of Foreign Affairs, for their hospitality during the event; to all participating countries' delegations, and to members of Mexico's energy sector for their active participation in promoting a common regional agenda.

III. OUTLOOK OF ENERGY EFFICIENCY AND ACCESS POLICIES IN LATIN AMERICA AND THE CARIBBEAN

DISCLAIMER: This section was prepared by the World Bank and the Inter-American Development Bank. Its contents are the sole responsibility of the authors.
Definitions: 1 billion = 1 thousand million; 1 trillion = 1 million million.

ENERGY EFFICIENCY AND ACCESS–GLOBAL EXPERIENCES AND OPPORTUNITIES

Energy efficiency (EE) is one of the most cost-effective and important instruments to help meet the global growth in energy demand. Countries in Latin America and the Caribbean (LAC) will need approximately 40 percent more energy between 2010 and 2020, an increase from 1.2 to 1.7 million GWh.[2] It is estimated that in order to reduce LAC's electricity consumption by 10 percent over the next decade, governments would only need to invest around US$16 billion in the implementation of EE measures (i.e., savings equal to an amount equivalent to meeting the region's energy needs[3]). Otherwise, governments would have to spend around US$53 billion in conventional generating capacity to meet this growth in energy demand (10 percent of LAC's electricity consumption). In addition to these financial benefits, improvements in EE have been shown to contribute to enhanced energy security, increased competitiveness, increased employment generation, higher reliability of energy systems, reduced vulnerability to high and volatile energy prices, and decreased contributions to GHG emissions.

Even though the deployment of EE measures has been shown to be cost-effective in the short and medium terms, the rate of implementation of EE technologies lags well behind the opportunities for energy savings. Among the main barriers that inhibit the scaling up of EE are the absence of effective EE institutions, the lack of adequate regulatory policies, the lack of awareness about EE activities and their benefits, and the difficulties associated with financing large EE projects. The challenge for policy makers and the international community is to help put in place effective policies, implementation mechanisms and financing strategies to ramp up the delivery of energy savings.

Access to electricity is a key component to improving the quality of life of individuals and enabling the economic development of nations. Increasing access to electricity has been shown to contribute to enhanced productivity as well as long-run economic growth, and can have a positive impact across many areas of life, including education, health, gender equality, employment, and household welfare. However, expanding access is challenging, given the large size of the population without electricity: there are an estimated 1.5 billion people worldwide without electricity and approximately 34.1 million people in the LAC region,[4] or 6 percent of the region's population. It is estimated that the cost of providing universal electricity access in urban areas and extending access to 95 percent of the rural population in LAC will cost approximately US$10 billion over the next seven years. From the demand side, affordability is a key issue when seeking to increase access to energy services because both the urban poor and the rural populations are often unable to afford the initial connection costs and are unlikely to be able to cover the recurring operation and maintenance expenses.

There are a number of policies and business models that can be pursued to provide electricity services in an effective and sustainable manner. Moving forward, the challenge for policy makers is to identify and implement policies, innovative vehicles, and financing tools to increase the rate of expansion for sustainable electricity access.

[2] World Bank, Challenges to Meet Long-run Electricity Requirements for Latin America and the Caribbean, 2010.
[3] Source: EE Forum, São Paulo, Brazil, IDB Regional Analysis, September 2008.
[4] IEA, World Energy Outlook, Access Database, 2008.

THE OPPORTUNITY

1. The world's primary energy needs are expected to grow rapidly over the next two decades, with the largest incremental increase derived from developing countries. It will require over US$25 trillion in energy supply infrastructure investments by 2030,[5] or 36 percent of 2008 global GDP,[6] to meet this need. Meeting the growth in energy demand through traditional energy generation models is unsustainable from both an environmental and energy security perspective. Experience shows that EE is one of the most promising and least-cost options for meeting energy demand; its use provides benefits to governments, industries, consumers and the environment.

Government and Industry. EE project economics generally have positive financial returns and are cheaper than installing new supply. Therefore, EE has the potential to ease infrastructure bottlenecks and/or delay capital-intensive investments in new power supply. Other benefits include:

- Contributing to energy security;
- Reducing generation costs by reducing peak load through load management;
- Lowering import dependence, therefore reducing import bills;
- Improving the competitiveness of the economy by reducing overall generation costs, thereby reducing fuel imports (primarily oil and gas); and
- Mitigating the burden on the government budget in sectors with energy subsidies.

Consumers. EE allows lower energy consumption for the same end-use energy services which, in turn, lower energy costs for consumers. This leads to higher affordability, which is particularly important for low-income groups. In addition, EE:

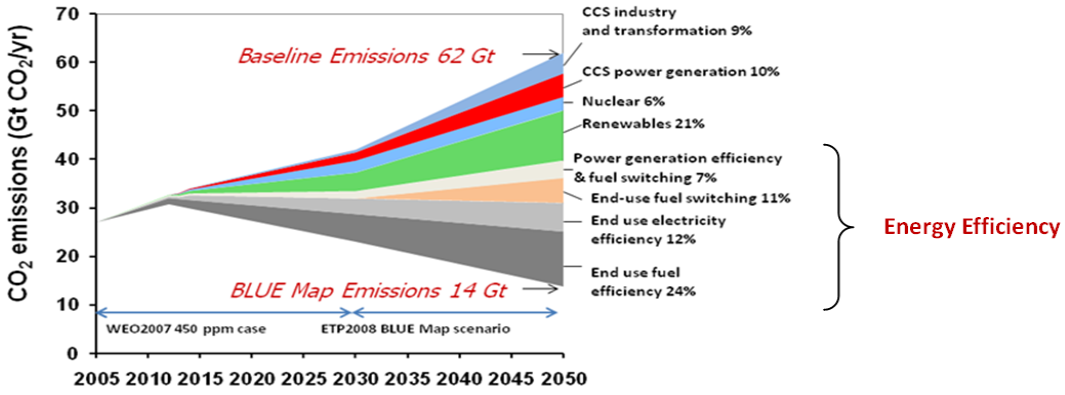
- Reduces energy demand, leading to higher system reliability;
- Lowers outage costs, increasing productivity and income; and
- Generates employment from additional business activities in the manufacturing and service sectors, such as appliance replacement, public lighting, and other EE programs.

The Local and Global Environment. It is estimated[7] that under a baseline scenario, the implementation of key EE policies could result in avoiding as much as 50 percent of the energy-related emissions reduction needed to stabilize CO_2 atmospheric concentrations at 450 parts per million by 2050 (see Figure A).

- Approximately 60 percent of GHG globally comes from energy use across sectors (including transport);
- The reduction in fossil fuel consumption from EE will result in lower local and regional environmental pollution, which in turn reduces human health impacts.

[5] IEA, World Energy Outlook, 2008.
[6] 2008 global GDP (PPP Current International $) was equal to approximately 70 trillion, according to the World Development Indicator Database.
[7] Source: IEA, World Energy Outlook, 2009.

Figure A: GHG Mitigation from Energy Efficiency (Source: IEA, 2009)



2. EE consists of three pillars of action. Together, and even separately, these activities can significantly reduce the growth in energy demand without inhibiting robust GDP growth. Examples of activities under each pillar include:

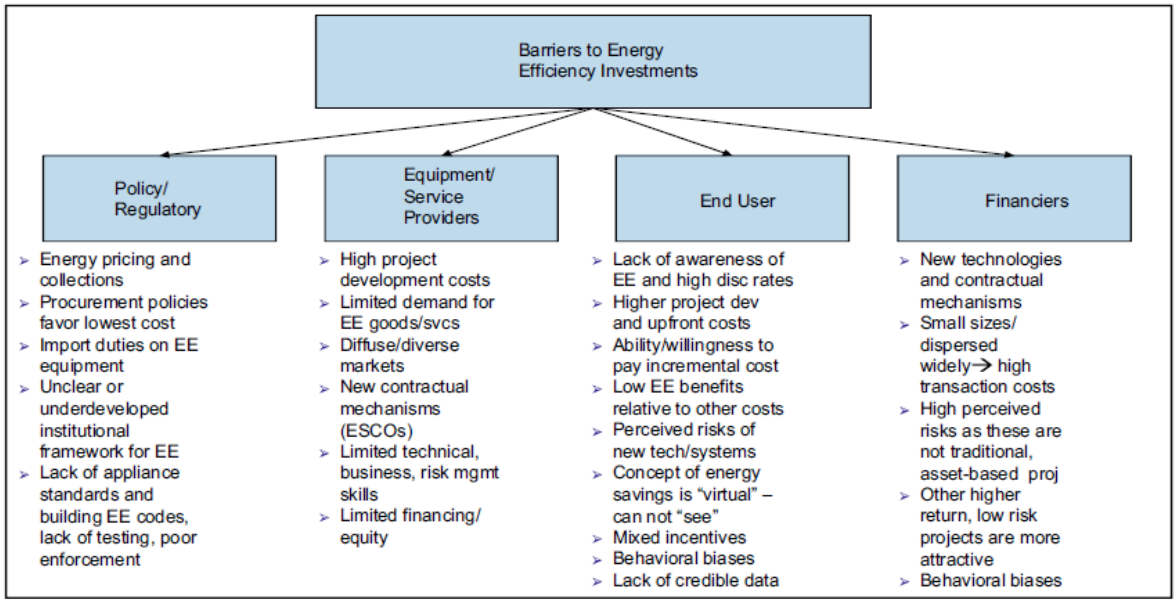
- Demand-side EE: switching to higher-efficiency lighting (CFLs, LEDs); promoting a change to more efficient appliances; installing high-performance electric motors and pumps in industry; enacting more pro-energy efficiency building codes; expanding industrial heat recovery; and adjusting tariff structures to smooth consumption across peak and non-peak periods.

- Supply-side EE: rehabilitating and refurbishing generating plants; expanding the use of co-generation and IGCC; installing efficient and low-loss transformers and high-voltage transmission lines; rehabilitating substations; optimizing power systems and promoting smart grids, district heating/cooling systems; increasing the efficiency of oil and gas extraction processes and equipment; improving refinery efficiency; and reducing gas flaring.

- Energy conservation: turning off lights and equipment when not in use; taking shorter showers; using mass transit rather than individual cars; adjusting thermostats to lower heating and air conditioning consumption.

MARKET BARRIERS TO DEPLOYING EE ACTIVITIES

3. Despite the enormous benefits of energy efficiency, achieving significant and sustained efficiency gains has proved to be challenging in countries throughout the world. Experience shows that to more quickly achieve larger deployments of EE programs, it is necessary to overcome a number of technical, policy and financial barriers and market imperfections, including, but not limited to the following:



Source: Sarkar, Singh, 2010.

4. In addition, EE expansion is hampered by weak institutions and enforcement. The delivery of EE results is driven by the ability of the public agencies to organize, transform and develop new and nascent markets for EE goods and services, and for local private sectors to adopt state-of-the-art EE technologies and practices. Regulatory mechanisms can be the least-cost way to transform markets but require effective local institutions, which can take years to cultivate. Weak institutions can also undermine government policy frameworks and initiatives, including the ability to enforce EE regulations or to coordinate different levels of government, the private sector and civil society in a concerted effort.

OPTIONS FOR PROMOTING EE

5. There are a wide range of approaches, interventions and programs for promoting EE across all major sectors and end-uses that address the demand, supply and conservation dimensions of EE. Many programs were pioneered in OECD countries beginning in the 1970s and have since been replicated and adapted in developing countries. Each EE market transformation practice and model comes with its own strengths and shortcomings, and falls under three broad categories: (1) incentive-based, market-driven approaches; (2) regulatory policy interventions; and (3) informational programs. Examples of programs in each category include:

(1) Incentive-based, market-driven approaches
- Incentive-based Programmatic Deployment of EE Appliances and Equipment
- Incentive-based EE through Utility Demand-side Management (DSM)
- Innovative Financing Mechanisms for EE Implementation
- EE Market Transformation through Energy Service Company (ESCO) Development

(2) Regulatory policy interventions
- Market Transformation through Regulation and Policy Actions
- Supply-side EE Improvements

(3) Informational programs
- Behavioral Change/Education

GLOBAL ACTIONS FOR SCALING UP EE: LESSONS LEARNED AND FUTURE ACTIONS FOR IMPLEMENTATION

6. Experience with EE market transformation efforts in OECD and developing countries indicates that EE implementations require a long-term, dedicated focus, with various actions on multiple fronts.

7. Governments can promote the scaling-up of EE by taking actions on four fronts:

- Develop EE legislation and supporting regulations
- Develop EE programs and set targets
- Build capacity
- Incentivize program replication and scale-up

8. On the global level, collective efforts of various institutions have to be mobilized, and their convening force among member countries needs to be utilized to push the EE agenda further. Key international efforts can include:

- Increasing international cooperation and coordination
- Harmonizing and streamlining international financing procedures
- Transitioning to programmatic and sectoral approaches
- Supporting improved certification of EE equipment
- Supporting voluntary nation pledges for energy savings

9. To accelerate the trajectory of current efforts, EE needs to be understood as a critical tool to enhance energy security, reduce vulnerability to energy prices, increase industrial and commercial competitiveness, and increase employment. With a strong push from the international community, in conjunction with individual actions at local and national levels, it is possible to significantly increase the rate of EE implementations, thereby increasing economic prosperity and security.

ENERGY ACCESS: INTERNATIONAL EXPERIENCE, PROGRAMS AND THE SUSTAINABILITY CHALLENGE

10. Access to electricity is a key component necessary to improve the quality of life of individuals and to enable the economic development of nations as well as to achieve the Millennium Development Goals. Increasing access to electricity has been shown to contribute to enhanced productivity and output as well as long-run economic growth, especially when combined with other infrastructure investments. Electricity can be used for productive purposes such as milling, crop processing, water pumping, battery charging, carpentry, refrigeration, and incubation purposes. Other welfare benefits derived from access to electricity include improved lighting services and the ability to use electronic devices in clinics, schools and shops. Overall, increasing access to electricity can have a positive impact across many areas, including education, health, gender equality, employment and household welfare.

11. The high costs associated with providing electricity are a major barrier to increasing access. It is estimated that the cost of providing universal electricity access in urban areas and extending access to 95 percent of the rural population in LAC will cost US$10 billion over the next seven years, which represents almost 0.25 percent of the 2009 GDP of the region.[8]

12. There are a number of policies/business models that can be pursued to provide electricity services in an effective and sustainable manner. These include, but are not limited to, national electrification planning, the use of grid extension as well as mini-grids or off-grid renewable energy-based technologies in dispersed or isolated areas, rationalization of subsidies for grid-connected and off-grid consumers, and incentive

[8] According to ECLAC, the GDP of LAC Region in 2009 was approximately US$4 trillion.

mechanisms for service provision. Moving forward, the challenge for policy makers is to identify and implement policies, innovative vehicles, and financing tools to increase the rate of electricity access.

13. The objective of this Forum is to facilitate a dialogue among high-level experts in their respective fields to address many of the barriers listed above as well as means to promote EE implementation, primarily in the developing world, through our thematic sessions, as follows:

Session 1. Energy Efficiency Programs, Targets and Action Plans

Session 2. The Role of Standards, Labeling and Codes

Session 3. The Role of Institutions: Projects, Capacity Building and Public Awareness

Session 4. Innovative Financing Mechanisms

Session 5. The Role of Regulators and Utilities in Energy Efficiency and Access

Session 6. Energy Efficiency and Climate Change Planning

Session 7. Energy Access: International Experiences and Programs

Session 1. Energy Efficiency Programs, Targets and Action Plans

Governments can promote EE by setting targets to convert broad policies into concrete actions with lines of accountability.

Pilot projects can be used to test institutional arrangements and market responsiveness. Moreover, incorporating EE into key planning functions (e.g., power sector and urban development plans) can foster the development of EE markets and of public capabilities.

To design effective Action Plan targets and objectives for EE by sector, specific market barriers must be identified. The careful selection of the sectors with the most cost-effective EE potential does not guarantee the cost-effectiveness of an overall program. Other considerations need to be taken into account, such as: (i) the adequacy of the program given the market barriers; (ii) incentives to be provided (subsidizing an EE program might not be necessary); (iii) efficiency of the delivery mechanism (process); (iv) identification of key stakeholders to ensure successful implementation of the proposed activities; and (v) development of adequate financing mechanisms.

In addition to well-defined incentives and financing schemes, an Action Plan must articulate a monitoring and evaluation plan in order to determine whether the activities carried out are meeting the objectives in a cost-effective way or to make changes if required. This includes the definition of adequate EE indicators, the required data, and the data acquisition process.

In order to advance the EE agenda in Latin America and the Caribbean, it is vital for countries to share information on successful policies and programs, and to analyze and discuss best-practice experiences from around the globe.

Session 2. The Role of Standards, Labeling and Codes

Standards[9] and labels[10] (SandLs), and even associated voluntary programs, are some of the most effective policy tools, if designed and implemented properly, to increase the effectiveness of EE measures and to move toward market transformation. SandLs have high potential to influence development and manufacturing, supply distribution and wholesale or retail purchasing, and a more moderate potential to stimulate new technology that either has better performance or lower costs.

Labels can increase the distribution of energy-efficient models by providing the information necessary for consumers to make informed decisions and by incentivizing manufacturers to develop more efficient products. For example, since the use of labels began over 30 years ago, the average use of energy by new refrigerators has dropped by over 75 percent even though new refrigerators have larger capacities and enhanced features.[11] EE standards and labels are not only a tool of industrialized countries, but have become an increasingly popular policy tool and are now used in nearly 60 countries worldwide.

International coordination and knowledge transfers regarding the design, implementation and enforcement of standards and labels will be essential to reduce energy intensity and thereby strengthen economic activity and enhance competitiveness in the Americas.

[9] There are generally three types of EE standards: 1) prescriptive standards, 2) minimum energy performance standards (MEPS), and 3) class average standards. Prescriptive standards specify that a certain feature or device has been installed in all products, whereas performance standards refer to the energy performance, not the technology, of a product. Class-average standards determine the average efficiency of a product.

[10] There are two types of EE labels: 1) endorsement labels, and 2) comparative labels. Endorsement labels are used to signify that a product meets a certain quality criteria, whereas a comparative label rates the efficiency of one product compared to others.

[11] Wiel, S., and McMaHon, J., Energy Efficiency Labels and Standards: A Guidebook for Appliances, Equipment, and Lighting. CLASP, UN Foundation, et al. Washington, DC. Feb 2005.

Session 3. The Role of Institutions: Projects, Capacity Building and Public Awareness

Institutions play a decisive role in enforcing and defining the framework for EE and are critical for the design, implementation and enforcement of EE policies and regulations needed to promote the adoption of new technologies. Depending on the capacity of these institutions, they can be responsible for providing incentives to encourage efficient energy use, setting the regulations needed to reduce the intensity of energy use and providing information to the market to balance supply and demand needs and generate public awareness. These institutions consist of actors such as federal, state or local governments, EE centers and certification institutes, utilities, appliance manufacturers and suppliers, international organizations and NGOs.

It is important to focus capacity building programs on helping institutions to: (i) develop a sound policy and regulatory framework, (ii) train and educate different stakeholders and organizations involved in the sector, (iii) collect data and conduct policy research to improve knowledge, and (iv)strengthen institutional capacity to implement and enforce EE policies and norms.

A variety of countries have undertaken efforts to create EE institutions, laboratories and regional EE centers and to strengthen the capacity of these organizations. It is important for the institutions tasked with enforcing EE norms to have both the capacity and power to do so.

Increasing public knowledge and awareness about the benefits of EE is also a key ingredient to encouraging wide-scale adoption of EE technologies. International experience has shown that a purely technical approach, particularly for labeling programs, is not enough. For standards and labeling programs to be effective and accepted in the marketplace, program implementers must communicate with stakeholders such as industry, retailers, and consumers. An awareness campaign is therefore an essential part of a longer-term strategy to save energy.

Session 4. Innovative Financing Mechanisms

The main barriers to the advancement of EE are the high initial capital cost and the insufficient level of information on EE projects and investments available to banks and other financiers. Innovative financing mechanisms can address these challenges by providing upfront financial resources and information directly to consumers or by working through utilities to influence consumer behavior.

A wide range of public financing mechanisms, including credit lines, revolving funds, special-purpose funds (including equity and mezzanine), partial credit guarantees, loss reserves, and special purpose vehicles, have been used, often in conjunction with multilateral financing through the GEF and carbon markets, to improve the attractiveness of EE investments. However, none of these measures has reached the necessary scale to significantly increase EE investments to date. The private sector has a vital role to play in climate finance as the originator of over 85 percent of global investments, but the low expected returns on climate investments relative to the perceived levels of risk have not incentivized new investments. New instruments are therefore needed to offer appropriate incentives, guarantees and risk–reward balances to appeal to this financial community.

There is no silver bullet to address the EE financing gap. Instead, the clever structuring of various products is necessary to simultaneously enlarge the pool of low-cost financing available and address several of the barriers associated with EE investments. If correctly structured and implemented, these products can help unlock significant amounts of private resources, which, together with public financing, will allow developing nations to grow on a low-carbon path. For example, regulatory, project and other risks can be mitigated by public guarantees backed by multilaterals.

The Clean Technology Fund (CTF)[12] is an example of a financing instrument designed to support low-carbon and climate-resilient development through scaled-up financing channeled through the multilateral and regional development banks.

ESCOs are also designed to address a number of the existing barriers to EE investments while taking on project performance, and sometimes also credit risks. However, international experience has also indicated that long-term government support and strong legal and financial policies are necessary in order to increase the acceptance of the ESCO model and to enforce it, Capacity building might also be needed to aid the development of new ESCOs.

[12] The Clean Technology Fund (CTF) is one of the Climate Investment Funds (CIFs) created to provide scaled-up resources to invest in projects and programs that contribute to the demonstration, deployment and transfer of low-carbon technologies with a significant potential for long-term greenhouse gas reductions. The CIFs, approved by the World Bank's Board of Directors on July 1, 2008, are a collaborative effort among the Multilateral Development Banks and countries to bridge the financing and learning gap between now and a post-2012 global climate change agreement.

Session 5. The Role of Regulators and Utilities in Energy Efficiency and Access

Utilities and regulators will be at the heart of the transition to greater energy efficiency given the key role played by electricity and gas utilities. The IEA estimates that around US$13 trillion of investment is needed to upgrade electrical infrastructure worldwide by 2030. These investments present both a challenge and an opportunity to modernize electricity systems and to apply state-of-the-art technology with the intention of increasing efficiency and broadening access to energy. A range of supply- and demand-side efficiency solutions are called for, as well as programmatic deployment efforts.

The IEA estimates that between 21 and 29 Exajoules (EJ) per year can be saved worldwide by improving the efficiency of coal, natural gas and oil-fired power plants. Over half of this potential is in developing countries, which on average have lower power plant efficiencies. The use of combined-cycle natural gas turbines (CCGT),[13] co-generation or combined heat and power systems (CHP), which use excess heat from power plants for industrial or district heating needs or excess heat from industry for power generation, present significant EE improvement potential. On the transmission and distribution side, both technical and nontechnical losses can be reduced through more efficient transmission lines, reducing electricity theft and increasing electricity metering.

Although incentive-based EE through Utility Demand-Side Management (DSM) was conceived in North America, and California has had one of the most successful programs,[14] many developing countries (e.g., Argentina, Brazil, India, Mexico, Pakistan, Philippines, South Africa, Sri Lanka, Thailand, Uruguay, Vietnam) have implemented DSM programs in local electric utilities. Regulators traditionally mandate utilities to undertake DSM, with EE costs recovered through utility bills.

The penetration of residential EE end-use appliances, such as refrigerators and lightbulbs, has often relied on large-scale incentive-based programmatic interventions by governments, primarily implemented through utilities. Dozens of countries (e.g., Bangladesh, Bolivia, China, Cuba, Ethiopia, India, Mexico, Philippines, Rwanda, South Africa, Sri Lanka, Thailand, Uganda, Vietnam) have promoted efficient lightbulbs, mostly CFLs, through bulk procurement and distribution. Bulk purchases, utility financing and negotiated bulk discounts have been successful at bringing down incremental costs. Other programs have focused on chillers (Thailand, India, Philippines), motors (China), refrigerators (Brazil, EU, US, Mexico) and air conditioners (Thailand). All of the successful programs were based on strong upfront market research and had effective public campaigns.

Momentum is increasing globally for the smart grid concept; major players from the utility, IT and telecom industries are developing investment plans while stimulus funding is increasingly becoming available to pilot projects. Smart grids could enable a systematic integration of a range of efficiency solutions, but may also prompt a rethinking of the role of utilities in energy delivery. Regulations will be essential to encourage utilities to implement rural electrification and EE programs, to define the necessary standards and specifications required to ensure the provision of quality EE equipment and to guide the development of the industry.

[13] CCGT allows power plants to reach efficiencies of 60 percent.

[14] California has been one of the most successful US states at implementing DSM programs. Its program led to annual savings of US$772 million and 1,300 GWh between 1990 and 1992, which represented approximately 11 percent of total production.

Session 6. Energy Efficiency and Climate Change Planning

The 15th Conference of the Parties to the United Nations Framework Convention for Climate Change (UNFCCC), COP15, which took place in December 2009, resulted in the Copenhagen Accord, an agreement that was negotiated by approximately 30 heads of states and governments whose countries are collectively responsible for more than 80 percent of global GHG emissions. The Copenhagen Accord has pledged to channel US$100 billion per annum by 2020 to decrease global emissions. However, the reality of a post-recession developed world is more debt and less overall spending, so it is unlikely that government resources alone will suffice to tackle the climate financing challenge, particularly in developing countries.

As the originator of over 85 percent of global investments, the private sector has a vital role to play in climate finance, but given the unprecedented level of scale-up required, the private sector will need to access funds that go well beyond traditional public and private resources. There will be a need to reach out to institutional investors whose engagement is currently limited and who are not enticed by the expected returns on climate investments, relative to the perceived levels of risk. One means for countries to decrease the perceived risk to the private sector and to tap into Copenhagen Accord public funding is through the Nationally Appropriate Mitigation Actions (NAMAs).

NAMAs are voluntary emissions reduction measures undertaken by developing countries and are reported by national governments to the UNFCCC. They are expected to be the main vehicle for mitigation action in developing countries under a future climate agreement, and can be policies, programs or projects implemented at national, regional, or local levels. NAMAs are a relatively new concept, and consequently opportunities for developing countries to develop NAMAs to support low-carbon development and mobility have not yet been realized.

Globally, it is estimated[15] that under a baseline scenario, the implementation of key EE policies could result in avoiding as much as 50 percent of the energy-related emissions reduction needed to stabilize CO_2 atmospheric concentrations at 450 parts per million by 2050. Furthermore, EE can be one of the least-cost ways to mitigate greenhouse gas emissions, even potentially offering negative costs.

[15] Source: IEA, World Energy Outlook, 2009.

Session 7. Energy Access: International Experiences and Programs

Access to electricity is a key condition necessary to improve the quality of life of individuals and to enable economic development of nations, as well as to achieve the Millennium Development Goals. It can have a positive impact across many areas, including education, health, gender equality, employment, and household welfare. Increasing access to electricity has also been shown to contribute to enhanced productivity and output as well as long-run economic growth, especially when combined with other infrastructure investments.

According to the UN Secretary-General's Advisory Group on Energy and Climate Change, more than 1.5 billion people have no access to electricity and a billion more lack reliable power supply. The UN has called all its members to ensure universal access to modern energy services by 2030. The high costs associated with providing electricity are a major barrier to increasing access. It is estimated that the cost of providing universal electricity access in urban areas and extending access to 95 percent of the rural population in LAC will cost US$10 billion over the next seven years, which represents almost 0.25 percent of the region's 2009 GDP.[16]

The individual cost can average around US$1,200 per connection, but could also be much higher in remote areas. Affordability is an issue because both the urban poor and the rural population are often unable to afford the initial connection costs. Furthermore, the cost of service provision generally increases as coverage increases because the next unserved household is typically further away from the existing grid. In rural areas, the ability to pay monthly electricity bills is also low because income is generally seasonal, mainly coming from agriculture sources. Consequently, the consumption of electricity in rural areas is low and primarily used for lighting. High costs combined with low or dispersed demand makes distribution companies unwilling to serve remote areas.

In terms of sustainable access planning, there is a rising need to plan, not only for "last-mile" access, but also for repairing and maintaining affected power lines. Due to the negative effects of climate change, many countries are increasingly susceptible to larger and more frequent weather-related disasters that hamper electricity access efforts. Funding for infrastructure recovery and adaptation efforts are often limited in comparison to the many competing needs during disaster recovery situations. The Caribbean Catastrophe Risk Insurance Fund (CCRIF),[17] the first and only multi-nation catastrophe risk fund, is an example of a tool that could be used to meet future climate adaptation needs, but more such vehicles need to be created with infrastructure specific allocations.

There are a number of policies/business models that can be pursued to provide electricity services in an effective and sustainable manner. These include, but are not limited to, national electrification planning, the use of grid extension as well as mini-grids or off-grid renewable energy-based technologies in dispersed or isolated areas, rationalization of subsidies for grid-connected and off-grid consumers, and incentive mechanisms for service provision. Moving forward, the challenge for policy makers is to identify and implement policies, innovative vehicles, and financing tools to increase the rate of electricity access. Generalized access to this essential service can also be achieved through cooperation between the public and private sectors.

[16] According to ECLAC, the GDP of the LAC Region in 2009 was approximately US$4 trillion.

[17] CCRIF is the world's first multi-country risk pool, and is also the first insurance instrument to successfully develop a parametric policy backed by both traditional and capital markets. It is a regional insurance fund for Caribbean governments designed to limit the financial impact of catastrophic hurricanes and earthquakes to Caribbean governments by quickly providing financial liquidity when a policy is triggered (www.ccrif.org/).

ANNEXES

IV. EXECUTIVE NOTES ON ENERGY EFFICIENCY AND ACCESS POLICIES BY COUNTRY

DISCLAIMER: This section was prepared by the Latin American Energy Organization (OLADE) and the Organization of American States (OAS), with the support of the World Bank and the Inter-American Development Bank, and is based on reports completed by the Economic Commission for Latin America and the Caribbean (ECLAC).[18] Its contents are the sole responsibility of the authors.

LESSONS LEARNED IN LATIN AMERICA AND THE CARIBBEAN

Energy Efficiency Programs and Actions

The analysis conducted in Latin America and the Caribbean shows significant progress. In recent years nearly all of the region's countries have undertaken energy efficiency programs: national programs, projects and initiatives that are evidently very different, in response to factors such as the size and design of each country's economic structure, population distribution, access to technology and information, regional and global integration, access to (or lack of) financing, development of regulatory instruments, climate, cultural and social aspects.

For many of the same reasons listed above, regulatory and institutional contexts are also very different for various countries within the region, and due to the need for adaptation to each situation they cannot be standardized; this does not mean that one should ignore successful cases and not evaluate possible adaptations to each context. Nor do these variations mean that uniform bases cannot be established to facilitate the development of energy efficiency, a space where multilateral institutions could significantly contribute.

In most of the countries, the efforts to develop energy efficiency are individual/specific, with little continuity, and in extreme cases have led to expensive consequences. For example, in an extreme case, due to the lack of monitoring programs, there was a need to re-issue mass compact fluorescent lamp exchange campaigns because at the end of the lamps' life most customers reverted to using cheaper incandescent bulbs. In other words, State energy efficiency policies have generally not been constituted as they should be. The mere existence of laws, decrees or regulations that make energy efficiency efforts mandatory does not ensure the success of a nationwide program.

The lack of continuity in energy efficiency policy creates the risk of fragmenting the use of high-capacity technical equipment. Training national experts in energy efficiency programs takes many years of ongoing work. One of the reasons is that there is still an excessive dependence on international cooperation to promote energy efficiency programs, even though energy price signals have begun to reflect the shortage of and increasingly greater needs for investment to increase energy supply; more consistent national incentives should be promoted with regard to the rational use of and efficient decrease in consumption.

In most of the countries analyzed, there are no (or very few) national sources of specific financing for energy efficiency programs, and thus the sustainability of national programs has not been achieved.

The quality and reliability of available information in most of the countries are far from satisfactory and thus are not a sufficient basis for monitoring the results of energy efficiency programs. The absence of key indicators of the success (or failure) of a national energy efficiency program is a significant deficiency in this

[18] CEPAL LC/W.280: Energy Efficiency in Latin American and the Caribbean; Situation and Outlook, 2010.

regard. Based on these observations, more in-depth studies are beginning to be conducted, aimed at the design of results indicators for energy efficiency programs.

Lessons Learned

Experience in the development of energy efficiency programs and efforts makes it possible to establish the following set of "lessons learned." These do not refer to any country in particular, but their concepts are basically applicable, in general terms, to numerous countries in the region.

- Energy efficiency is still not supported by a State policy in many countries of the region, although the potential energy savings remain high. In general, 20–25 percent of energy consumption can be avoided through the use of rapid repayment measures.

- For the achievement of concrete results in matters of the rational, efficient use of energy, there must be institutions that design, implement and operate national programs in a stable and ongoing manner.

- Institutional architecture is key to the success (or failure) of an energy efficiency program, since the hierarchy in terms of who leads the energy efficiency program(s) and his or her degree of influence on the rest of the government administration has a major influence on results. Ideally, those institutions that are already in operation should be strengthened, rather than creating new ones, and their management skills should be improved (capacity building).

- The institutional structure should actively promote the incorporation of decentralized institutional capacities for the development of energy efficiency programs (regions, states or provinces, municipalities).

- Institutional development must be able to quantify opportunity, without spending more on efforts to quantify them than to actually use them, and results monitoring should be undertaken from the start of program implementation.

- At the same time, it is necessary to forcefully continue working on energy efficiency from the supply side (generation, transportation and distribution of electrical energy; petroleum refining and natural gas processing; biofuel generation, etc.).

- In the same context, regulatory frameworks to incentivize the promotion of energy efficiency should be designed (if there are none) and strengthened (if they exist). For example, many countries have not taken advantage of the interesting potential that exists for energy co-generation for industries and large-scale facilities of the tertiary sector because regulation is not favorable. To achieve this, it is necessary to promote the involvement of electricity and fuel providers in the design and operation of energy efficiency programs.

- Energy policy signals have generally been insufficient for encouraging energy-saving behavior and actions among users. It is necessary to increase the public information effort by establishing a dissemination policy aimed at smoothing out the information imbalances existing in the market with regard to energy use. The user must know what to do, where to obtain advice, what and where to buy, how to buy (financing), who can help him with projects (ESCOs,[19] consultants), etc.

[19] In this work, ESCO is understood as a private firm or company that provides energy assessment services, whose task for a given project includes: technical-economic assessment of the project, determination of energy-saving measures

- The State policy must include the implementation of efficiency regulations and standards, and information must be provided to consumers.

- National energy efficiency programs require the establishment of financial mechanisms designed specifically to respond to and coordinate the enormous number of investment decisions involved in these programs, improving the linkage of private financing with opportunities for energy saving.

- It is necessary to increase the number of national/regional technical staff dealing with energy efficiency, and to actively and simultaneously support market development for energy service companies (*empresas de servicios energéticos*, ESCOs) that make the best use of trained staff.

Access to Energy Services

Based on an analysis of programs implemented in recent years to improve access to energy for peri-urban and/or rural areas, a list of "lessons learned" can be prepared. These lessons, if appropriately internalized, will greatly contribute to optimizing the process of improving access to energy.

Social benefits and improved quality of life, rather than the generation of income and economic benefits, have been the drivers of rural electrification processes.

The use of renewable energy for productive uses is still at an early stage and merits greater attention. Although development agencies, donor organizations and governments recognize the importance of this issue, the proper tools that allow quick implementation have not yet been found.

The economic benefit of energy use from renewable sources is more likely in areas where there have been prior efforts aimed at economic development, and the energy dimension can be incorporated in activities such as the provision of water, health and education services, agriculture, etc.

The number of studies that relate the generation of income and economic benefits to rural electrification through renewable energy is very limited.

In addition, it can be observed that:

- Access to electricity services in decentralized rural sectors has historically been supported by means of subsidies, aid programs and price reductions for small systems in order to reduce the initial investment.

- New strategies have been developed to facilitate access to rural electrification. These include credits for direct purchasing, microcredits, equipment leasing and rental, but these ideas either have not been fully tested or have had limited success in terms of their implementation.

- Credit risk is a problem that is perceived as serious by financial entities and by equipment vendors, making sales through credits very difficult. The scattered rural population generally lacks stable income that is conventionally verifiable. As a result, credits are very expensive or nonexistent. Even with credits or leasing, the poorest sectors still need subsidies in order have access to electricity.

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with an indication of the investment needed and its repayment period, implementation of recommended measures, provision of the necessary engineering and financing, and charges for its services through a performance contract. If it does not comply with this complete cycle, it will not be considered an ESCO but rather a consulting firm.

Other highlights with reference to access to energy:

- Effective communication with local community representatives is essential (language, involvement of local authorities, and access to media).

- Making use of the community's organizational culture (community enterprises, community leaders) assists the project.

- To select a project beneficiary community with strong self-management components, a prior socioeconomic diagnostic should be conducted to detect strengths, weaknesses, opportunities and threats that may affect the project.

- The role of women is highly relevant in projects, especially for the execution of productive activities. In general, they initiate the projects.

- The adjustment of regulatory frameworks to the rural and/or peri-urban context is crucial.

- The training of users is essential to ensure the operation and sustainability of projects.

- Lighting is not a productive project and people did not request a subsidy for it; they did request it for productive projects.

- The community should "take ownership" of the project and equipment.

- When a project is highly subjected to deadlines, it is very risky to depend on the pace of work by beneficiaries who are highly vulnerable because they sometimes live in survival conditions.

- In peri-urban areas, a significant number of low-income households lack access to electricity services. As in the case of families in rural communities, projects that support the interconnection process through subsidies should be executed.

- Densification projects in peri-urban areas require different, more detailed treatment than those in rural areas.

- The countries' large electricity companies are an important means of reaching low-income households. However, a considerable number of small cooperatives are operating and constitute an efficient alternative for reaching distant, needy populations.

- The companies and/or cooperatives are able to identify beneficiaries who need subsidies. However, public institutions and civil society organizations can more directly recognize the demand.

- When projects with the co-participation of local governments are developed, it is essential to generate interest among the leading executive authorities with regard to project execution, since this is a determining factor for project conclusion.

- Once electricity is introduced in a household, it is very unlikely that its members will go back to using burners and/or candles, for example; this is an important aspect for project sustainability.

ANTIGUA AND BARBUDA

1. Existing Regulations

Currently, there is no national energy policy that regulates or serves as a framework for energy issues in general. For the time being, the country only has an electricity law that also deals with drinking water and telephone services.

At present, the Government is actively working to establish a national energy policy, supported by the Sustainable Development Department of the Organization of American States (OAS) through the Caribbean Sustainable Energy Program (CSEP).

Energy is currently the responsibility of the Office of the Prime Minister.

2. Institution responsible for energy efficiency

Currently, there is no institution responsible for energy efficiency (EE). For now, with the aid of the Sustainable Development Department of the OAS, through the CSEP, an Energy Office has been created and is under the responsibility of the Prime Minister. This is the step prior to the establishment of a government unit or institution responsible for this issue.

3. Organization and definition of national programs: programs under execution

CSEP: Caribbean Sustainable Energy Program

The program is implemented by the Energy and Climate Change Section of the Sustainable Development Department of the OAS. This program seeks to increase the sustainability of the energy sector in the Caribbean by improving governance and management.

The program's main objective is to accelerate the transition toward cleaner types of energy and their more sustainable use. Its specific objective is to take into consideration market conditions for the development and use of renewable energy and energy efficiency systems through the mitigation of current barriers to their introduction.

More details at: http://www.sepa-americas.net/proyectos_detalle.php?ID=6.

LCCA: Low-Carbon Communities of the Americas

Project supported by the United States Department of Energy and the Organization of American States. This project will make it possible to expand the development and use of renewable energy and energy efficiency systems, helping to increase the sustainability of energy supply and reduce carbon emissions.

The project's objective is local training through technical programs on how to conduct an energy efficiency audit and evaluate the modernization that is needed. It will also place emphasis on strengthening communities' capacities; in particular, local renewable resources will be evaluated and studied.

Efficient Lightbulb Program: a program developed and implemented by Cuba

In 2006, the Government of Antigua and Barbuda and the Government of Cuba agreed on an energy efficiency project under which Cuba provided 215,000 efficient lightbulbs. These bulbs were used to exchange the same number of incandescent bulbs in Antigua and Barbuda. The project's objective was to

demonstrate the usefulness of direct measures that fully benefited the island's population, with consequent energy savings.

CWP: Caribbean Wind Power Project

A program aided by GTZ and aimed at determining the wind power potential of the island. The ultimate objective is to promote the use of wind power by estimating the potential of this resource on the island and determining the most favorable points for generating electricity through the use of wind turbines.

CREDP: Caribbean Renewable Energy Development Programme

This program is financed by UNDP and GEF, technically supported by OAS and implemented by CARICOM. The program seeks the promotion and adoption of renewable energy technologies by removing and overcoming commercial barriers in order to reduce the costs of these emerging technologies.

The project's objective is to eliminate obstacles to the use of renewable energy in the Caribbean. Through concrete efforts to overcome policy, financing, and capacity barriers and obstacles to raising awareness, it is estimated that the contribution of renewable energy to the region's energy balance will be significant.

4. Schemes or mechanisms to finance energy efficiency efforts

Currently, there are no official mechanisms for the financing of energy efficiency efforts in Antigua and Barbuda. It is expected that, through the implementation of a national energy policy, the country will be able to develop clear, transparent mechanisms to support these types of efforts.

5. Access to energy

In Antigua and Barbuda, nearly 100 percent of the population has access to electricity. In this regard, access to energy is not a problem on the island. Unfortunately, the use of fossil fuels makes energy in general very expensive because the island is 100 percent dependent on petroleum, whose price variations and constant price increases make it unsustainable to generate energy in the medium term, due to the high prices that this type of fuel can have.

ARGENTINA

1. Existing regulation

Decree 140/07 by the National Executive Authority (December 21, 2007). Launched the National Program for the Rational and Efficient Use of Energy *(Programa Nacional de Uso Racional y Eficiente de la Energía, PRONUREE).* Ref.: http://energia.mecon.gov.ar

2. Institution responsible for energy efficiency

In order of institutional agency: National Government, Ministry of Federal Planning, Public Investment and Services, Secretariat of Energy, Under-Secretariat of Electricity, Bureau of Promotion, Energy Efficiency (EE) Coordination Office. It has been operating with the latter name (EE Coordination Office) since 2002).

Other relevant agencies: Department of Energy of the National Institute for Industrial Technology *(Instituto Nacional de Tecnología Industrial, INTI)* (www.inti.gob.ar); Argentine Institute of Standardization *(Instituto Argentino de Normalización, IRAM)* (www.iram.org.ar); Energy Groups of the National Technological University *(Universidad Tecnológica Nacional, UTN)*. Ref.: http://www.frsf.utn.edu.ar

3. Organization and definition of national programs: programs under execution

Energy efficiency programs under execution (Secretariat of Energy): PRONUREE and GEF/WB Energy Efficiency Program (PROENER): the latter program began in April 2010.
Ref.: http://energia.mecon.gov.ar and associated links.

At regional level, the Inter-American Development Bank (IDB) is providing technical assistance to the provinces of Salta and Buenos Aires in the design and implementation of energy efficiency, renewable energy and biofuel programs.

4. Schemes or mechanisms for the financing of energy efficiency efforts

Secretariat of Energy: national budget contribution. For the development of the GEF/World Bank Energy Efficiency Program (six years), financial assistance is provided by the Global Environment Facility (US$15,155,000) through the World Bank.

5. Fiscal, economic or tariff incentives

The free distribution of compact fluorescent lamps (CFLs) imported from Cuba and Venezuela through electricity distribution companies could be considered an incentive (promotion of efficient elements).

6. Market for efficient equipment

The following exist in Argentina's market for efficient elements and equipment: CFLs, refrigerators and freezers, air conditioners, three-phase electrical induction motors.

7. Equipment labeling

Labeling is mandatory to provide information on the efficiency of the following classes of electricity-consuming equipment: refrigerators and freezers, CFLs, incandescent lamps[20] and air conditioners. Labels

[20] Although its commercialization will be prohibited from 1/1/2011 onwards.

were issued voluntarily for the time being, for household washing machines, three-phase induction motors, ballasts, cooking devices (portable stoves, ovens) and new buildings (heating).

8. Access to energy

Argentina has a high degree of electricity coverage. According to the 2001 national census (the latest conducted to date), service is provided to 96 percent of occupied homes; the remaining 4 percent lack electricity. Of the 400,000 urban and rural homes that lacked access to the electricity grid, 80 percent are homes scattered throughout the rural area; this represents 30 percent of the rural population.

Argentina, as well as Chile, Costa Rica, Uruguay and Mexico, have the highest levels of access to electricity in the Region.

To address the rural population's lack of electricity access, the Secretariat of Energy is conducting the Project for Renewable Energy in Rural Markets *(Proyecto de Energías Renovables en Mercados Rurales PERMER)*, financed by a World Bank loan (US$30 million), a Global Environment Facility grant (US$10 million), Electricity Funds or other provincial funds, contributions by provincial concessionaires and by beneficiaries.

The project is currently being executed in the provinces of Jujuy, Salta ,Tucumán, Santiago del Estero, Chaco, Chubut, Catamarca, Misiones, Río Negro, Neuquén and San Juan.

(More information at http://energia.mecon.gov.ar/permer/permer.html)

BAHAMAS

1. Existing regulation

Currently, there is no national energy policy that regulates or serves as a framework for energy issues in general.

At present, the Government is working actively to establish a national energy policy, supported by the Inter-American Development Bank (IDB) and the Sustainable Development Department of the Organization of American States (OAS) through the Caribbean Sustainable Energy Program (CSEP).

Energy is currently the responsibility of the Ministry of Energy and Environment.

2. Institution responsible for EE

Currently, there is no institution responsible for energy efficiency (EE). For the time being, with the aid of the Sustainable Development Department of the OAS, through the CSEP, an Energy Office has been created under the responsibility of the Prime Minister. This is the step prior to the establishment of a government unit or institution responsible for this issue.

3. Organization and definition of national programs: programs under execution

CSEP: Caribbean Sustainable Energy Program

The program is implemented by the energy and climate change section of the Sustainable Development Department of the OAS. This program seeks to increase the sustainability of the energy sector in the Caribbean by improving governance and management.

The program's main objective is to accelerate the transition toward cleaner types of energy and their more sustainable use. Its specific objective is to take into consideration market conditions for the development and use of renewable energy and energy efficiency systems through the mitigation of current barriers to their introduction.

More details at: http://www.sepa-americas.net/proyectos_detalle.php?ID=6

IDB: Implementation of Sustainable Energy Projects in the Bahamas

The project's aim is to provide technical assistance on EE matters in public buildings and in the residential and commercial sectors, and to implement demonstration projects, particularly the replacement of incandescent bulbs with CFLs and the installation of solar collectors in residential houses. It also aims to explore alternatives for Renewable Energy (RE) and to implement RE pilot projects, particularly a demonstration project using solar panels.

It also seeks to strengthen the energy sector and to support the Government through the revision of its energy legislation, regulations and policies to promote sustainable energy and institutional strengthening in the areas of RE and EE.

IDB–GEF Collaboration: GEF funds will be used to finance solar collector and solar panel pilot projects under the IDB initiative.

LCCA: Low-Carbon Communities of the Americas

Project supported by the United States Department of Energy (DOE) and the OAS. This project will make it possible to expand the development and use of renewable energy and energy efficiency systems, helping to increase the sustainability of energy supply and reduce carbon emissions.

The project's objective is local training through technical programs on how to conduct an energy efficiency audit and evaluate the modernization that is needed. It will also place emphasis on strengthening communities' capacities. In particular, local renewable resources will be evaluated and studied.

CREDP: Caribbean Renewable Energy Development Programme

Program financed by UNDP and GEF, technically supported by OAS and implemented by CARICOM. The program seeks the promotion and adoption of renewable energy technologies by removing and overcoming commercial barriers in order to reduce the costs of these emerging technologies.

The project's objective is to eliminate obstacles to the use of renewable energy in the Caribbean. Through concrete efforts to overcome policy, financing and capacity challenges and barriers to raising awareness, it is estimated that the contribution of renewable energy to the region's energy balance will be significant.

4. Schemes or mechanisms to finance EE efforts

Currently, there are no official mechanisms for financing EE efforts. It is expected that, through the implementation of a national energy policy, the country will be able to develop clear, transparent mechanisms to support this type of efforts.

5. Access to energy

In the Bahamas, nearly 99 percent of the population has access to electricity.

Unfortunately, the use of fossil fuels makes energy in general very expensive because the island is 100 percent dependent on petroleum, whose price variations and constant price increases make it unsustainable to generate energy in the medium term, due to the high prices that this type of fuel can have.

BARBADOS

1. Institution responsible for energy efficiency

Barbados has no laws, decrees or regulations specifically aimed at promoting energy efficiency. In the area of energy, there is an Energy Efficiency Committee in the Ministry of Investments, Finance and Energy.

2. Organization and definition of national programs: programs under execution

A Sustainable Energy Program was launched in March 2009 with the objective of promoting and supporting energy efficiency efforts to limit the country's dependence on fossil fuels. The program's development is assisted by the Inter-American Development Bank (IDB) and includes energy efficiency activities in Caribbean hotels. The program is aimed at institutional strengthening in the areas of energy efficiency, bio-energy, carbon bonds and dissemination of successful projects. It is a joint GEF–IDB operation to support energy efficiency and renewable energy pilot projects, totaling US$1 million. The pilot projects are based on the results of studies conducted in these two areas through the IDB technical cooperation program "Sustainable Energy Framework for Barbados" (BA-T1007).

3. Schemes or mechanisms to finance energy efficiency efforts

The budget resources allocated by the Government of Barbados for the promotion of energy efficiency are scarce. IDB is contributing funds for the program cited in paragraph 2 above and for the hotel efficiency project. The Caribbean Tourism Organization is monitoring this project.

The document "Development Strategy 2010–2014" of the Government of Barbados mentions the intention to create a "Smart Energy Fund" to aid the implementation of energy efficiency projects.

4. Fiscal, economic or tariff incentives

The Government grants companies and businesses a tax exemption corresponding to 150 percent of the investment made in projects dealing with energy efficiency. It allows individuals to request a tax exemption for money spent on energy diagnostics to evaluate ways to improve energy use in their homes or businesses, as well as for money spent on energy improvements (retrofitting) in their homes or businesses.

5. Market for efficient equipment

There is no developed market for highly energy-efficient equipment. The "Development Strategy 2010–2014" of the Government of Barbados mentions the intention to develop schemes that encourage the implementation of energy-efficient equipment. The labeling of energy-consuming equipment has not been implemented.

6. Access to energy

According to the Inter-American Development Bank, electricity coverage in Barbados is over 90 percent (as of 2007). The Bank has approved over US$2 million in technical assistance to promote the Sustainable Energy Framework for Barbados (SEFB), which is a key element in the Government's strategy to reduce dependence on fossil fuels. IDB, through GEF financing, will also provide US$1 million in grants aimed at pilot projects in the areas of energy efficiency, promotion of compact fluorescent lamps (CFLs) and energy meters, as well as photovoltaic systems and the generation of wind-based micro-energy.

BELIZE

1. Existing regulations

Currently, there is no national energy policy that regulates or serves as a framework for energy issues in general. At this time, there is only an electricity law. A project aimed at developing a national energy policy, supported by the Sustainable Development Department of the Organization of American States (OAS), is currently in the development phase.

The Ministry of Communications, Transportation and Public Services and its Public Utilities Commission (PUC) are responsible for the electricity sector. In addition, the Ministries of Natural Resources, Environment, Commerce and Industry are involved in the topic of Renewable Energy.

2. Institution responsible for EE

At present, no institution is officially responsible for EE. Electricity is the responsibility of the Public Utilities Commission.

3. Organization and definition of national programs: programs under execution[21]

OAS: A National Energy Policy for Belize

This project aims to provide technical assistance and support from relevant stakeholders in the region, and seeks to develop a sustainable national energy policy.

CREDP: Caribbean Renewable Energy Development Programme

Program financed by UNDP and GEF, technically supported by OAS and implemented by CARICOM. The program seeks the promotion and adoption of renewable energy technologies by removing and overcoming commercial barriers in order to reduce the costs of these emerging technologies.

The project's objective is to eliminate obstacles to the use of renewable energy in the Caribbean. Through concrete efforts to overcome policy, financing and capacity barriers and obstacles to raising awareness, it is estimated that the contribution of renewable energy to the region's energy balance will be significant.

4. Access to energy

In Belize, approximately 93 percent of the population has access to electricity.

Unfortunately, the use of fossil fuels makes energy in general very expensive because Belize is highly dependent on petroleum. It has large potential for the use of renewable energy and has four hydro-energy plants which at present have serious maintenance problems.

[21] Due to space limitations, only the two most important ones are cited.

BOLIVIA

1. Existing regulations

In 2008 the National Energy Efficiency Program *(Programa Nacional de Eficiencia Energética, PNEE)* was approved by means of Supreme Decree D.S. Nº 29.466, under the framework of the program "Electricity for living with dignity" *("Electricidad para vivir con dignidad")*. Its purpose is to establish policy actions and carry out projects aimed at incorporating the rational and efficient use of energy. Previously, the 2007 National Development Plan mentioned the subject of energy efficiency solely in the context of environmental services and the reduction of greenhouse gas emissions, indicating "changes in the energy matrix and efficiency in energy use" as the corresponding measures.

2. Institution responsible for energy efficiency

The Vice Ministry of Electricity and Alternative Energy, through the General Bureau of Electricity and Alternative Energy, is responsible for implementing the National Energy Efficiency Program. The Vice Ministry is an agency of the Ministry of Hydrocarbons and Energy, under the Executive Authority of Bolivia (http://hidrocarburos.gob.bo).

3. Organization and definition of national programs: programs under execution

The National Energy Efficiency Program, which began in March 2008, is currently under execution. The program began its activities with the optimization of electricity demand, promoting the displacement of electricity consumption outside of peak hours. This was done in coordination with the Office of the Superintendent of Electricity and with distribution companies.

Another aspect of the Energy Efficiency Program was the replacement of incandescent bulbs with compact fluorescent lamps. Publicity and educational campaigns were conducted throughout the country. As a result of the program, a reduction in demand, totaling around 240 MW (not verified) was expected in 2009.

4. Support to ESCOs

In Bolivia, no energy service companies meet the ESCO definition. There are individual consultants and entities such as the Center for Research on Renewable Energy *(Centro de Investigación en Energías Renovables, CINER)* and the Center for the Promotion of Sustainable Technologies, an agency of the National Chamber of Industries, that have conducted works and/or studies related to energy efficiency and clean production.

5. Schemes or mechanisms to finance energy efficiency efforts

Energy efficiency activities receive support from the national budget. The change from incandescent bulbs to CFLs included financing from the Peoples' Trade Agreement–Bolivarian Alternative for the Americas *(Alternativa Bolivariana de las Américas, ALBA)*. Bolivian banking institutions have no credit lines specifically aimed at energy efficiency projects.

6. Fiscal, economic or tariff incentives

Those incentives stemming from the agreement cited in paragraph 5 are in effect.

7. Market for efficient equipment

To date, the market for efficient lamps has been (partially) developed. The only regulations existing in Bolivia (issued by Bolivian Institute of Standardization and Quality *(Instituto Boliviano de Normalización y Calidad, IBNORCA)* (www.ibnorca.org) refer to efficient lamps. No regulations are in effect for other types of energy-consuming equipment.

8. Equipment labeling

This applies solely to CFLs imported from China (the label is printed in the place of origin).

9. Access to energy

Bolivia has 9.2 million inhabitants, with scattered populations in rural areas that are home to 4.2 million people (45 percent of the total population), characterized by high levels of poverty, limited access to and provision of basic services, geographic, cultural, economic and organizational diversity, and a high rate of internal migration.

Access to electricity (in %)

- 2001: Urban 89; Rural 24; Total 64
- 2007: Urban 89; Rural 39; Total 71

Programs or strategies implemented, under implementation or planned to facilitate access to sources in end-uses (social objective):

"Electricity for living with dignity" Program. Ministry of Hydrocarbons and Energy, 2008

The program assists in extending electricity networks and the use of renewable sources, placing emphasis on the end-use of electricity. It receives cofinancing from KfW, EUROSOLAR, GTZ, UNDP GEF, International Development Association (IDA), GPOBA (Global Partnership on Output-Based Aid) and the United Kingdom's Agency for Development Cooperation, and has the following targets:

- By 2010: To increase electricity service coverage from 39 percent to 53 percent in rural areas and up to 97 percent in urban areas
- By 2015: To make service universal in all urban areas and increase coverage to 70 percent in rural areas
- By 2020: Rural area 87 percent
- By 2025: To achieve universal service throughout the entire country

BRAZIL

1. Existing regulations

Federal Law No. 9.991 (2000) and its Regulatory Decree which states that one percent of the gross revenue of electricity distribution companies must be used for energy efficiency projects and research and development or R&D (this percentage has varied over time). A positive effect of this law is the emergence of ESCOs in Brazil.

Federal Law No. 10.295 (called the Energy Efficiency Law), approved in October 2001, and its Regulatory Decree, which dealt with the National Policy for Conservation and Rational Use of Energy. This law stemmed from Brazil's energy supply crisis in that year.

It established "the maximum levels of specific energy consumption, or the minimum levels of energy efficiency of machines and energy devices produced and sold in Brazil"; compliance is under the responsibility of the Management Committee for Energy Efficiency Indexes *(Comitê Gestor dos Índices de Eficiência Energética*, CGIEE).

2. Institutions responsible for energy efficiency

The Ministry of Mines and Energy *(Ministério de Minas e Energia, MME)* (www.mme.gov.br), through its Secretariat of Energy and Development Planning, is responsible for defining and implementing the national energy efficiency policy in Brazil.

Other institutions involved: Agência Nacional de Energia Elétrica (ANEEL, www.aneel.gov.br); Agência Nacional do Petróleo, Gás Natural e Biocombustíveis (ANP, www.anp.gov.br); Eletrobras through its PROCEL Program (www.eletrobras.gov.br/procel); Petrobras through its CONPET Program (www.conpet.gov.br).

3. Organization and definition of national programs: programs under execution

PROCEL: National Electrical Energy Conservation Program *(Programa Nacional de Conservação da Energia Elétrica)*. It has energy efficiency subprograms for the sectors of industry, commerce, housing, public buildings, lighting, energy management in municipalities and household electricity savings. (More information at website indicated in paragraph 2.)

CONPET: National Program for the Rationalization of Petroleum and Natural Gas By-products *(Programa Nacional da Racionalização do Uso dos Derivados do Petróleo e do Gás Natural)*, for the transportation, industrial (including Petrobras itself) and residential sectors.

PEE–Energy Efficiency Programs of Distribution Concessionaires *(Programas de Eficiência Energética das Concesionárias Distribuidoras)*: through this program, electricity distribution concessionaires annually allocate 0.25 percent of their net operating revenue to energy efficiency programs. These resources are mainly allocated to the following areas:

- Replacement of instant electric water heaters *("chuveiros")* with solar energy water heaters
- Replacement of refrigerators and lighting systems
- Adjustment of residential installations, performance contracts, etc.

4. Support to ESCOs

The National Development Bank of Brazil *(Banco Nacional de Desenvolvimento do Brasil, BNDES)* has launched a program of "Support to Energy Efficiency Projects *("Apóio a Projetos de Eficiência Energética– PROESCO")*, whose key recipients are: a) energy service companies *(empresas de servicios energéticos, ESCOs)*; b) energy generation, transportation and distribution companies; and c) end-users of energy. The scope, explanations and contacts are available at: http://inter.bndes.gov.br/espanol/proesco_es.asp.

The number of ESCO companies in Brazil, as well as their principal activities, can be viewed at: www.abesco.com.br.

5. Schemes or mechanisms to finance EE efforts

PROCEL's financing basically comes from Eletrobras's budget and the Global Reversion Reserve *(Reserva Global de Reversão, RGR)*, which are federal funds of electricity distribution companies, proportionate to the investment of each company. In 2007, the total investment in PROCEL activities was R$52.8 million (74 percent from Eletrobras).

Considering the 1986–2007 period, the total investment in PROCEL was R$1.02 billion, constituted by the RGR (R$628 million), Eletrobras (R$359 million) and the Energy Efficiency Program (R$37.5 million, a joint initiative by Eletrobras and GEF). This investment was highly relevant, making it possible to postpone investments in new electric power plants, estimated at R$19.9 billion in the same period.

Another important source of resources for energy efficiency in Brazil, the ANEEL Energy Efficiency Program, applied a total of R$1.4 billion from 2000 to 2007, assuring that each year about R$300 million, under ANEEL's supervision, should be used to increase energy efficiency and reduce electricity losses in projects carried out mainly by ESCOs. The investment in CONPET has generally not been revealed in detail, but according to information from MME, it was approximately R$4.0 million in 2008; these resources mostly come from the Petrobras budget.

In addition, there is the Program for Support to Energy Efficiency Projects *(Programa de Apóio a Projetos de Eficiência Energética, PROESCO)*, a financial mechanism created by the National Bank for Economic and Social Development *(Banco Nacional de Desenvolvimento Econômico e Social, BNDES)* to promote and support energy efficiency projects, with preference for those proposed by or associated with the execution of ESCOs. In 2009, the Inter-American Development Bank approved a guarantee instrument to support energy efficiency projects that are carried out by ESCOs in buildings. The amount of this program is US$25 million, of which US$15 million are from IDB and US$10 million from GEF.

At state level, in 2009 and 2010 IDB approved technical cooperation resources for the States of São Paulo, Minas Gerais and Pará for US$1 million each, to support energy efficiency projects for, respectively, the São Paulo State Secretariat of Sanitation and Energy *(Secretaria de Estado de Saneamento e Energia, SSE)*, Cemig Distribuição S.A., Centrais Elétricas do Pará S.A. (CELPA) of the Grupo Rede Energia.

For projects carried out by end-users (large-scale industrial, commercial and residential), there are two ways to obtain financing:

- Directly, through official credit institutions of the Federal Government, as well as from international financiers such as BNDES, the Financiadora de Estudos e Projetos (FINEP), the Caixa Econômica Federal do Brasil (CEF), the World Bank, the IDB and the Banco do Brasil;

- Through Energy Service Companies *(Empresas de Serviços Energéticos, ESCOs)* that carry out the necessary investments, being reimbursed based on the savings achieved in the projects.

In turn, the World Bank has financed a study on economic development with low carbon emissions. This study will contribute to the evaluation of long-term development options and strategies with low carbon intensity. In addition, the World Bank, through Eletrobras, will finance a project to improve the quality of distribution services in six state distribution companies, for US$495 million.

6. Fiscal, economic or tariff incentives

Law 9.991/2000 established the financial mechanisms for energy efficiency projects and for RandD (in EE) by electricity distribution companies. There are no specific contributions from Brazil's federal budget for energy efficiency projects, other than those allocated by the PROCEL, CONPET and PBE programs, plus the activities of the Electrical Energy and Petroleum Agencies (ANEEL and ANP).

7. Market for efficient equipment

For a long time, Brazil has implemented policies aimed at energy efficiency, with particular intensity since the 2001 electricity supply crisis. An important component of these policies has been the energy efficiency labeling programs. The size of the Brazilian market has made it possible to develop local laboratories that support these labeling programs. The Brazilian laboratories are modern, have highly skilled human resources, and are included in worldwide accreditation systems. In addition, Brazil is aligned with international standardization and is an important promoter of standardization at regional level.

The principal efficient equipment in the Brazilian market is cited in paragraph 8.

8. Equipment labeling

The Brazilian Labeling Program *(Programa Brasileiro de Etiquetado, PBE)*: PBE's objective is to encourage the production and use of safer, more efficient equipment. PBE's efforts, under the scope of the Federal Government's energy efficiency programs, are coordinated by the National Institute of Metrology, Standardization and Industrial Quality *(Instituto Nacional de Metrologia, Normalização e Qualidade Industrial, INMETRO)* (www.inmetro.gov.br), with the collaboration of the Brazilian Association of Technical Standards *(Associação Brasileira de Normas Técnicas, ABNT)* (www.abnt.org.br), as well as that of commercial associations or professional associations of the various sectors, in terms of the type of equipment labeled.

The products already labeled under the scope of the Brazilian Labeling Program are:

- Refrigerators, combined cold storage units, vertical and horizontal freezers;
- Electric hot water heaters and hydro-massage heaters;
- Household and split air-conditioning devices;
- Three-phase electric motors;
- Washing machines;
- Compact fluorescent, incandescent and decorative lamps;
- Electromagnetic reactors for sodium vapor lamps and compact fluorescent lamps;
- Flat solar collectors for bathrooms and swimming pools, thermal boilers and coupled collectors;
- Household gas stoves and ovens;
- Immersion heaters and hot water heaters;
- Lightweight vehicles.

9. Access to energy

Around 1,000 energy plants are currently supplying electricity to cities and isolated villages in Amazonia, using diesel oil as a fuel. Nearly 700 units form an installed capacity of slightly less than 500 kW. In particular, there was a lack of incentives and obligations to implement rural electrification programs, especially in Amazonia, as well as to improve the supply to low-income consumers and to maintain existing off-grid projects.

Rural electrification in Brazil

Rural electrification through connections to the grid is generally not economically viable (or affordable); the provision of energy in these cases must be decentralized, and this is an excellent opportunity to introduce energy from renewable sources. The provision of electricity plays an important role in increasing the standard of living through high-quality lighting, drinking water, medical care, and communications. A frequently mentioned figure for a minimum level of consumption is 600 kWh per family per year (or 50 kWh per household per month).

The current rural electrification programs in Brazil are:

***Luz no Campo* (Light in the Countryside)**

The major rural electrification program under way since 1999: 2,235,025 kVA installed, 560,000 families assisted, 2.8 million people

Program for Energy Development in States and Municipalities *(Programa para o Desenvolvimento Energético de Estados e Municípios, PRODEEM*): Started in 1994

Principal off-grid electrification program sponsored by the Government:

- 1996–1999: 3 MW installed in photovoltaic energy for 3,050 villages; 604,000 people benefited
- 2000: 1,050 household solar systems; 104,000 people benefited
- 2001: 1,086 SHS (solar heating systems); 3,000 community systems

PRODEEM's objective was to generate energy for isolated localities that were not served by the conventional grid, using local renewable energy. Since 2003, it was incorporated in the *"Luz para Todos"* Program. PRODEEM had positive results in the installation of photovoltaic systems in isolated communities, but despite these achievements the impact of the abovementioned experiences has been relatively limited.

***Luz para Todos* (Light for All): Under way since October 2003**

- Access to energy for 12 million inhabitants by 2008
- Required investment of R$7 billion: R$5.3 billion from the Federal Government and R$1.7 billion from state governments and public utilities.

Access to liquefied petroleum gas (LPG)

- Distribution network throughout the country
- Accessible by 98 percent of Brazilian households and 93 percent of rural households (2002 Census).
- Replaced firewood
- From 1950 to 2001, the Federal Government of Brazil regulated the end-prices of LPG to consumers
- Subsidized leveled prices administered throughout the country.

As of 2000, around US$100 million was spent each year to subsidize LPG in Brazil. In 2002, subsidies were eliminated and the international prices of the product were passed on to the consumer.

Law 10.453/02 created a program called *Auxílio-Gás* (literally, “assistance for the use of liquefied gas”), which transferred subsidies to low-income families for residential LPG. The subsidies are currently included in the *"Bolsa Família"*, but the previous policy appeared to be better suited for encouraging the use of LPG, since it reached all consumers.

Amazonia: access to energy. Current status

High consumption of diesel oil in isolated communities: 810,000 m^3 per year. Brazil imported 2.7 million m^3 of diesel (for about US$827 million). High fuel costs, not affordable for the local population.

CHILE

1. Institution responsible for energy efficiency

Chile has no laws or decrees that deal specifically with the promotion of energy efficiency.

The entity responsible for the development of energy efficiency in Chile is the Chilean Agency for Energy Efficiency *(Agencia Chilena de Eficiencia Energética)*, officially created in April 2010. It is the institutional continuation of the Energy Efficiency Country Program *(Programa País de Eficiencia Energética, PPEE)* (www.ppee.cl), launched in March 2005, which began operating under the scope of the Ministry of Economy, Development and Reconstruction *(Ministerio de Economía, Fomento y Reconstrucción)*.

2. Schemes or mechanisms to finance energy efficiency efforts

The principal efforts conducted to date were supported financially by the government budget, which has increased more than thirty-fold since its start in 2005. Another source of financing for energy efficiency projects is the Chilean Development Agency *(Agencia Chilena de Desarrollo)*, and the Corporation for Production Development *(Corporación de Fomento de la Producción, CORFO)* (www.corfo.cl), whose credit lines include the "CORFO Credit for Energy Efficiency. IDB has also provided support for designing carbon finance schemes related to energy efficiency.

3. Fiscal, economic or tariff incentives

Several efforts may be interpreted as incentives for the promotion of energy efficiency. These are: a) incentives for truck replacement; b) lightbulb exchange ("Lighting with good energy" program *[Programa "Ilumínate con buena energía"]*); c) subsidy for thermal reconditioning in new and used homes; d) incentive for the introduction of efficient motors (from 1 to 10 HP) in its "Use efficient motors" *("Usa motores eficientes")* program for industry; e) efficient lighting program in municipalities; and f) tax exemption for the installation of solar collectors.

4. Market for efficient equipment

The market for efficient equipment in Chile refers to compact fluorescent lamps (called *"ampolletas"* in Chile) and to household refrigerators and freezers. There is a regulation for the efficiency of the latter two.

5. Equipment labeling

A study is currently under way to measure the impact of labeling, but initial results already show how the supply of lamps and refrigerators/freezers has changed, increasing the use of more efficient products.

6. Access to energy

Rural Electrification Program

This is a decentralized program that began in 1994, executed by the Under-Secretariat of Regional Development *(Subsecretaría de Desarrollo Regional, SUBDERE)* and the National Energy Commission *(Comisión Nacional de Energía, CNE)*, with the following sources of financing:

- Rural electrification budget under the National Fund for Regional Development *(Fondo Nacional de Desarrollo Regional, FNDR-ER)*
- 2001–2008 IDB Credit

- 2009 subsidy for the consumption and operation of isolated systems
- Financing structure: 70 to 90 percent subsidy on investment, 10 percent contribution by users, 20 to 10 percent electricity companies or cooperatives.

Targets of the PER:

- 1994–2000: 75% national coverage
  90,000 homes, subsidies US$115 million (national budget)
- 2000–2006: 90% national and regional
  46,000 homes, subsidies US$135 million (BID)
- 2006–2010: 96% national.
  22,000 houses, coverage 95%
- 2010–2014: Maintain 96% and improve the quality of provision in isolated systems

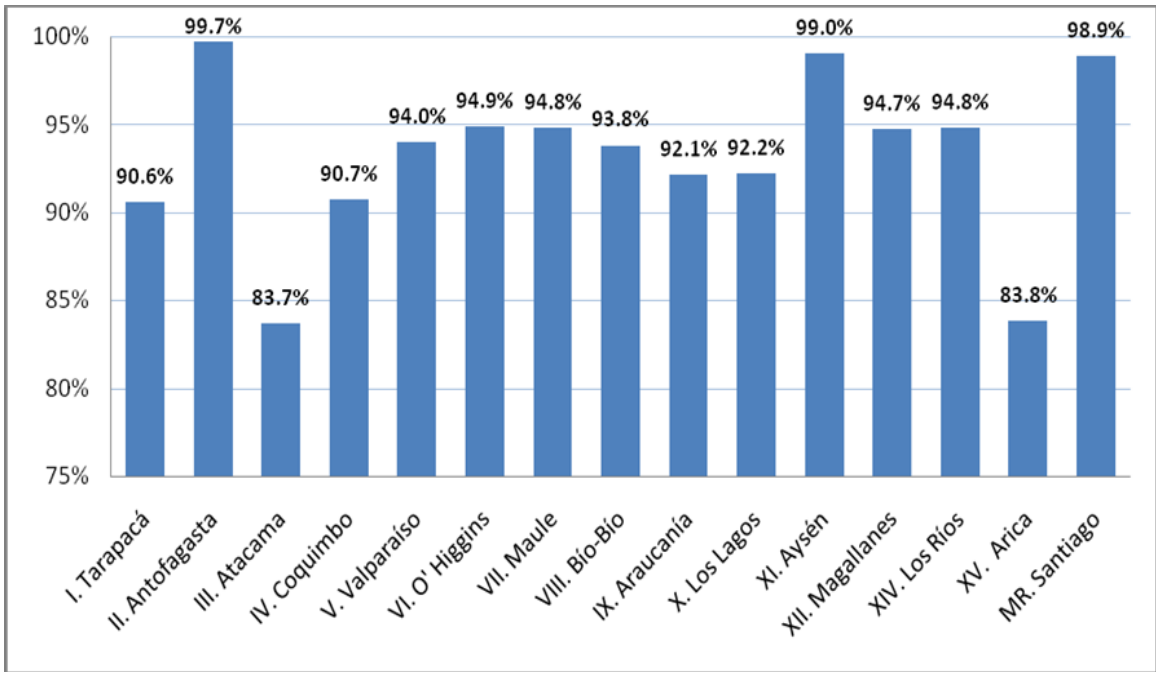
GEF-UNDP-CNE Project: "Removal of Barriers to the Use of Renewable Energy in Rural Electrification." (GEF: US$6 million, non-reimbursable, 2001–2007.)

Rural and Social Energy Program *(Programa de Energización Rural y Social, PERS)*

To increase access to energy, favoring the use of non-conventional rural electrification *(electrificación rural no convencional, ERNC*).

- Component 1: houses and public establishments with ERNC solutions
- Component 2: users and decision makers trained in and informed about ERNC
- Component 3: development of credit lines and instruments to support energy projects

Coverage of electrification at regional level in Chile



COLOMBIA

1. Existing regulations

Law 697 of October 2001 promotes the rational, efficient use of energy and the generation of energy through renewable resources; its Article 4 decreed that the Ministry of Mines and Energy is the entity in charge of promoting, organizing and ensuring the development and monitoring of programs for the rational use of energy; its Article 5 decreed the creation of the Program for the Rational and Efficient Use of Energy *(Programa de Uso Racional y Eficiente de la Energía, PROURE)*. Decree 3683 of 2003 regulated Law 697 and created the Intersectoral Commission for the Rational and Efficient Use of Energy and Non-conventional Sources of Energy *(Comisión Intersectorial para el Uso Racional y Eficiente de la Energía y Fuentes No Convencionales de Energía, CIURE)*. In 2006, the subprograms that form part of PROURE were defined. In 2007, Decree 2501 of the Office of the President of the Republic was enacted; it stated provisions for promoting practices for the efficient use of energy. With regard to regulations to promote the co-generation of energy, there is a Legal and Regulatory Framework (Law 1215 of 2008).

2. Institution responsible for energy efficiency

The Mining and Energy Planning Unit *(Unidad de Planeación Minero-Energética, UPME)* (www.upme.gov.co), under the Ministry of Mines and Energy (*Ministerio de Minas y Energía*) is one of the key stakeholders at the government level. Since 2004, through a presidential decree, it has been assigned the duty of preparing, on a priority basis, programs and projects related to energy saving in all fields of economic activity and to carry out all necessary dissemination efforts.

3. Organization and definition of national programs: programs under execution

The Program for the Rational and Efficient Use of Energy *(Programa de Uso Racional y Eficiente de la Energía, PROURE)* is under execution. This program was prepared with technical assistance from the Inter-American Development Bank (IDB) in 2008. The subprograms that form it (since 2006) are:

1) Culture, research and promotion of URE and prospective analysis of new technologies for energy transformation related to it;
2) Promotion and development of projects with non-conventional energy sources and energy efficiency, including clean or renewable energy projects, with priority given to non-interconnected zones;
3) Architectural buildings and associated equipment for URE;
4) Control of energy losses;
5) Climate change and initiatives for a methane market and carbon sequestration and capture;
6) Encouragement and incentives for URE technologies, products and projects for the full or partial use of non-conventional energy;
7) Cleaner production and energy-saving and -efficiency projects or activities that require equipment, elements and machinery aimed at reducing energy consumption and/or energy efficiency;
8) Promotion of URE in the official, commercial, transportation, residential (including housing of social interest), and industrial (Medium and Small Businesses *[Medianas y Pequeñas Empresas, PyMEs]* and Energy Service Companies *[Empresas de Servicios Energéticos, ESCOs]*) sectors;
9) Replacement of traditional fuels with other, potentially cleaner fuels, and specifically the promotion and use of biofuels;
10) Updating and/or technological conversion of industrial equipment in terms of URE.

4. Support to ESCOs

Point 8) of the PROURE Program mentions support for the creation of ESCOs but there is no record of positive outcomes in this regard.

5. Schemes or mechanisms to finance energy efficiency efforts

PROURE is carried out with budget resources from the Ministry of Mines and Energy, through the Mining and Energy Planning Unit. An additional source of financing for energy efficiency activities is FINDETER *(Financiera de Desarrollo Territorial S.A.)* (www.findeter.gov.co), an entity that, among other things, supports the energy sector and finances activities related to all types of energy from traditional, alternative or non-conventional renewable and non-renewable sources. It finances:

- Loss management and reduction programs, and
- Pre-investment and investment in all stages of the project cycle until commercialization (including co-generation and self-generation).

The energy sector is ranked fourth in terms of magnitude within FINDETER disbursements, and represents eight percent of the total of all of them.

6. Fiscal, economic or tariff incentives

UPME, together with the Institute for Industrial Development *(Instituto de Fomento Industrial, IFI)* and the Bank for Business Development and Foreign Trade of Colombia *(Banco de Desarrollo Empresarial y de Comercio Exterior de Colombia, BANCOLDEX)* (www.bancoldex.com), has designed a indirect incentive scheme to support the incorporation of efficient technologies and the optimization of the use of energy in productive sectors through credit lines.

7. Market for efficient equipment

Decree 2501 of the Office of the President of the Republic stated with regard to the subject of efficient equipment:

- Article 1. Objective and field of application. The measures indicated in the present Decree to promote the rational and efficient use of electrical energy, in the following products and processes:
    1. In the products used in the transformation of electrical energy, both nationally produced and imported, for commercialization in Colombia: a) Transformers for electrical power and distribution; and b) Generators of electrical energy.
    2. In products aimed at the end-use of electrical energy, both nationally produced and imported, for commercialization in Colombia, in the following processes:
        a) Lighting; b) Refrigeration; c) Air conditioning; d) Power; f) Water heating for household use; g) Heating for cooking.
    3. Buildings where public agencies operate
    4. Housing of social interest
    5. Public lighting systems
    6. Traffic light systems

8. Equipment labeling

Article 2 of Decree 2501 "Technical regulation for the purposes of energy efficiency" *("Reglamento técnico con fines de eficiencia energética")* mentions that the Ministries of Mines and Energy, and of Commerce, Industry and Tourism will issue technical regulations for the design and placement of labeling for the purpose of rational and efficient use of electrical energy, applicable to the products cited in paragraph 7.

9. Access to energy

General statistics:

- Population with access to electricity nationwide: total 97.2%, urban 99.4%, rural 89.4%.
- Population with access to natural gas nationwide: total 47.4%, urban 59.8%, rural 3.4%.

(Source: Quality of Life Survey *[Encuesta de Calidad de Vida]*)

In the rural sector, over 55 percent of households use firewood for cooking; this indicates that a significant gap remains to be covered. This occurs in the poorest regions of the country, despite the high level of electricity coverage.

There is a wide gap between the urban and rural sectors in terms of access to modern equipment.

Policies with regard to access to energy and payment capacity

Distributive mechanism:

- Contributions and subsidies on electricity and natural gas.
- Stratification (E1 poorest to E6 richest)
- Subsidies on E1: up to 60%
- Subsidies on E2: up to 40%
- Subsidies on E3: up to 15%
- Contributions 20% E5, E6, commercial sector and industrial sector
- Subsidy limit: subsistence consumption (130 kWh in cold zones and 160 kWh in hot zones)

COSTA RICA

1. Existing regulations

Law 7447. Regulation on the Rational Use of Energy, 1994. This law granted incentives to high-cost projects or investments for the efficient use of energy. These investments had to be greater than 15 percent of a company's annual electricity cost, with a prior determination of national interest and profitability. Once they complied with the above, the companies had the right to the following benefits:

- Cofinancing of 50 percent of the total amount of the investment of "high-cost investment measures" or discounts in the billing of electricity or petroleum by-products, 20 percent of the amount equivalent to annual energy savings, resulting from the application of such measures, for a period of two years.

- Awards to companies whose technological adaptation, assimilation and innovation generate economic and social benefits for the country.

This law authorized the following to execute programs for the rational use of energy by themselves or by means of other public or private agencies:

Ministry of Environment and Energy *(Ministerio de Ambiente y Energía, MINAE)*; National Power and Light Company *(Compañía Nacional de Fuerza y Luz, CNFL)*; Costa Rican Petroleum Refinery (*Refinadora Costarricense de Petróleo S.A., RECOPE)*; Costa Rican Electricity Institute *(Instituto Costarricense de Electricidad, ICE)*; National Electricity Service *(Servicio Nacional de Electricidad, SNE)*; Public Utilities of Heredia *(Empresa de Servicios Públicos de Heredia, ESPH)*; Administrative Committee for Electricity Services of Cartago *(Junta Administrativa de Servicios Eléctricos de Cartago, JASEC)*.

These incentives were later repealed in 2001 through a new Tax Efficiency Law.

2. Institution responsible for energy efficiency

The Sectoral Bureau of Energy *(Dirección Sectorial de Energía, DSE)* under MINAE (www.dse.go.cr) is the leading organization in comprehensive energy planning for decision making in the energy sector. During 2009, DSE carried out a series of initiatives related to the subject of energy efficiency:

- A consultancy was conducted, entitled "Technical and Economic Assessment of Technological Options for Using Biomass as an Energy Source" *("Evaluación Técnico Económica de Opciones Tecnológicas para el Aprovechamiento de la Biomasa como Fuente Energética")*.

- Together with the Institute for Technical Regulations of Costa Rica *(Instituto de Normas Técnicas de Costa Rica, INTECO)* (www.inteco.or.cr]), at least three regulations are being formulated for efficient vehicles with cleaner technologies: the study is entitled "Preparation of regulations for energy efficiency and environmental performance of automobiles using internal combustion" *("Elaboración de Normas de Eficiencia Energética y desempeño ambiental de vehículos automotores de combustión interna")*.

Other institutions dealing with energy efficiency:

Costa Rican Electricity Institute (*Instituto Costarricense de Electricidad*, ICE) (www.grupoice.com)

The Costa Rican Electricity Institute forms part of the Grupo ICE, together with the National Power and Light Company *(Compañía Nacional de Fuerza y Luz, CNFL)* and the area of telecommunications. Among activities related to more efficient use of energy by Costa Rican consumers, ICE's website presents "Savings Advice" *("Consejos de Ahorro")* for the residential and business sectors.

National Power and Light Company (*Compañía Nacional de Fuerza y Luz S.A., CNFL)* (www.cnfl.go.cr)

CNFL is a Costa Rican state enterprise that distributes electricity in the country's most densely populated area, the central region or Greater Metropolitan Area.

The Bureau of Innovation and Energy Efficiency *(Dirección de Innovación y Eficiencia Energética)* operates in CNFL, offering to citizens interested in learning about and implementing programs on efficient use of energy a series of services that range from educational programs to technical studies in order to identify alternatives that involve energy conservation. CNFL offers Efficient Use of Energy services, advisory services and promotion of measures for the efficient use of energy.

3. Organization and definition of national programs: programs under execution

ICE's energy efficiency activities: Efficient Lamp Program: 3x2 promotion of compact fluorescent lamps.

In turn, CNFL has been carrying out various activities specially aimed at its customers, such as:

Energy Efficiency Advisory Services, Tele-Advisory Services, Program for Energy Efficiency in the Public Sector, Efficient Lighting Project, Program for Energy Efficiency in the General Sector, Electricity Audits, Large-Scale Consumer Project, Metering Systems in Disadvantaged Areas, Advisory Programs for Communication on Energy Efficiency and Electricity Savings, Teacher Training Program.

4. Schemes or mechanisms to finance energy efficiency efforts

The economic resources available to the key stakeholders cited in paragraph 2) come from their respective institutional budgets.

BAC International Bank will carry out a program with small and medium businesses *(pequeñas y medianas empresas, PyMEs)* of Central America so that they can use energy more efficiently.

Examples of initiatives that could be carried out include: replacement of lighting equipment and motors, and solar, wind and water projects. This plan will be carried out with the support of an agreement that BAC International Bank signed with the Inter-American Investment Corporation (IIC), the financial arm of the Inter-American Development Bank. BAC International Bank will offer lines of financing for PyMEs interested in conducting energy efficiency projects.

IIC will provide financing for this project as part of its corporate social responsibility objective. In Costa Rica, BAC has loaned $40 million to these companies.

5. Fiscal, economic or tariff incentives

The Draft of the General Electricity Law, Chapter 10, "Energy efficiency projects. Exemptions", states that:

"The equipment, machinery or electrical elements that compose electrical energy efficiency systems under the conditions specified in the present Law and that are contained in the catalog of technologies for

electrical energy efficiency administered by the Market Administration Authority, are exempted from all taxes."

This Draft Law proposes the creation of the National Electricity Fund *(Fondo Nacional de Electricidad, FONAE)*, in the public interest and exempt from tariff taxes, taxation, and surcharges for purchases and sales of goods and services, as well as investments and revenue obtained for compliance with its purposes.

6. Market for efficient equipment

The Institute for Technical Regulations of Costa Rica (*Instituto de Normas Técnicas de Costa Rica, INTECO)* is developing a methodology for the implementation of the Energy Efficiency Standardization Project *(Proyecto de Normalización de Eficiencia Energética)* and for labeling. The steps to be taken for this implementation are as follows (view more information at www.comccanor.org/CTN_Eficiencia Energética):

- Analysis of political, institutional and cultural factors.
- Establishment of political legitimacy.
- Consideration of regional harmonization.
- Research on information needs.
- Selection of products and set priorities.

INTECO's role with regard to energy efficiency is very important and highly dynamic. Progress in the past two years has been very significant in terms of the process of generating energy efficiency standards.

Electricity-consuming equipment, for which work is being conducted to generate energy efficiency standards in Costa Rica, includes: self-contained commercial refrigeration devices; alternating current three-phase induction engines; household refrigerators and freezers; lighting equipment (compact fluorescent lamps); air conditioning equipment; food cooking equipment.

7. Equipment labeling

The equipment with informational labeling on energy consumption in Costa Rica includes:

Commercial refrigeration devices; household refrigerators and freezers; compact and circular fluorescent lamps; alternating current three-phase induction engines, squirrel-cage rotor type, with nominal power ranging from 0.746 to 373 kW.

8. Access to energy[22]

Energy policy: the objective of the universal access policy is "that access to energy for the entire population becomes a reality".

General Electricity Law: "Develop a transparent system of Universality and Solidarity with regard to contributors and beneficiaries (National Electricity Fund *[Fondo Nacional de Electricidad, FONAE]*), for the purpose of ensuring universality and solidarity in service, as well as rural electrification and public lighting projects."

FONAE: is created as an instrument aimed at financing compliance with the objectives of universal access, universal service and solidarity in the provision of electrical service, established in the Law. This fund is

[22] From Nobelty Sánchez's presentation from the Dirección Sectorial de Energía in the Latin America and Carribean workshop "Poverty and Access to Energy", CEPAL, Santiago de Chile, October 2009.

administered by the Office of the Superintendent of Energy *(Superintendencia de Energía, SUEN)*, under the conditions stipulated in the Law and its regulations. Projects:

a) Electrification of geographic areas or provision of electricity in isolated systems not connected to the SEN.
b) Lighting of city zones, vehicular traffic routes or public areas.

Evolution of national electricity coverage in Costa Rica

- 1970: 47.3%
- 2009 (May): 98.9%

ICE–UNDP Rural Electrification Program *(Programa de Electrificación Rural)*

1.2 percent of the population lacks access to the conventional electrical grid. This population lives in rural, isolated and geographically scattered areas. ICE, in accordance with the law that created it, has brought electricity service to this population through the establishment of photovoltaic systems. These systems were placed in 7,273 households and 329 small rural communities, and serve 33,000 people who were previously without electricity.

CUBA

1. Existing regulations

Issuance of Resolutions on the Efficient and Rational Use of Energy

- 2005 Resolution 190 MINBAS (Ministry of Basic Industry *[Ministerio de la Industria Básica]*)/MINCEX (Ministry of Foreign Trade *[Ministerio de Comercio Exterior]*): Prohibition on the importation of incandescent bulbs.
- 2007 Resolution 328 MINBAS: Creation of the Bureau for the Supervision of Energy Carriers *(Dirección de Supervisión de los Portadores Energéticos)*.
- 2008 Resolution 316 MICONS (Ministry of Construction [*Ministerio de la Construcción]*): Mandatory implementation of compliance with Cuban Regulation NC 220 Construction. Design requirements for energy efficiency.
- 2009 Resolution 136 MINBAS: Implementation of the Technical Regulation on energy efficiency in equipment for end-use of electrical energy, imported or nationally produced.
- 2009 Resolution 7909 MEP (Ministry of Economy and Planning [*Ministerio de Economía y Planificación]*): Implementation of work system for control of electricity consumption in the Non-residential Sector.

2. Institution responsible for energy efficiency

The key entity responsible for energy efficiency in Cuba is the Bureau for the Rational Use of Energy (*Dirección de Uso Racional de la Energía)*, under the National Electrical Union *(Unión Nacional Eléctrica)* which in turn is under the authority of the Ministry of Basic Industry (*Ministerio de la Industria Básica)*. Energy issues are handled through the following institutional scheme:

The Ministry of Economy and Planning *(Ministerio de Economía y Planificación)* is responsible for defining national energy policies. Provincial and municipal governments and agencies of the State's Central Administration have the chief responsibility for implementing them.

The Ministry of Basic Industry (*Ministerio de la Industria Básica, MINBAS)* sets general energy policy guidelines and approves the set and level of tariffs proposed by the National Electricity Union (*Unión Nacional Eléctrica, UNE)*, and then submits them to the Council of Ministers for ratification.

The National Electricity Union (*Unión Nacional Eléctrica*, UNE), under the authority of the Ministry of Basic Industry, is the national agency in charge of the generation, transmission, distribution, commercialization and rational and efficient use of electrical energy throughout the country.

The following operate under UNE: (i) the Bureau for the Rational and Efficient Use of Energy *(Dirección de Uso Racional y Eficiente de la Energía)*, and (ii) nine Administrative Bureaus, under which 15 distribution companies operate throughout the island. Each of them has Grassroots Business Units for the Rational and Efficient Use of Energy *(Unidades Empresariales de Base de Uso Racional y Eficiente de la Energía)*, with a total of 300 specialists who work directly in each municipality, implementing the country's guidelines on the subject of energy efficiency, and 103 energy supervisors who conduct audits.

National Group for Energy Saving and Efficiency *(Grupo Nacional para el Ahorro y la Eficiencia Energética)*

In 2007, a consultative group was created in Cuba with the objective of comprehensively coordinating and executing all actions related to energy efficiency in the country. It is composed of specialists from the State's

Central Agencies (consumers), Project Companies, Energy Service Companies, Cuba Energía (an enterprise specializing in the management of energy information), equipment testing laboratories, the Bureau for the Rational Use of Energy *(Dirección de Uso Racional de la Energía)* under the Electrical Union *(Unión Eléctrica)*, and the Energy Efficiency Network *(Red de Eficiencia Energética)*, formed by all of the country's technical universities.

3. Organization and definition of national programs: programs under execution

National programs 2006–2009:

- 2,400 MW of generation, distributed using high-efficiency engines, were synchronized. This made it possible to increase generating efficiency due to the low cost of inputs and indexes of fuel consumption. In 2011, the installation of 120 MW using these technologies is planned.
- Replacement efforts conducted in distribution networks: 80,000 improvement efforts will be carried out in 2010, and 23 (110 kV) substations will be put into service.
- 9.4 million (100 percent) incandescent lightbulbs were replaced with compact fluorescent lamps, and 4.4 million inefficient appliances were replaced.
- Work is being conducted to replace kerosene cook stoves with electric ones, through the delivery of electric cooking modules.
- Over 2,500 inefficient water pumps were replaced with efficient ones in aqueducts and sewers.
- Over 807,000 (32 W) fluorescent lamps were installed, and electronic ballasts replaced 40 W ones and electromagnetic ballasts.
- Carry out energy supervisions
- Implementation of a work system to control electricity consumption

4. Schemes or mechanisms to finance energy efficiency efforts

Resources allocated to carrying out energy efficiency programs and projects come from the National Budget.

5. Market for efficient equipment

Cuba has a technical regulation on energy efficiency with regard to the end-use of electrical equipment; it has been in effect since 2009, in accordance with MINBAS Resolution No-136. It establishes and controls technical requirements for energy efficiency, electrical safety and tropicalization of the principal equipment for End-use of Electrical Energy, manufactured or assembled in the country, in order to allow it to be commercialized.

Equipment included in the regulation: refrigerators, fans, CFLs, microwave ovens, irons, air conditioners, washing machines, rice cookers.

There are four laboratories authorized by the Bureau for the Rational Use of Energy where trials and tests are conducted on equipment, in accordance with regulations approved by the Cuban Electro-technical Committee (*Comité Electrotécnico Cubano,* CEC). The website www.cubaenergia.cu publishes the equipment that has been accepted, rejected or is in the process of obtaining the technical acceptance endorsement.

6. Equipment labeling

Refrigerators require the inclusion of the energy efficiency label, a mandatory requirement so that they can be commercialized in the country.

7. Access to energy

96 percent of the population receives electricity from the National Electrical Energy System (*Sistema Electroenergético Nacional, SEN).* The zones without access to this service are more remote, mountainous areas where the level of rural electrification through all means and sources is 81 percent.

Cuba's mountainous zones represent 17 percent of the country's territory and are home to 6.5 percent of the total population. Prior to 1990, isolated communities in mountainous zones received minimum electricity service supplied by diesel-powered generating plants.

The electrification of rural residents' homes through solar energy constitutes a sustainable, ecologically friendly solution. Due to these communities' location far from the SEN, it is also the most economical solution.

An electrification project is in place to progressively resolve the needs of some 100,000 families in the country's remote and isolated rural zones.

DOMINICA

1. Existing regulations

Dominica currently has no national energy policy that regulates or serves as a framework for energy issues in general.

At present, the Government is working actively to establish a national energy policy, supported by the Sustainable Development Department of the Organization of American States (OAS) through the Caribbean Sustainable Energy Program (CSEP).

The electricity sector is regulated by the Electricity Supply Act (2006), which specifies that the regulatory agency will be the Independent Regulatory Commission (IRC), under the authority of the Ministry of Public Works, Energy and Ports.

2. Institution responsible for energy efficiency

At present, there is no institution responsible for energy efficiency. For now, under the Ministry of Public Works, Energy and Ports, a renewable energy program is being conducted.

3. Organization and definition of national programs: programs under execution

CSEP: Caribbean Sustainable Energy Program

The program is implemented by the energy and climate change section of the Sustainable Development Department of the OAS. This program seeks to increase the sustainability of the energy sector in the Caribbean by improving governance and management.

The project's main objective is to accelerate the transition toward cleaner types of energy and their more sustainable use. Its specific objective is to take into consideration market conditions for the development and use of renewable energy and energy efficiency systems through the mitigation of current barriers to their introduction.

More details at: http://www.sepa-americas.net/proyectos_detalle.php?ID=6

LCCA: Low-Carbon Communities of the Americas

Project supported by the United States Department of Energy (DOE) and the OAS. This project will make it possible to expand the development and use of renewable energy and energy efficiency systems, helping to increase the sustainability of energy supply and reduce carbon emissions.

The project's objective is local training through technical programs on how to conduct an energy efficiency audit and evaluate the modernization that is needed. It will also place emphasis on strengthening communities' capacities; in particular, local renewable resources will be evaluated and studied.

The European Union is financing a project entitled "Preparation of a Geothermal-based Cross-Border Electrical Connection in the Caribbean" in which Dominica, due to its potential, will be one of the countries that provide energy to the inter-island network.

CREDP: Caribbean Renewable Energy Development Programme

This program is financed by UNDP and GEF, technically supported by the OAS and implemented by CARICOM. The program seeks the promotion and adoption of renewable energy technologies by removing and overcoming commercial barriers in order to reduce the costs of these emerging technologies.

The project's objective is to eliminate obstacles to the use of renewable energy in the Caribbean. Through concrete efforts to overcome policy, financing, and capacity barriers and obstacles to raising awareness, it is estimated that the contribution of renewable energy to the region's energy balance will be significant.

Geo-Caraïbes: OAS and UNEP

OAS, UNEP and other partners promoted the use and exploration of Dominica's geothermal resources through the Caribbean Geothermal Development Project (Geo-Caraïbes). This project was launched in 2005 and was financed by the Global Environment Facility (GEF). Its objective was to create a favorable framework for the commercial development of geothermal energy in the Eastern Caribbean. Work was conducted on technical aspects (for example, the quantification of potential), the legal framework (for example, legislative and policy reforms and the strengthening of local institutions), and financial considerations (for example, the launch of a risk capital fund for geothermal energy drilling).

4. Access to energy

Nearly 99 percent of Dominica's population has access to electricity.

DOMINICAN REPUBLIC

1. Existing regulations

General Electricity Law, No. 125-01, modified by Law No. 186-07 of August 2007. This law establishes the new legal and institutional framework that governs the activities of the sectors of electricity, hydrocarbons, and alternative sources and rational use of energy, that is, the energy sector in general.

With regard to energy efficiency, Law 125-01, which creates the National Energy Commission *(Comisión Nacional de Energía)* and assigns it the responsibility of regulating and creating policies, regulations and programs dealing with energy efficiency, and other legal initiatives that promote energy efficiency, such as customs duty exemptions on compact fluorescent lamps. Article 14 said Law states: "Promote the rational use of energy."

The Dominican Republic has no law that deals specifically with promoting energy efficiency. However, the Action Plan cited in 3) contains the point entitled "Preparation of the Draft Energy Efficiency Law."

2. Institution responsible for energy efficiency

The National Energy Commission *(Comisión Nacional de Energía, CNE)* is an institution of the Dominican Government that was created through General Electricity Law (*Ley General de Electricidad,* LGE) No. 125-01, indicated in Article 7. The Law was enacted on July 26, 2001.

3. Organization and definition of national programs: programs under execution

The Dominican Republic has an Action Plan on the subject of energy efficiency and development. This Plan, in Axis *(Eje)* 1 – Energy Saving and Efficiency, has the objective of developing actions and measures aimed at producing results in terms of energy saving and efficient use of energy in the residential, transportation, commercial, government and industrial sectors.

Energy efficiency program in public buildings

- Formation of Institutional Committee for the Rational Use of Energy (*Comité Institucional para el Uso Racional de Energía,* CIURE);
- Training on energy efficiency for CIURE and general personnel of the institution;
- Conduction of energy audits.

Training for private sector companies (industries)

- Talks on the importance of adopting measures for the rational use of energy;
- Seminars, workshops.

Preparation of Draft Energy Efficiency Law

- Implementation of traffic lights with timers and Light Emission Diode (LED) lamps in the principal avenues and cities of the country; synchronization of traffic lights to streamline traffic.

4. Schemes or mechanisms to finance energy efficiency efforts

With the financial assistance of the Inter-American Development Bank, technical cooperation is approved in the total amount of US$400,000 (75 percent from IDB, 25 percent from the Dominican Government). The Executing Agency is CNE.

This IDB technical cooperation will finance the contracting of (a) consulting firm(s) recognized in the energy sector and in accordance with Terms of Reference approved by the Bank, as well as with the hiring policies that govern the SECCI (Sustainable Energy and Climate Change Initiative) fund.

5. Fiscal, economic or tariff incentives

Under the framework of the draft Energy Efficiency Law cited in 1), CNE is analyzing the following mechanisms:

- Public finance programs
- Tax incentives
- Reduction in import tariffs
- Exchange of old equipment for new ones/discount options
- Establishment of efficient loans with banks

6. Market for efficient equipment

The Action Plan cited in 3) is working on the preparation of regulations, in coordination with the General Bureau of Regulations and Quality System of the Dominican Republic *(Dirección General de Normas y Sistema de Calidad de RD, DIGENOR)* (www.digenor.gov.do]) for the development of:

a) A regulation for the labeling of self-ballasted compact fluorescent lamps;
b) A regulation for the method to test self-ballasted compact fluorescent lamps;
c) A regulation for the efficiency of electric motors.

7. Access to energy[23]

Article 138 of Law 125-01 creates the Dominican Corporation of State Electricity Companies *(Corporación Dominicana de Empresas Eléctricas Estatales, CDEEE)* and assigns it the duty of carrying out State programs for rural and suburban electrification that aid low-income communities. Paragraph II of Article 138 creates the Rural and Suburban Electrification Unit *(Unidad de Electrificación Rural y Suburbana, UERS)* (www.uers.gov.do), which is regulated by a Presidential Decree.

The Corporation is conducting the "Strategic Plan for Territorial Electrification" ("*Plan Estratégico de Electrificación Territorial")*, which promotes the launching and expansion of conventional electricity network systems, micro-hydroelectric plants *(micro centrales hidroeléctricas, MCH)*, photovoltaic solar panels, and the Lightbulb Replacement Program *(Programa de Sustitución de Bombillas, PSB)*, under which approximately 10 million bulbs were exchanged.

[23] Source: presentation by Julián Despradel of CNE at the workshop "Access to Energy and Poverty Reduction to Achieve Millennium Objectives in Latin America and the Caribbean," CEPAL, Santiago de Chile, October 2009.

Rural Electrification Program based on Renewable Energy Sources ***(Programa de Electrificación Rural basado en Fuentes Renovables de Energía, PERenovables)***

Five-year period/budget €5 million; 57 rural communities (benefiting a population of 150,000); 34 micro-hydroelectric plants (5 kW–150 kW); a wind-energy generation system (50 kW); a system for the integrated use of renewable energy sources (biofuels and solar energy) in 4 communities; creation of community cooperatives; creation of a National Association of Cooperatives.

ECUADOR

1. Existing regulations

Under Executive Decree No. 1681, signed by the President of the Republic and by the Minister of Electricity and Renewable Energy, all government institutions must form an Energy Efficiency Committee that will be in charge of implementing energy-saving measures, in coordination with the Bureau of Energy Efficiency (of the Ministry of Electricity and Renewable Energy, MEER) (www.meer.gov.ec).

The Resolution is included in the consideration by the Political Constitution of Ecuador which stipulates in its Article No. 413 that "the State shall promote energy efficiency, the development and use of environmentally clean and friendly practices and technologies…" In addition, Article No. 414 stipulates that "the State shall adopt adequate, cross-cutting measures for the mitigation of climate change, through the limitation of greenhouse gas emissions…"

The Executive Decree became effective in May 2009, whereby a 12-month deadline was established for compliance with all provisions.

An Energy Efficiency Development Law is currently being studied, according to information on the website of the Ministry of Electricity and Renewable Energy of Ecuador.

2. Institution responsible for energy efficiency

In 2007 the Ministry of Energy and Mines of Ecuador was divided into two Ministries: the Ministry of Mines and Petroleum (now the Ministry of Non-Renewable Natural Resources) and the Ministry of Electricity and Renewable Energy. Since then, the latter, through its Under-Secretariat of Renewable Energy and Energy Efficiency, is responsible for developing and monitoring energy efficiency projects in Ecuador.

The Ministry of Electricity and Renewable Energy was created by Executive Decree Nº 475 dated July 23, 2007. In its Article 6, the Decree stated that "the current Under-Secretariat of Electrification and the Bureau of Renewable Energy, which were part of the Ministry of Energy and Mines, will become direct agencies of the Ministry of Electricity and Renewable Energy."

3. Organization and definition of national programs: programs under execution

"Energy-Saving Lightbulbs" Project: The project for the mass replacement of six million incandescent lightbulbs with energy-saving bulbs, promoted by the Ecuadoran Government and the Ministry of Electricity and Renewable Energy, became a reality with the arrival of six million energy-saving bulbs which are being delivered for free, nationwide, in order to reduce residential electricity consumption for lighting, which represents 24 percent of total consumption.

Energy Efficiency Program in Public Buildings: The Ministry of Electricity and Renewable Energy, through the Under-Secretariat of Renewable Energy and Energy Efficiency, is promoting energy savings in public buildings. This project is being carried out with the participation of the College of Electrical and Electronic Engineers of Pichincha (CIEEPI) (www.cieepi.ec). The project was launched in March 2009 in the Office of the President of the Republic. The basic objective was to analyze indexes of energy consumption in buildings and identify savings opportunities for a subsequent implementation of systems with low energy consumption.

About 50 public sector institutions are participating in the program and have formed an Energy Management Committee to coordinate ongoing training efforts for the purpose of turning staff into energy

efficiency promotion agents. Public sector workers also receive technical and professional assistance from CIEEPI to achieve efficient use of energy.

The institutions that improve their energy efficiency indicators are awarded a Certificate of Excellence and receive an energy efficiency manual with the guidelines and procedures to be followed for sustained, responsible use of the nation's energy and of the natural resources used to generate it.

4. Support to ESCOs

In the presentation of Ecuador's 2008–2020 Energy Policies, one of the policies mentioned is to promote the creation and consolidation of energy services companies. At present, ESCONSULT Ecuador is an energy services company that operates in accordance with the definition of ESCOs in Ecuador.

5. Schemes or mechanisms to finance energy efficiency efforts

The projects that are being developed by the Under-Secretariat of Renewable Energy and Energy Efficiency, under the Ministry of Electricity and Renewable Energy, receive funds from said Ministry's regular budget. The Inter-American Development Bank (IDB) is financing, with grant resources, the Sustainable Energy Action Plan (*Plan de Acción de Energía Sostenible,* PAES) which supports energy efficiency, renewable energy and biofuel initiatives.

Through the Power and Communications Sectors Modernization and Rural Services Project (PROMEC), the World Bank issued a loan for US$23 million and grants for US$2.84 million to implement a project aimed at promoting energy efficiency and electrification in rural sectors of Ecuador.

6. Fiscal, economic or tariff incentives

The application of this type of incentives to energy efficiency projects, under the framework of a future law to promote the efficient use of energy, is currently being studied.

7. Market for efficient equipment

The Ecuadoran National Institute of Standardization *(Instituto Nacional Ecuatoriano de Normalización, INEN)* approved the Standard for Energy Efficiency in Buildings, which was developed by MEER. The document stipulates the conditions with which a building must comply in order to optimize its energy consumption.

Other equipment and elements of the market for efficient equipment include CFLs and refrigerators.

8. Equipment labeling

There is a technical regulation for high-efficiency lamps (RTE-INEN 036): "Energy efficiency. Compact fluorescent lamps. Ranges of energy performance and labeling."

This Ecuadoran Technical Regulation stipulates the minimum energy efficiency and the features of informational labeling with regard to the energy efficiency of compact fluorescent lamps (modular construction) for use with electronic or electromagnetic ballasts, and of compact fluorescent lamps (integrated construction) for use with electronic ballasts. It also specifies the content of energy consumption labels to prevent risks to safety, health, the environment and practices that may lead to error by electricity consumers.

9. Access to energy

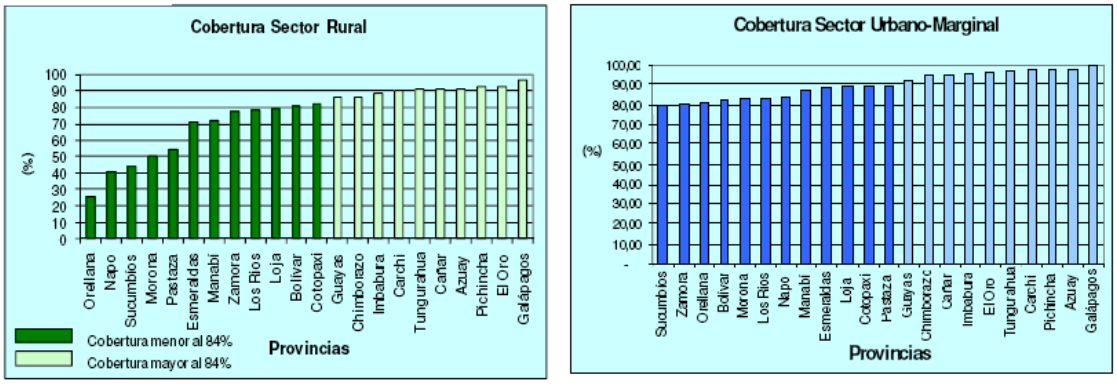
The Ministry of Electricity and Renewable Energy, together with the National Electrification Council *(Consejo Nacional de Electrificación, CONELEC)* (www.conelec.gov.ec), manages the Program for Energy in Rural Areas and Electrification in Disadvantaged Urban Areas (*Programa de Energización Rural y Electrificación Urbano Marginal, FERUM)*, which is being carried out in the country's municipalities with the objective of providing electricity service to areas distant from the national interconnected system (for more information on the program and its level of progress, see: http://sisgesi.conelec.gov.ec/ferum/).

FERUM's general objective is to expand national electricity coverage, with emphasis on the development of disadvantaged rural and urban areas through the provision of electrical energy.

Since its creation, FERUM has increased total electricity coverage in rural areas by 6 percent. According to 2001 census and housing statistics, electrification reached 79 percent in rural areas and 91.5 percent in the urban sector; national coverage totals 89 percent.

Estimated coverage for 2009 is: 85.7 percent rural sector, 92.7 percent urban sector, and 90.4 percent national coverage.

Coverage in the rural sector and in the disadvantaged urban sector



Source: CONELEC

Rural electrification programs (through renewable energy sources): Euro-Solar Program

The Euro-Solar Program stems from a regional agreement signed in December 2006 by the European Union (EU) and eight Latin American countries (four in Central America and four in South America), including Ecuador.

Its objective is to contribute toward improving living conditions in the areas of health, education and telecommunications in 91 rural communities in Ecuador through access to a source of renewable electrical energy strictly for community use.

It provides a technology kit to each community, composed of:

- An 1,100 Wp photovoltaic system
- Access to Internet and IP telephony through a V-SAT satellite connection
- Lighting of community facilities
- Computer equipment (5 portable computers, 1 multi-function device, 1 projector)

- Refrigerator for medicines
- Water purifier
- Battery charger

Progress of activities:

- Identification of regions and beneficiary communities (finalized)
- Installation and start-up of infrastructure that will house computer and health equipment (finalized and in the process of work liquidation)
- Provision and installation of technology kits for the implementation of educational, cultural, productive/social, and communication services, and applications in the area of health (contracted and execution initiated by the European Union)
- Program implementation, conduction of training, and process of monitoring and evaluation (actions initiated by the EU and MEER for this objective)

The Program has received €4,360,000 in financing, with a contribution of €3,450,000 from the EU and €910,000 from the national counterpart. The Program's duration is 48 months (42 months for the operational phase and 6 months for closing) in accordance with the financial agreement.

- Starting date: 1-18-2007
- Closing date: 9-18-2011
- Percentage of progress: 43%

Source: presentation on progress of the Euro-Solar Program, Quito, September 2009.

EL SALVADOR

1. Existing regulations

In August 2007, the Legislative Assembly of El Salvador issued Legislative Decree Nº 404, concerning the Law for the Creation of the National Energy Council (*Consejo Nacional de Energía, CNE)*. CNE, presided by the Head of the Ministry of Economy (*Ministerio de Economía, MINEC)*, "shall be the leading, guiding and regulatory authority in matters of policy and strategy that promote the efficient development of the energy sector".

The purpose of creating the council is to establish strategic policies that promote the efficient development of the energy sector, ensuring that citizens will be provided with services that are essential to the community, and encouraging the proper use and rational consumption of energy sources.

For this reason, CNE will work on designing guidelines for the comprehensive development of a National Energy Policy. The objective of this effort is to develop a policy that promotes the rational use of energy, the optimization of infrastructure, the increase in rural electricity coverage, and regional integration.

2. Institution responsible for energy efficiency

The institution responsible for carrying out the policy for efficient use of energy in El Salvador is the National Energy Council, as cited in paragraph 1).

OLADE is developing the institutional framework for energy efficiency, with the PALCEE Project, financed by the Austrian Development Cooperation agency.

3. Organization and definition of national programs: programs under execution

El Salvador's Ministry of Economy *(Ministerio de Economía, MINEC)*, through the Electrical Energy Bureau (*Dirección de Energía Eléctrica, DEE)*, in coordination with the National Energy Council (*Consejo Nacional de Energía, CNE)*, through Technical Cooperation No. ATN/OC-11265-ES, is executing the Energy Efficiency Program whose objective is to design, evaluate and implement a series of energy efficiency (EE) measures, including pilot projects, identify necessary information, and prepare proposals for potential loans to implement EE measures in addition to pilot projects. The project's overall objective is to improve socioeconomic and environmental conditions in El Salvador, as well as to contribute to improving the competitiveness of productive sectors that consume energy.

4. Schemes or mechanisms to finance energy efficiency efforts

The Energy Efficiency Program, which is under development, has the financial support of the Inter-American Development Bank (IDB). IDB's contribution totals US$670,000 and the local contribution is US$170,000. A two-year period of execution is expected.

Likewise, the World Bank, through its "Programmatic Study on the Energy Sector of the Central American Region," is exploring available options for the implementation of energy efficiency measures in countries of said region.

5. Fiscal, economic or tariff incentives

The Energy Efficiency Program, under development with IDB, contains Component III: "Sources of financing for the procurement of energy-efficient equipment and systems," in which mechanisms for the creation of incentives of this nature, applicable to energy efficiency projects and/or programs, will be studied.

6. Market for efficient equipment

Legal status of standardization in El Salvador: Law of the National Council for Science and Technology (*Consejo Nacional de Ciencia y Tecnología, CONACYT)*, approved in accordance with Legislative Decree Nº 287 of July 1992, which creates the National Council for Science and Technology, the government agency that deals with issues related to standardization. The regulations on energy efficiency use those of Mexico as a reference.

There are two mandatory regulations on energy efficiency: two-pin base fluorescent lamps (requirements for energy performance and labeling) and electrical components of efficient high-intensity discharge (HID) lamps for operation in lamps for public lighting (requirements for energy performance and labeling).

7. Equipment labeling

Energy-consuming equipment currently with labeling in El Salvador includes:

- Compact fluorescent lamps
- Lamps for public lighting
- Alternating current motors
- T-8 tube fluorescent lamps

8. Access to energy

With a total of approximately 88.4 percent of Salvadoran households having access to electrification,[24] El Salvador has the second-highest index of electrification in Central America, after Costa Rica. Of the 163,000 families that lack access to electricity, 120,000 live in rural areas.

The Salvadoran Government, through the "Social Investment Fund for Local Development" *("Fondo de Inversión Social para el Desarrollo Local," FISDL)*, is increasing electricity coverage in rural areas.

El Salvador has launched FOMILENIO, a mega-development project in the northern part of the country. FOMILENIO started up with the energy project that will increase electricity coverage to 97 percent in the next three years, benefiting over 30,000 families in the 94 municipalities integrated in the region.

The work, which will construct 1,385 km of energy distribution lines in order to connect them to existing networks, will have a cost of US$33 million. In terms of consumption, this represents a consumption of 15 MWh, with an estimated average consumption of 75 kWh by consumers. The design of El Salvador's rural electrification program included non-reimbursable resources from IDB totaling US$750,000 through the ATN/JF-7918-ES Project "Development of a Sustainable National Market for Rural Energy Services," which constructed a series of sustainable projects using solar panels.

[24] Source: Ministry of Economy of El Salvador, September 2009.

GRENADA

1. Regulations and institutions responsible for energy efficiency

Grenada has no specific regulations on the subject on energy efficiency.

Ministry of Finance, Planning, Economy, Energy and Cooperatives, through GRENLEC–Grenada Electricity Services Ltd. (www.grenlec.com).

Its current effective role with regard to the promotion and development of energy efficiency is very limited. The Government of Grenada proposes the creation of an Energy Efficiency Unit within the Energy Division of the Ministry in charge of energy.

OLADE is developing the institutional framework for energy efficiency with the PALCEE Project financed by the Austrian Development Cooperation agency.

2. Organization and definition of national programs: programs under execution

Incandescent lightbulb replacement program

In 2007, Grenada, as part of Cuba's International Cooperation Program implemented in several Caribbean countries (all of these beneficiaries are members of PETROCARIBE), replaced 133,200 incandescent lightbulbs with energy-saving lamps.

The results show the following indicators:

- Incandescent bulbs effectively replaced: 133,253.
- Reduction in the country's maximum demand by 1,891 kW; in energy terms, this would represent 10,150 MWh/year.
- The economic benefits from savings in generation capacity are around US$2,270,000; from fuel savings, 23,440 tons of imported fuel per year would equal US$1,182,700. This represents an annual total of US$3,452,700 in 2007.
- In environmental terms, the replacement allows a reduction in CO_2 emissions of about 6,690 tons per year, valued at about US$28,100 in 2007.

3. Schemes or mechanisms to finance energy efficiency efforts

The program to replace incandescent lightbulbs with compact fluorescent lamps was financed with resources from the PETROCARIBE Program, aimed at paying for Cuba's technical assistance and for the purchase of low-consumption lamps.

4. Market for efficient equipment

In order to promote the development of a market for efficient equipment, the Government of Grenada proposes to:

- Develop and execute an energy efficiency program in the public sector.
- Create energy efficiency standards for mechanical ventilation, air conditioning, lighting, water heating devices and systems within institutions, commerce and industry. These standards will be

applied to the design of buildings and well as to internal equipment. Separate standards will be used for houses.

- Issue mandates to regulate controls on vehicles in order to ensure a greater level of energy efficiency.
- Create a labeling system for equipment with reference to their level of energy efficiency.
- Comply with efficiency conditions for the importation of certain vehicles.

5. Access to energy

GRENLEC is the company in charge of generating, transporting and distributing electrical energy in Grenada. Since 2005, it has been steadily increasing the number of customers with access to electricity: a) in the residential sector, from 29,119 customers in 2005 to 37,256 at the end of 2009 (+28 percent); b) in the commercial sector, from 4,250 to 5,636 (+32.6 percent); c) in the industrial sector, from 33 to 36 (+9 percent).

GUATEMALA

1. Institution responsible for energy efficiency

Guatemala currently has no regulations specifically aimed at promoting energy efficiency.

The entity responsible for this subject is the Energy Efficiency Unit of the National Electrical Energy Commission (*Comisión Nacional de Energía Eléctrica, CNEE)* (www.cnee.gob.gt), under the authority of Guatemala's Ministry of Energy and Mines (*Ministerio de Energía y Minas, MEM)* (www.mem.gob.gt).

2. Organization and definition of national programs: programs under execution

The technical cooperation with the Inter-American Development Bank (IDB) includes four components:

- Component 1: Design of the Energy Efficiency Incentives Program.
- Component 2: Definition and Financial Schemes of the Comprehensive Energy Efficiency Plan (*Plan Integral de Eficiencia Energética, PIEE).*
- Component 3: Institutional strengthening of MEM/CNEE and training of specialists.
- Component 4: Creation of the National Technical Agency for Energy Efficiency *(Órgano Técnico Nacional de Eficiencia Energética).*

Other aspects of the cooperation:

a) Campaign to disseminate, publicize and raise awareness about energy efficiency.
b) Establishment of pilot projects in municipalities, the residential sector, industry, transportation and firewood.
c) Institutional strengthening of MEM/CNEE and training.

3. Support to ESCOs

An ESCO-type mechanism is under way for energy efficiency projects in municipal public lighting.

4. Schemes or mechanisms to finance energy efficiency efforts

Based on the project that is receiving IDB cooperation, cited in paragraph 2), a component will be developed to define schemes to finance the Comprehensive Energy Efficiency Plan *(Plan Integral de Eficiencia Energética, PIEE)*.

Likewise, the World Bank, through its "Programmatic Study on the Energy Sector of the Central American Region," is exploring available options for the implementation of energy efficiency measures in countries of said region.

5. Market for efficient equipment

The Guatemalan Standards Commission (*Comisión Guatemalteca de Normas, COGUANOR)* deals with technical standards that contribute to improving the competitiveness of Guatemalan national companies and increasing the quality of products and services. A government initiative aims to establish, in support of COGUANOR, a package of technical standards for energy efficiency.

The current market for efficient equipment refers to compact fluorescent lamps, which are steadily replacing incandescent lightbulbs.

6. Access to energy

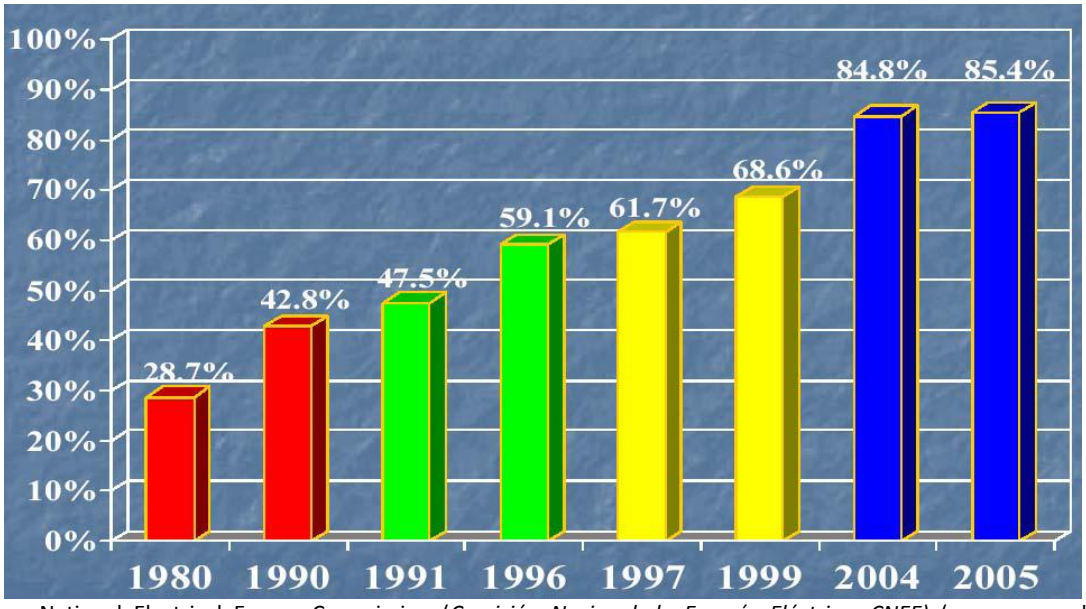
In Guatemala, MEM and the National Institute for Electrification *(Instituto Nacional de Electrificación, INDE)* are the institutional agencies responsible for programs to expand electricity coverage.

The country's electricity coverage increased from 59.1 percent in 1996 to 85.4 percent in 2005, that is, at a rate of 4.3 percent per year. In 1998, with a significant portion of funds from the privatization of electricity distributors and from the Government, an Electrification Trust Fund was established for US$333.6 million, of which 45 percent was allocated to transmission works and 55 percent to rural distribution and electrification.

The target specified in the Trust Fund was the connection of 280,000 new users in 2,633 communities, benefiting around 1.7 million inhabitants, all located in communities and villages in the interior of the country, in all cases outside the boundary of mandatory service provision, in accordance with the Electricity Industry Law *(Ley de la Industria Eléctrica)*.

Currently, 8 of the 21 departments have electrification indexes below 50 percent, 7 between 50 percent and 80 percent, 4 between 80 percent and 90 percent and 2 with electrification indexes over 90 percent.

Evolution of electricity coverage in Guatemala to 2005



Source: National Electrical Energy Commission (*Comisión Nacional de Energía Eléctrica, CNEE)* (www.cnee.gob.gt); Guatemalan National Institute of Statistics (*Instituto Nacional de Estadísticas de Guatemala*, INE) (www.ine.gob.gt).

The Trust Fund was established in the amount of US$333.6 million, of which US$182.7 million were allocated for rural distribution works and US$150.9 million for the transmission works required to support the growth in distribution networks. INDE has contributed US$209.4 million to the Trust Fund; it has US$40.1 million from a loan by the Central American Bank for Economic Integration (*Banco Centroamericano de Integración Económica, BCIE)* and US$55 million from an IDB loan (GU-L1018).

GUYANA

1. Institution responsible for energy efficiency

Guyana has no specific regulation in effect to promote the efficient use of energy.

The following institutions deal with the subject of energy efficiency:

Government agencies: Guyana Energy Agency (GEA) (www.gea.gov.gy). Programs to disseminate and raise public awareness about energy efficiency. Among its functions, the Division of Energy and Energy Statistics develops energy conservation programs.

Companies: Guyana Power and Light Inc. (GPL) (www.gplinc.com), the electricity company, promotes programs to raise awareness about the efficient and rational use of electricity.

2. Organization and definition of national programs: programs under execution

In 2009, GEA launched a campaign to promote energy efficiency. Four brochures were designed: transportation, lighting, appliances and design of buildings and houses; the lighting system in the GEA's own building was modernized.

GPL is considering the implementation of a prepaid electricity metering system and is conducting campaigns to raise awareness about the efficient use of energy.

3. Schemes or mechanisms to finance energy efficiency efforts

Energy efficiency efforts have the financial support of the Government and the Inter-American Development Bank (IDB), the latter for rural electrification projects.

GEA estimates that, to conduct a nationwide energy efficiency program, around US$100,000 will be needed.

Three institutions are currently handling funds: the Office of the Prime Minister (OPM) (www.gina.gov.gy), Guyana Power and Light Inc., and the Guyana Energy Agency.

The programs are monitored by the Office of the Prime Minister, through the Ministry of Finance, which oversees disbursements.

4. Market for efficient equipment

Under development, beginning with the replacement of lightbulbs.

5. Access to energy

It is estimated that the electricity system in Guyana provides service to only 60 percent of the total population, far below the level achieved by many of the country's regional peers. Around 20 percent of Guyana's population lives in the country's interior.

For the areas not served, an Unserved Areas Electrification Programme (UAEP) is financed by a loan from the IDB.

OLADE Rural Electrification Project for Paraguay, Guatemala, Bolivia and Guyana

In the Wowetta Community, an indigenous population located in Region 9, Upper Takatu-Upper Essequibo, with 49 families, a program is being carried out with emphasis on productive aspects and with the following components:

- Community store
- Initiatives by women and adolescents
- Participation by an NGO for financial sustainability

Five projects defined by the population:

- Carpentry shop (support with tools)
- Community garden–water pumping (FV).
- Household lighting system (FV)
- Community store–freezer (FV)–Cassava processing unit
- Diesel generator and mill

HAITI

1. Institution responsible for energy efficiency

Haiti has no legislation or regulation that supports the efficient use of energy, nor is it known whether any draft legislation is being studied in this regard.

The energy stakeholder is the Ministry of Public Works, Transportation and Communications (*Ministère des Travaux Publics, Transport et Communications, MTPTC)* but it is not involved in energy efficiency issues. The Bureau of Mines and Energy *(Bureau des Mines et de l'Energie)*, which acts as the coordinator of initiatives and international support on energy issues, is the other relevant actor in the sector.

2. Organization and definition of national programs: programs under execution

In 2007, Haiti, as part of Cuba's International Cooperation Program in countries that are members of PETROCARIBE, replaced about 2,400,000 incandescent lightbulbs with energy-saving lamps.

The results were as follows:

- Incandescent lightbulbs effectively replaced: 2,366,768.
- An 18 kWh monthly reduction in energy consumption per household.
- An 86.3 MW reduction in the country's peak demand; in energy terms this would represent 334,186 MWh/year.
- The economic benefits from savings in generation capacity will be around US$100 million; from fuel savings, 110,000 tons of imported fuel per year, valued at US$48 million. This comes to an annual total of US$148 million in 2007.
- In environmental terms, the replacement enabled a reduction in CO_2 emissions of about 220,000 tons per year, valued at about US$925,000.

3. Schemes or mechanisms to finance energy efficiency efforts

In 2008, the Inter-American Development Bank (IDB) approved a US$12.5 million grant to Haiti to support the rehabilitation of the Peligre hydroelectric plant and improve the reliability of energy supply to the capital, Port-au-Prince.

For the program's preparation, studies were conducted with resources from the IDB's Infrastructure Fund (InfraFund) and the Sustainable Energy and Climate Change Initiative (SECCI). The latter is also financing an energy efficiency plan for Haiti and the preparation of proposals on biofuels and other renewable sources.

The Ministry of Public Works and EDH are responsible for the program, whose execution will take five years.

Resources from PETROCARIBE are also available.

4. Market for efficient equipment

The market for efficient equipment refers only to low-consumption lamps (installed in accordance with the program cited in 2).

5. Access to energy

Electricity coverage in Haiti is the lowest in the Latin American and Caribbean Region: less than 40 percent in 2006.

Nearly six million people lack access to the electrical grid. Most of these people are located in isolated areas where the situation is even more critical. More than 67 percent of the rural population lacks access to electrical energy. This lack of access, besides accentuating poverty conditions in rural areas, often acts as a barrier that keeps families from improving their situation. Focusing on rural areas, the technical assistance program, entitled the Bio-Energy Action Plan, cofinanced by the IDB and the Organization of American States (OAS) through a Grant Cofinancing Contribution (COFAB), seeks to promote the development of biomass and biofuels for use in transportation and electricity generation, as an alternative in: the diversification of the energy grid, the reduction in external dependence on fuel supply, the increase in demand for agricultural products, and employment generation in rural areas. In turn, it hopes to understand the potential of industry in Haiti and the mechanism to access, through industry, carbon credits and opportunities stemming from the Kyoto Protocol.

For now, the principal barriers that hinder expansion of the use of renewable energies as a viable option for rural areas in Haiti are: the scarcity of appropriate technology, the absence of adequate financial mechanisms, the incipient development of rural areas and the lack of decentralized models for the management of basic services. Added to these circumstances are the unfortunate consequences of the January 2010 earthquake, which had a very negative influence on the development of Haiti's infrastructure. To mitigate the damages caused by this event in terms of electrical infrastructure, the IDB expanded financing from US$18 million to US$32 million, from a previous loan for the Rehabilitation of the Port-au-Prince Electricity Distribution Network, in order to: (i) re-establish the coverage and quality of electricity service in the metropolitan area; (ii) reduce technical and commercial losses of electricity in the system; and (iii) expand the bases for the technical, administrative and financial re-establishment of Haiti's electricity company, Électricité d'Haïti (EDH) in the short, medium and long terms. In turn, the IDB financed, through a US$1 million investment grant, added to a US$500,000 GEF project coordinated with the World Bank, the provision of solar electricity generators and solar refrigerators to refrigerate vaccines in emergency centers and camps during the reconstruction stage.

With a contribution of approximately US$6 million in grants, the World Bank is seeking to support the Government of Haiti in reducing losses from the national electricity system. This project will enable the installation of an efficient administrative and technical service system and the improvement of service quality.

As part of the Clean Development Mechanism Study in low-income countries, the World Bank financed the training of local consultants in Haiti to prepare several energy efficiency projects. One of these projects seeks to replace nearly 2.6 million incandescent lightbulbs with compact fluorescent lamps.

HONDURAS

1. Existing regulations

The Government of Honduras, in its Executive Decree dated May 6, 2006, Article 1, stated that "the rational use of energy is of national interest, and its application is considered a national priority." Draft Law for the Rational Use of Energy: now in the process of approval in the National Congress. The Law creates, within the Secretariat of Natural Resources and Environment *(Secretaría de Recursos Naturales y Ambiente)*, the Institute for the Rational Use of Energy (*Instituto para el Uso Racional de la Energía, IURE)*, hereafter referred to as "the Institute," which will be managed by a Management Board presided by the Secretary of State in the Offices of Natural Resources and Environment and composed of the Director-General of Energy and a representative of the Secretariat of Industry and Commerce, the Honduran Council on Private Enterprise, the National Electrical Energy Company and the Autonomous National University of Honduras.

2. Institution responsible for energy efficiency

Since 2007, the subject of the rational use of energy in Honduras has been under the responsibility of GIURE (Inter-institutional Group for the Rational Use of Energy *[Grupo Interinstitucional para el Uso Racional de la Energía]*). It is composed of the Secretariat of Natural Resources and Environment (*Secretaría de Recursos Naturales y Ambiente*, *SERNA)* which has a Department for the Rational Use of Energy, the National Electrical Energy Company (*Empresa Nacional de Energía Eléctrica*, *ENEE)*, the Autonomous National University of Honduras, the Secretariat of Education, the Energy Efficiency Commission of the College of Mechanical, Electrical and Chemical Engineers of Honduras, and the Honduran Council on Private Enterprise (*Consejo Hondureño de la Empresa Privada, COHEP)*.

3. Organization and definition of national programs: programs under execution

Autonomous Generation and Rational Use of Electrical Energy Project (*Proyecto Generación Autónoma y Uso Racional de la Energía Eléctrica, GAUREE)*, of ENEE: aimed at promoting the rational use of electrical energy.

GAUREE II Project: this module is carrying out concrete actions to improve the load curve (management of demand) and optimize the Rational Use of Electrical Energy (*Uso Racional de Energía Eléctrica, UREE)*.

Project for the Implementation of Compact Fluorescent Lamps in the Residential Sector (*Proyecto Implementación de Lámparas Fluorescentes Compactas en el Sector Residencial*): six million units of CFLs were delivered, making it possible to replace bulbs in a short period of time among ENEE's residential subscribers.

National Campaign "Learning about the Rational Use of Electrical Energy" *("Aprendiendo el Uso Racional de la Energía Eléctrica," AURE)*. This training campaign is conducted in the national educational system; elementary and secondary students from at least 250 schools carry out activities that involve measures to save electrical energy in their homes.

Project for Energy Efficiency in the Industrial and Commercial Sectors (*Proyecto de Eficiencia Energética en los Sectores Industrial y Comercial, PESIC).* This project is in charge of promoting energy efficiency in the abovementioned sectors and creating a trust fund for investment in the private sector. It is executed by the Honduran Business Council for Sustainable Development (*Consejo Empresarial Hondureño para el Desarrollo Sostenible, CEHDES)*, with supervision by the United Nations Development Programme (UNDP) and a multisectoral committee that includes State representatives such as *SERNA),* the Technical Secretariat for Cooperation (*Secretaría Técnica de Cooperación, SETCO)*, and donor institutions such as the Global Environment Facility (GEF) and the Canadian International Development Agency (CIDA).

Energy Efficiency and Biofuel Programs, financed by the ATN/SF-10719-HO technical cooperation of the Inter-American Development Bank (IDB), which, under its energy efficiency component, is providing assistance in the design, evaluation and implementation of energy efficiency measures, including pilot projects and the preparation of energy efficiency investment plans.

The Energy Efficiency Project *(Proyecto de Eficiencia Energética, PROMEF)*, financed by the World Bank, has the objective of strengthening the distribution network, reducing losses and increasing cost recovery by the state electricity company (*Empresa Nacional de Energía Eléctrica de Honduras*, *ENEE)*.

4. Schemes or mechanisms to finance energy efficiency efforts

Support for energy efficiency initiatives and projects in Honduras comes from State budget resources, ENEE funds and international cooperation, depending on the project in question. In addition, under the framework of the PESIC Project, one of the projects under way is the Financial Mechanism (FOPESIC).

Likewise, the World Bank, through its "Programmatic Study on the Energy Sector of the Central American Region," is exploring available options for the implementation of energy efficiency measures in countries of said region.

5. Equipment labeling

Energy efficiency standards are under the direction of the Honduran Standardization Agency (*Organismo Hondureño de Normalización, OHN)* and involve the Government and the private sector. The aim is to create a standard for compact fluorescent lamps which will become effective beginning in 2010 and will be aimed at restricting the importation, manufacture and marketing of incandescent lightbulbs. In the future, standards will be developed for electric motors, refrigerators and appliances.

6. Access to energy

Electricity coverage is 69 percent. In rural areas it is only 45 percent, in contrast to 94 percent coverage in urban areas. The following table shows access data by number of households and consumers.

	Population	%	Nº households	%	Nº customers	%	Access rate (%)
Urban	3,350,081	45.5%	700,507	49.0%	661,582	66.9%	94.4%
Rural	4,016,940	54.5%	729,611	51.0%	327,114	33.1%	44.8%
TOTAL	7,367,021	100%	1,430,118	100%	988,696	100%	69.1%

Source: World Bank 2007

Electrification was planned under the 1994 Framework Law for the Electricity Subsector, through the creation of the Social Fund for Electricity Development (*Fondo Social de Desarrollo Eléctrico, FOSODE)*. The Government has made it an objective to increase national electricity coverage to 80 percent by 2015, assigning the same priority to urban and rural areas. To date, the result has been positive, with national coverage increasing from 43 percent in 1994 to 69 percent in 2006.

By 2015, it is expected that 400,000 new connections will be made. However, the lack of financing has delayed the network's development, making it lag behind demand.

JAMAICA

1. Institution responsible for energy efficiency

Currently, Jamaica has no specific regulations regarding the promotion of energy efficiency (EE); these initiatives are included in the "2008–2011 Energy Conservation and Efficiency Policy" (draft).

The Ministry of Energy and Mines (www.men.gov.jm) is the entity responsible for initiatives to promote energy efficiency in Jamaica.

PCJ, the Petroleum Company of Jamaica, has an Energy Efficiency Unit (see 2).

OLADE is developing the institutional framework for energy efficiency, with the Energy Efficiency Program for Latin America and the Caribbean (PALCEE) Project financed by the Austrian Development Cooperation agency.

2. Organization and definition of national programs: programs under execution

In an effort to consolidate and support the work of the Government of Jamaica (GOJ) in matters of energy efficiency, PCJ established the National Energy Efficiency Unit (NEEU) in 2003. Its broad mandate calls for the development and coordination of the Government's EE program and facilitates private investment in sources of renewable energy. NEEU focuses its efforts on four key programs: (i) Residential Program; (ii) Program for Small Businesses; (iii) Program for Industrial and Commercial Users; and (iv) Program for the Public Sector and Government.

Other initiatives in the public sector include: a) carrying out energy audits and implementation of ESCOs; b) energy efficiency in hospitals: retrofitting of water chillers; c) a project to replace four million inefficient lamps; and d) projects for efficiency in police stations, in the National Water Commission and in schools.

3. Schemes or mechanisms to finance energy efficiency efforts

Energy Fund (proposed for the private sector)

PCJ's National Energy Efficiency Unit has been promoting a public awareness and education program, as well as facilitating the establishment of an Energy Efficiency Fund. It is hoped that this fund (still under discussion) can offer special financing to users and private sector operators, at low interest rates.

In June 2009, the Inter-American Development Bank (IDB) approved a non-reimbursable technical cooperation operation aimed at supporting the GOJ in the development of energy efficiency projects and assisting it technically in the preparation of a loan for this purpose. The amount of this cooperation is US$350,000, added to which is the local counterpart contribution of US$87,000. The executing agency is the Ministry of Energy and Mines of Jamaica.

In addition, the Inter-American Investment Corporation (IIC) launched the GREENPYME Program in March 2009. This program promotes the adoption of energy efficiency measures, the use of renewable energy and clean technologies for small and medium enterprises *(pequeñas y medianas empresas, PyMEs)* in Latin America and the Caribbean.

PETROCARIBE of Venezuela and a bilateral agreement with Cuba are two additional technical cooperation initiatives for Jamaica with regard to the efficient use of energy.

4. Fiscal, economic or tariff incentives

For the private sector, there are initiatives for tariff (Customs Duty Waiver) and fiscal incentives such as General Consumption Tax (GCT) exemptions.

5. Market for efficient equipment

The Jamaica Bureau of Standards (JBS) introduced a mandatory label for refrigerators in 1990. In practice, this label, similar to that used in the United States, is generally not applied and consumers are unaware of its meaning.

6. Equipment labeling

JBS is currently involved in two key areas of energy efficiency:

- Application and labeling tests
- Overhaul and promotion of the Energy-Efficient Building Code (EEBC).

A Solar Energy Laboratory was established in the mid-1980s, stemming from a USAID/GOJ project, which implied the participation of a large number of GOJ agencies to improve the country's capacity for developing energy efficiency and renewable energy projects. The laboratory is able to evaluate the operation of most components, including collectors and storage tanks associated with solar water heaters. After its launch, JBS undertook a random testing program for water heaters from local manufacturers or distributors, and made subsequent recommendations.

The EEBC in Jamaica was implemented by JBS as a professional code in Jamaica in 1994.

7. Access to energy

Under the framework of the Rural Electrification Program, 7,000 km of low-tension distribution lines were installed and approximately 70,000 rural households were electrified. Approximately 90 percent of households on the entire island have access to electricity.

The prices of electricity now reflect their real cost. However, the Government's policy continues to offer a minimum lifeline, which benefits consumers who use less than 100 kWh per month. This cross-subsidy is provided by consumers who use more than 101 kWh per month.

MEXICO

1. Existing regulations

Since November 2008, the date of the publication of the Law for the Sustainable Use of Energy, the National Commission for the Efficient Use of Energy (*Comisión Nacional para el Uso Eficiente de la Energía, CONUEE)* was formed. This law stated that all human and material resources of the National Commission for Energy Saving (*Comisión Nacional para el Ahorro de Energía, CONAE)* will be understood as being allocated to this new commission. The new law gave a mandate for the preparation of the National Program for the Sustainable Use of Energy (*Programa Nacional para el Aprovechamiento Sustentable de la Energía, PRONASE;* see 3) which was published in November 2009.

CONUEE, in accordance with this law's publication, is constituted as a decentralized administrative agency of the Secretariat of Energy, with technical and operational autonomy. Its objective is to promote energy efficiency and become a technical agency dealing with the sustainable use of energy.

In addition, within the same package of reforms, the Law for the Use of Renewable Energy and the Financing of the Energy Transition was also published, under the framework of the National Strategy for the Energy Transition and the Sustainable Use of Energy, under which the Mexican Government will promote:

- Energy efficiency and sustainability (in the context of financing for the Energy Transition)
- The reduction in dependence on hydrocarbons as a primary source of energy.

See http://www.energia.gob.mx/webSener/res/0/Fideicomiso_2145.pdf

2. Institution responsible for energy efficiency

National Commission for the Efficient Use of Energy *(Comisión Nacional para el Uso Eficiente de la Energía, CONUEE)* (www.conuee.gob.mx).

CONUEE is the body designated by the Federal Government to promote energy efficiency and constitutes a technical body on the issue of sustainable use of energy.

Secretariat of Energy of the Government of Mexico (*Secretaría de Energía del Gobierno de México, SENER)* (www.sener.gob.mx).

SENER's mission is to conduct the country's energy policy, under the current constitutional framework, in order to ensure the competitive, sufficient, high-quality, economically viable and environmentally sustainable supply of types of energy required for the development of the nation's life.

Trust Fund for Electricity Saving (*Fideicomiso para el Ahorro de Energía Eléctrica, FIDE)* (www.fide.org.mx).

FIDE is a private, nonprofit institution with mixed participation, whose mission is to promote and encourage through actions and results the efficient use of electricity, by developing programs and projects that link technological innovation and demand to produce a natural market for efficient technologies.

It is intended that FIDE develop a comprehensive culture of saving and efficient use of electricity in Mexican society through dissemination, awareness and education at all levels, offering programs and projects of high quality and innovation, and generating economic, social and environmental benefits for the country.

3. Organization and definition of national programs: programs under execution[25]

PRONASE: National Program for the Sustainable Use of Energy 2009–2012 ***(Programa Nacional para el Aprovechamiento Sustentable de la Energía 2009–2012)***

This program defines a comprehensive strategy to address and capture impact through actions identified in the end-consumption of energy, assigning priority to measures that concentrate the bulk of potential impact. In 2008, end-consumption of energy represented 56 percent of national energy consumption. Ninety percent of this consumption was concentrated in the transportation, industrial, residential and commercial sectors.

The program identifies seven areas of cost-effective opportunities for increasing energy efficiency and reducing energy consumption in the medium and long term.

1. Transportation: addresses energy consumption in both light- and medium-weight automotive transportation, as well as heavy cargo.
2. Lighting: includes lighting needs throughout the residential, commercial, service and industrial sectors, as well as within Federal Public Administration agencies and within state and local governments.
3. Household and building equipment: refers to energy consumption stemming from the use of electric appliances, electronic devices and higher energy-consumption equipment in households, including air conditioning, refrigeration, ventilation and water heating.
4. Co-generation: identifies the possibility for energy saving in industries with a latent co-generation potential.
5. Construction: addresses opportunities for energy saving stemming from improvements in construction practices.
6. Industrial motors: deals with energy consumption in three-phase engines (less than 75 HP), because these represent the large majority of motors and their consumption in the country.
7. Water pumps: includes energy consumption for purposes of agricultural and municipal pumping.

Stemming from the analysis of objectives and strategies of the seven areas of opportunity and the identified leverages of energy efficiency, 26 courses of action were defined for inclusion in the program, which are contained in the following areas:

1. Guidelines for the public sector (guidelines for the adoption of efficient technologies, information programs and dissemination of best practices, among others).
2. Programs focused on end-users of energy (such as regulation and support to disadvantaged groups).
3. Skills development in the subject of energy efficiency (for example: conduction of promotional campaigns, professional development.

FIDE Programs

FIDE has implemented diverse programs. Some of the most important are:

a) Savings and Efficient Use of Electricity Programs. FIDE has concentrated its efforts on four main areas—industrial, trade, services and municipal services—in which it has conducted more than 4,000 energy efficiency demonstration projects in all production branches in Mexico.

[25] Due to space limitations, only the two most important ones are cited.

b) Program to Finance Electric Energy Savings (PFAEE). This program was developed from 2002 to 2006, under which 778,550 equipment replacement actions were carried out (80 percent refrigerators, 17 percent air conditioners, 3 percent thermal insulation applications).
c) Efficient Lighting Program. This program includes promoting the replacement of conventional lamps with compact fluorescent lightbulbs (CFLs) nationwide. As of October 2010, 12,367,687 lightbulbs were replaced in programs directly supported by FIDE.
d) Program to Support the Tortilla and Masa Industry ("My Tortilla"). The program was created to modernize the tortilla sector, replacing obsolete machinery and equipment and saving electricity and gas. By September 30, 2010, the program had already begun, and the first four pieces of equipment were installed.
e) Equipment Replacement Program to Save Electricity in Households. The Federal Government program, known as "Exchange Your Old One for a New One," has been operated by FIDE since 2009. It has achieved significant results in power savings and emission reductions, and has shown a significant benefit to the economies of thousands of Mexican families.

4. Schemes or mechanisms to finance energy efficiency efforts

All energy efficiency programs currently under way in Mexico are financed by the respective operational budgets of the public and private entities and organizations mentioned in 2).

FIDE also received technical and economic assistance from the Inter-American Development Bank (IDB) for the execution of the Energy Efficiency in Mexico Project (ME-0204) in operations between 1997 and 2005. IDB granted a loan of US$23,400,000 and the local counterpart contributed an equal amount. The project's objective was to develop the market for energy-efficient equipment (3ϕ motors, compressors, T8 efficient linear lamps). IDB also financed the design of PRONASE with resources from the ATN/OC-11716-ME technical cooperation.

The World Bank, through the large-scale energy efficiency project in the residential sector (appliances and lighting), will finance the replacement of 45.6 million incandescent lightbulbs with compact fluorescent lamps (CFLs) and the replacement of 1.7 million refrigerators and air conditioners. The technical assistance component will also enable the institutional strengthening and financing of the activities scheduled under PRONASE. This is the first project of its kind in that it combines the use of various sources of financing in a single initiative, with resources from climate investment funds (CTF), the Global Environment Facility (GEF) and the World Bank.

The MEDEC study (Low-Carbon Development for Mexico), financed by the World Bank, will allow Mexico to explore its potential for low-carbon-intensity energy options.

5. Fiscal, economic or tariff incentives

The Federal Government, through the Secretariat of Energy (SENER), in order to implement the National Agreement on Behalf of Family Economy and Employment, signed by the President on January 7, 2009, has developed the Program to Replace Electrical Appliances for Electrical Energy Saving *(Programa de Sustitución de Equipos Electrodomésticos para el Ahorro de Energía Eléctrica)*.

In this program, SENER is the policy maker and is empowered to answer questions about the operation guidelines and their implementation, while FIDE was designated as the program's operator.

The program provides direct support and funding for Mexican families to replace their refrigerators and air conditioners (i.e., equipment that is over ten years old) with new, more efficient appliances. (http://www.energia.gob.mx/webSener/pse/index.html).

a) A free voucher that partially covers the price of the appliance and transportation costs, storage and destruction associated with the replacement of the equipment.
b) Supplementary funding to cover the price of the appliance, and if so, the costs associated with replacing it. This support consists of a credit at a preferential rate for a period of four years, which will be charged through the electricity bill. In no case will the beneficiary be obliged to use the financial support.

6. Market for efficient equipment

The Federal Government, through the Secretariat of Energy, has implemented the Program to Replace Electrical Appliances for Electrical Energy Saving, whose aim is to replace refrigerators or air conditioning equipment that has been used for ten or more years, with new, more efficient devices in terms of energy consumption. In December 2009, the Federal Government announced that this program will undergo modifications in order to benefit a larger number of Mexican families. In this regard, the amount of financial support was increased, maximum electricity consumption limits were eliminated, and the capacity of equipment that can be purchased under the program was increased. The program will be receiving financial support from the World Bank to ensure its continuity based on its successful implementation.

As of October 2010, the Program to Replace Electrical Appliances for Electrical Energy Saving ("Exchange your Old One for a New One") had benefited over 756,924 families in Mexico.

7. Equipment labeling

In Mexico, a voluntary label s used to identify the most efficient equipments in the market; this label is the FIDE Seal.

The FIDE Seal aims to:

- Easily identify best electricity-saving products in the market
- Encourage consumers to purchase products that excel at saving energy.
- Recognize companies for their technical and financial effort to produce efficient equipment.
- Foster the competitiveness of domestic industries with regard to international competition.
- Encourage the use of energy-efficient products in programs promoted by the FIDE.

It is important to note that the FIDE Seal is awarded to products that are checked through technical documentation and test reports issued by accredited laboratories (national or foreign), establishing that the products are outstanding in terms of the efficient use of energy, or their properties or attributes help reduce the consumption of energy.

List of equipment with FIDE Seal
http://fide.codice.com/home/interior.asp?cve_sub=24#fragment-6

Mandatory Mexican Regulations (*Normas Oficiales Mexicanas*, NOM) of CONUEE
http://www.conae.gob.mx/wb/CONAE/CONA_1002_nom_publicadas_vigen

Program to Promote Process, Products and Services Certification
http://www.conuee.gob.mx/wb/CONAE/0_programa

One of its objectives is to establish guidelines, terms and mechanisms for obtaining a distinctive recognition for products and new residential buildings, non-residential buildings and industrial plants.

In addition, it has published the catalogue of equipment and devices in which producers, importers, distributors and marketers should include information on energy consumption (http://www.conuee.gob.mx/work/images/catalogo.pdf).

8. Access to energy

In terms of the coverage of electrical energy coverage in the 2001–2009 period,[26] nearly 6,800 rural villages and slightly more than 4,000 popular *colonias* (neighborhoods) were electrified, benefiting over two million inhabitants.

Comparative progress: in 2009, 107.5 million inhabitants with electricity service compared to 99.7 million in 2001 (+7.8%); service coverage: in 2009, 97.3%; in 2001, 87.5% (+11.2%). Urban population with electricity coverage: in 2009, 98.4%; in 2001, 98.8% (-0.4%). Rural population with electricity coverage: 2in 009, 91.0%; in 2001, 83.0% (+9.6%).

The missing percentage represents between three and four million people, primarily living in rural villages scattered throughout the country's geography in communities with only a few homes, mostly in states of southeastern Mexico (Oaxaca, Chiapas, Guerrero and Veracruz, where the average percentage of electrification is less than 90 percent). A significant percentage of people without access to electricity belong to indigenous communities. With regard to projects for rural areas, there is an operation with the GEF and the World Bank aimed at increasing access to electricity through generation using renewable sources of energy and through the extension of distribution networks. This project is called Integrated Energy Services and the implementing agency is SENER.

For the partial financing of the project, the World Bank lent US$15 million plus US$15 million in GEF grants, which will increase access to efficient and sustainable energy services in rural, predominantly indigenous, communities.

CFE's 2008 Annual Report (the latest available on its website) presents "rural electrification" statistics: http://app.cfe.gob.mx/informe 2008/capitulo7_2.html.

[26] Source: Population: INEGI; *Cobertura y población con acceso a energía eléctrica*: Government Reports and Reports on the Work of the Secretariat of Energy of Mexico *(Secretaría de Energía de México, SENER)*.

NICARAGUA

1. Existing regulations

- Electricity Industry Law No. 272, which stipulates policy guidelines to promote the saving and efficient use of energy (Article 2, Section 5).

- Decree 1304-2004, "Establishment of the National Energy Policy," published in the Official Daily Gazette *(Gaceta Diario Oficial)* in March 2004.

2. Institution responsible for energy efficiency

The official agency that deals with the subject of energy efficiency is the Ministry of Energy and Mines (*Ministerio de Energía y Minas, MEM)* (www.mem.gob.ni) of the Government of Nicaragua, through the Department of Energy Efficiency.

It promotes energy audits and demonstration projects in the industrial and commercial sectors, advises the general sector composed of government facilities, hospitals and schools on decreasing electricity consumption through improvements to lighting and air conditioning, and assists in the selection of electricity tariffs that are adequate for working operations, defining regulations that encourage the introduction of energy-efficient electrical equipment in the country.

It promotes training, guidance and information campaigns for all sectors, especially the residential sector, and encourages the labeling system for electrical appliances and energy-consuming equipment that allows the end-user to understand the energy efficiency of equipment purchases.

It is the executing agency of Nicaragua's Energy Efficiency Program with the Inter-American Development Bank.

OLADE is developing the institutional framework for energy efficiency, with the PALCEE Project financed by the Austrian Development Cooperation agency.

3. Organization and definition of national programs: programs under execution

Under the framework of the Technical Cooperation of the Japan Special Fund (JSF), an Inter-American Development Bank (IDB) donor (see below), the following actions are being conducted:

- Preparation of 30 Energy Audits in the industrial, commercial and service sectors
- Efficient lighting for the general sector (government, hospitals and schools), public lighting and support for the implementation of pilot projects. 20 Energy Audits
- Feasibility of a trust fund for the procurement of energy-efficient equipment and systems
- Updating of prior studies on the Description of the Demand Curve and end-use of energy in the City of Managua
- Preparation of loan proposals for project financing
- Expansion and optimization of the current Program of Education on Energy Efficiency in the Residential Sector

In addition, MEM, with its own resources and the collaboration of other public institutions, has been carrying out the following activities that deal with energy efficiency:

a) Definition of a Public Lighting Program;
b) Definition of a Fuel-Saving Program for the Transportation Sector;
c) Studies related to the strengthening of energy efficiency in the country, such as the definition of elements for a baseline, project financing and strategies.

4. Schemes or mechanisms to finance energy efficiency efforts

Nicaragua recently approved its National Program for Sustainable Electrification and Renewable Energy *(Programa Nacional de Electrificación Sostenible y Energía Renovable, PNESER)*, which will provide up to US$381 million in loans and technical cooperation to transform Nicaragua's electricity sector, including energy efficiency and access. Its design was coordinated with IDB, with the participation of the World Bank, the International Finance Corporation, the Spanish Agency for International Development Cooperation, the Korean Eximbank, the Latin American Investment Facility, the European Investment Bank, the Central American Bank for Economic Integration, the Climate Investment Fund, and the Nordic Investment Fund. An initial concessionary loan of US$30.5 million to support PNESER was approved by IDB on July 7.

In addition to PNESER and technical cooperation with the support of Japanese Special Fund (JSF) grant resources cited in 3), Nicaragua is carrying out other energy efficiency efforts with financing from the Global Environment Facility (GEF), with implementation through the United Nations Development Programme (UNDP) and BUN-CA (www.bun-ca.org) (Energy Efficiency in the Industrial and Commercial Sectors).

With regard to the technical cooperation operation with the IDB, the amount of nongovernmental contributions (from JSF) is US$726,350.00. The total amount to be spent for technical cooperation is US$916,350.00, 20 percent of which must be contributed by the local counterpart, i.e., MEM of Nicaragua (US$190,000).

Likewise, the World Bank, through its "Programmatic Study on the Energy Sector of the Central American Region," is exploring available options for the implementation of energy efficiency measures in countries of said region.

5. Fiscal, economic or tariff incentives

The Government of Nicaragua recognizes the importance of establishing this type of incentives to foster the development of energy efficiency initiatives. This intention was explained in Decree 13-2004, Art. 5, VII. "On energy efficiency", clause 3: Promote incentives that foster the importation of energy-efficient electrical equipment.

In turn, a Draft Law for the Promotion of Energy Efficiency is under preparation (as of June 2009). This Draft Law considers tax incentives such as a reduction in the Value Added Tax *(Impuesto al Valor Agregado, IVA)* and access to project financing.

The Draft Law for the Promotion of Energy Efficiency is under discussion.

6. Market for efficient equipment

With regard to the Regulation of Energy Efficiency for Electrical Equipment, in accordance with Presidential Decree 2-2008 "Regulation for Energy Use," Article 5, the Ministry of Development, Industry and Commerce *(Ministerio de Fomento, Industria y Comercio, MIFIC)* is authorized to publish and put into practice the Mandatory Nicaraguan Technical Regulations *(Normas Técnicas Obligatorias Nicaragüenses, NTON)*, referring to the importation of electrical equipment that consumes more energy.

In its preamble, said Decree authorized the Ministry of Energy and Mines *(Ministerio de Energía y Minas, MEM)* to coordinate and put into effect regulations, resolutions and administrative provisions for the use of energy in a rational and efficient manner with the support of other State institutions.

The following Mandatory Nicaraguan Technical Regulations on Energy Efficiency are currently becoming effective:

- Self-ballasted compact fluorescent lamps;
- Incandescent and similar types of lamps for household use;
- Household refrigerators and freezers;
- Alternating current three-phase induction engines, squirrel-cage rotor type, with nominal power ranging from 0.746 to 373 kW.

7. Equipment labeling

Currently, in accordance with the NTON Regulation, only household refrigerators are labeled.

8. Access to energy

The reform of the electricity industry (in 1998) called for the creation of the National Electricity Industry Development Fund (*Fondo para el Desarrollo de la Industria Eléctrica Nacional, FONDIEN)*, designed to support electrification in rural and disadvantaged areas. The country's electricity coverage in rural areas increased from 47.8 percent in 1995 to 55 percent in 2006, that is, less than 1 percent per year.

National Program for Sustainable Electrification and Renewable Energy (*Programa Nacional de Electrificación Sostenible y Energía Renovable*, PNESER)

With regard to access, PNESER expects to increase electricity coverage from 65 percent to 85 percent in the space of four years, thus benefiting 1.7 million inhabitants.

Rural Electrification Program in Isolated Areas (*Programa de Electrificación Rural en Zonas Aisladas,* PERZA)

The Ministry of Energy and Mines and the World Bank have been implementing this program since 2003. It includes rural electrification, mainly using solar energy and micro-hydroelectric plants. PERZA includes pilot projects that contemplate sustainable mechanisms for the installation of a variety of decentralized energy systems based on renewable energy technologies for the electrification of areas outside the grid. The projects have been located in coordination with the National Development Plan established by the Government of Nicaragua. The project promotes the participation of the private sector in Nicaragua's rural electrification, and is supported by schemes that promote the supply of photovoltaic applications in areas distant from the electrical grid.

PERZA's total investment is US$19 million, of which US$12 million correspond to a World Bank loan, US$4 million are a GEF grant and US$3 million are counterpart contributions. PERZA has two components:

a) Rural electrification and renewable energy policies (cost: US$1 million), with the objective of establishing a legal and regulatory framework for the sustainability, transparency and efficiency of rural electrification projects under the National Electricity Industry Development Fund (*Fondo de Desarrollo de la Industria Eléctrica Nacional*, FONDIEN).

b) Rural electrification (cost: US$17 million). Phase 1 included populations of Jinotega, *the North Atlantic Autonomous Region (Región Autónoma Atlántico Norte, RAAN)*, and the South Atlantic Autonomous Region *(Región Autónoma Atlántico Sur, RAAS*), with photovoltaic battery charging centers *(centros de carga de batería fotovoltáicos, CCBFV)* and mini-hydroelectric plants. Phase II considered the inclusion of microfinance and business development services components when carrying out projects, as well as the collaboration of productive uses of small-scale hydroelectricity (PCH), under another project executed by MEM and financed by UNDP/GEF.

As of mid-2007, seven CCBFV had been installed for 300 homes.

PANAMA

1. Existing regulations

The Legal and Regulatory Framework of the Program for the Rational and Efficient Use of Energy *(Programa de Uso Racional y Eficiente de la Energía, UREE)* has been under preparation since March 2010 and is expected to be ready by November.

2. Institution responsible for energy efficiency

The National Secretariat of Energy *(Secretaría Nacional de Energía, SNE)*, assigned to the Ministry of the Presidency and created by Law 52 of 2008, is the entity that has taken over the functions of the Energy Policy Commission *(Comisión de Política Energética, COPE*). It operated in the area of the Ministry of Economy and Finance and was mandated by the law of February 1997, whose Article 16 indicates the duties and functions inherited from COPE; subsections 1 and 9 refer to the subject of the efficient use of energy:

- Study and analyze national policy options on the subjects of electricity, hydrocarbons, rational use of energy, and integrated use of the country's natural resources and all of its energy sources, in accordance with general development plans;
- Establish programs for energy saving and rational use of energy.

3. Organization and definition of national programs: programs under execution

Plan for Energy Saving in the Public Sector

Under Executive Decree N° 758 of October 2009, a Program for Electrical Energy Saving in the Public Sector was implemented.

An Energy Administrator was appointed in each government institution, with a total of 74, to act as a liaison for the execution and monitoring of the Energy Saving Program. From November 2009 to February 2010, there have been US$4,500,000 in savings in electricity consumption. Taking into account the fact that State institutions save 10 percent of electricity consumption with the implementation of this program, these efforts represent savings of US$1 million per month and nearly 5.4 GWh in energy.

Changes in public office hours from 8:00 a.m. to 4:30 p.m., to 7:30 a.m. to 3:30 p.m. This measure avoids traffic congestion and promotes fuel savings. This program includes electricity savings in public offices; air conditioners are turned on half an hour after offices open (8:00 a.m.) and are turned off half an hour before offices close (3:00 p.m.) Adjustment of air conditioner thermostats so that the room temperature is 23°C. Each degree (centigrade) of adjustment represents five percent of the energy consumption of air conditioning.

"Support for the Program of Sustainable Energy and Energy Efficiency, and Strengthening of the National Energy Secretariat *(Secretaría Nacional de Energía, SNE)* of Panama"

For the purpose of complying with the energy policy stipulated in Law 52 of 2008, with financing from the Inter-American Development Bank (IDB) ATN/MC-11323-PN grant, in the amount of US$750,000, the project to promote the development of the energy sector is being carried out.

Program for the Rational and Efficient Use of Energy *(Programa de Uso Racional y Eficiente de la Energía, UREE)*

Since March 2010, work is being done on a Legal and Regulatory Framework of the Program for the Rational and Efficient use of Energy *(Programa de Uso Racional y Eficiente de la Energía, UREE)*, the Energy Education Plan *(Plan Educativo Energético*), the Energy Dissemination Plan *(Plan de Difusión Energético)*, labeling of electrical appliances and other equipment, the building construction code, the evaluation of the Metro and its feeder routes in the public transportation sector, the design of financing schemes, the simulation of the pilot project, and the creation of a Certification Program *("Diplomado")* in Energy Resources Administration, in conjunction with the Technological University.

Institutional strengthening of the National Secretariat of Energy

As part of the same effort, the Design of the Strategic and Organization Basis of the Secretariat was obtained, using the definition of the legal and regulatory framework of Law No. 52 which creates the SNE and its regulation.

Creation of a training program for energy efficiency technicians

In conjunction with the National Institute for Human Development *(Instituto Nacional de Desarrollo Humano, INADEH)*, SNE is participating in designing the curriculum and training plan for energy efficiency technicians.

4. Schemes or mechanisms to finance energy efficiency efforts

Based on IDB technical cooperation, the design of schemes to finance energy efficiency programs is envisaged.

Likewise, the World Bank, through its "Programmatic Study on the Energy Sector of the Central American Region," is exploring available options for the implementation of energy efficiency measures in countries of said region.

5. Market for efficient equipment

The Secretariat of Energy is developing a program with minimum efficiency standards for residential appliances and commercial, electrical, common-use or mass-consumption equipment (new).

The program will indicate the minimum electrical efficiency values that manufacturers should meet when manufacturing their product. These values are applied to products manufactured inside the country and to all products imported into the country.

In its different phases, it will cover at least the following products and equipment:

- Residential products: fluorescent and incandescent lamps and bulbs. Ballasts for fluorescent lamps. Refrigerators and freezers. Central air conditioners. Room air conditioners. Small-duct and high-velocity air conditioners. Washing machines. Clothes dryers. Ceiling fans with or without lamps. Water heaters.

- Commercial equipment: Air conditioning units. Refrigeration equipment. High-intensity discharge lamps. Washing machines. Small motors. Electric motors. Water heaters.

6. Equipment labeling

As part of the same work cited in 5), it is expected that by November there will be a labeling system to guide the rational and efficient use of energy in electrical appliances and other equipment, and a building construction code, under the framework of the Program for the Rational and Efficient Use of Energy *(Programa de Uso Racional y Eficiente de la Energía, UREE)* (see 3).

7. Access to energy

The Panamanian Cabinet approved US$7 million for rural electrification projects. These programs will benefit more than 25,000 people in 100 communities.

IDB approved a US$30 million credit for Panama to finance rural electrification.

The program, through public and private investment, will promote the delivery of service to 30,000 rural families, thereby increasing rural electricity coverage by 10 percent; in 2005 the percentage was 57.6.

Electricity coverage in Panama totals 87.8 percent.

Evolution of rural electricity coverage in Panama. Source: Rural Electrification Plan 2003–2013 (COPE/MEF)

PARAGUAY

1. Institution responsible for energy efficiency

Currently, there is no specific regulation in effect to promote the efficient use of energy in Paraguay. What exists, at a design level, is a component of the future National Plan for the Efficient Use of Energy, entitled "Legal and Regulatory Framework".

The institution in charge of promoting the efficient use of energy in Paraguay is the Vice Ministry of Mines and Energy *(Viceministerio de Minas y Energía, VMME)* (http://www.ssme.gov.py). It is an agency of the Executive Authority of the Government of Paraguay. A National Energy Efficiency Committee has been formed, under the coordination of the Vice Minister.

2. Organization and definition of national programs: programs under execution

The electricity company ANDE (www.ande.gov.py) has a project for the rational use of energy, with financial support from the Inter-American Development Bank; the project is currently at the stage of hiring consultants. The project calls for the study and preparation of a program of measures to be adopted for the rational use of electrical energy, including: a) physical aspects of the distribution system, b) control and reduction of electricity losses, c) characteristics of consumers, with an evaluation of energy saving, and d) efficient use of electricity.

At national level, VMME is carrying out the National Plan for the Efficient Use of Energy, with the following components: Diagnostic, Planning, Institutional, Legal and Regulatory, Human Resources, Financial and Logistical, Environmental and Social, Implementation, Control and Monitoring, Feedback. A National Energy Efficiency Committee has been formed. Its tasks are to: a) create a Promotion and Dissemination Campaign; b) identify existing projects and programs; c) analyze and identify sources of project financing; d) analyze the implementation of fiscal, financial and taxation measures; e) establish energy efficiency criteria (standardization and labeling of products, replacement of sources, etc.); and f) prepare the Plan for the Efficient Use of Energy, addressing all of its aspects.

The Efficiency Committee is working on several projects, linking various sectoral institutions.

- Plan for the replacement of incandescent lightbulbs with high-efficiency lamps. VMME, ANDE and OLADE. Project completed.
- Revision of ANDE's rate schedule. Application of differential tariffs for low voltage and other measures.
- Communication campaign for proper use of energy.

3. Schemes or mechanisms to finance energy efficiency efforts

Currently being studied, as mentioned in item 3, paragraph two, National Energy Efficiency Plan, "Analyze and identify sources of project financing."

4. Fiscal, economic or tariff incentives

Currently being studied, as mentioned in item 3), paragraph two, National Energy Efficiency Plan, "d) Analyze the implementation of fiscal, financial and taxation measures."

5. Access to energy

Electricity coverage in Paraguay's urban areas is around 97 percent and in rural areas 87 to 88 percent (Source: SIEE-OLADE).

Pilot project conducted under the framework of cooperation with OLADE, in La Patria Community, an indigenous population located in the Chaco, with 250 families, where firewood, kerosene and candles are currently used.

- Components of the project currently under development
    - Productive use of carob beans *(algarroba)*: flour – baking (includes radio communication system and diesel generator);
    - Multipurpose center for commerce, training and social events (use of SFV);
    - 122 improved stoves.

Key activities conducted:

- Workshops with the community to identify projects;
- Establishment of a community enterprise and a sustainability scheme for fund administration by an NGO;
- Construction of infrastructure to process carob beans: collection centers, flour processing, baking.

In the 2008–2013 Strategic Plan (Ministry of Public Works and Communications, www.mopc.gov.py, which deals with energy issues), there are no projects to expand access to energy.

PERU

1. Existing regulations

Peru has the following regulations on energy efficiency: a) Law 27.345, Promotion of the Efficient Use of Energy (September 2000); b) Regulation of Law 27.345, Supreme Decree No. 053-2007-EM (October 2007).

Measures for energy saving in the public sector: Supreme Decree No. 034-2008-EM (June 2008). Linear fluorescent lamps (40 W) (Model T12) should be replaced with 36 W (Model T8) lamps, and incandescent lightbulbs should be replaced with compact fluorescent lamps (according to equivalency).

Energy consumption indicators and their monitoring methodology, R.M. No. 038-2009-MEM/DM (January 2009), were approved in order to establish energy consumption indicators disaggregated by sectors.

2. Institution responsible for energy efficiency

The General Directorate of Electricity *(Dirección General de Electricidad, DGE)*, belonging to the Vice Ministry of Energy, under the Ministry of Energy and Mines of the Government of Peru (www.minem.gob.pe), is the institution responsible for promoting energy efficiency activities in the country.

3. Organization and definition of national programs: programs under execution

Plan of Reference for the Efficient Use of Energy 2009–2018. Mission under the scope of energy efficiency: to promote the implementation of energy efficiency efforts in all sectors of consumption through best practices and the use of efficient technology.

In September 2008, DGE brought together the 25 regional governments at a coordination workshop (Regional Governments: Plan of Reference for the Efficient Use of Energy 2009–2018) with the objective of endorsing the approval of said Plan of Reference (PREE).

Enacted by R.M. No. 469-2009-MEM/DM (October 2009). Mission: to promote the implementation of energy efficiency efforts in all sectors of consumption through best practices and the use of efficient technology, improve competitiveness and contribute to the country's sustainable development.

4. Support to ESCOs

In June 2009, the National Environmental Fund of Peru *(Fondo Nacional del Ambiente del Perú)* (www.fonamperu.org) organized an international course and workshop on entrepreneurial and business aspects of energy service companies in Peru.

An ongoing operation with the Inter-American Development Bank (IDB) is Technical Cooperation Grant Agreement No. ATN/ME-10711-PE, "Promotion of Market Opportunities for Clean Energy and Energy Efficiency in Peru." Its objective is to promote business opportunities and improve the competitiveness of PyMEs, among other aspects, with the intention of fostering the consolidation of a market for energy service companies. Under the framework of this project, a registry of ESCO-type companies and consulting firms has been prepared, available at: www.fonamperu.org/general/energia/documentos/directorio2.pdf.

5. Schemes or mechanisms to finance energy efficiency efforts

In 2008, the State allocated approximately US$2.8 million to the campaign for promotion of the efficient use of energy in the residential, public and productive sectors. In 2009, US$3.3 million had been earmarked.

Likewise, in 2008 Banco BBVA, belonging to Peru's private banking system, at the request of the IFC–World Bank, channeled US$30 million in loans to productive sector companies for energy efficiency projects through the "leasing" modality, a fund that was exhausted that same year, for which it was considered a successful experience. Other local banks have been managing funds for Clean Production, which includes energy efficiency projects.

In August 2008, an energy efficiency campaign for small and medium businesses, financed by IDB (cited in point 4 above), was launched. The executing agency is the National Environmental Fund (*Fondo Nacional del Medio Ambiente, FONAM)* and has US$1.5 million available for three years.

For the purpose of financing energy efficiency programs in the productive sector, the Development Finance Corporation *(Corporación Financiera de Desarrollo, COFIDE)* is coordinating a loan from RWE Bank (Germany) for €50 million, currently in final negotiations.

Moreover, in 2009 a specific project was implemented to replace 200,000 kerosene stoves with gas stoves, and 25,000 traditional firewood stoves with improved stoves. The project has an approved budget of US$15 million.

It has been estimated that the implementation of the Plan of Reference for Energy Efficiency will require a minimum initial annual budget of US$3 million. This amount is only for the promotion and stimulation of the energy efficiency market in all sectors, whereby the stakeholders themselves make the investments, since the energy efficiency efforts that are carried out will be paid with the savings that are obtained.

6. Fiscal, economic or tariff incentives

The Plan of Reference for Energy Efficiency calls for the design of support mechanisms through incentives for energy efficiency projects.

7. Market for efficient equipment

In Peru, regulations dealing with the market for efficient equipment are continuously being generated. The Regulatory Technical Subcommittees of the Technical Committee for the Rational Use of Energy, belonging to the National Institute for the Defense of Competition and Protection of Intellectual Property *(Instituto Nacional de Defensa de la Competencia y de la Protección de la Propiedad Intelectual, INDECOPI)* (www.indecopi.org.pe), propose, prepare and submit Draft Peruvian Technical Regulations *(Normas Técnicas Peruanas, NTPs)* on the Efficient Use of Energy.

As of 2010 the following NTPs related to energy efficiency are in effect:

- Industrial Boilers: 4
- Electric Motors: 4
- Refrigeration: 4
- Lighting: 21
- Water Heaters: 6
- Solar Systems: 6
- Total: 45

Guidelines for minimum energy efficiency standards

Objective: to provide relevant information on the energy efficiency of energy-consuming equipment. For example, the minimum electricity consumption of a frost-free refrigerator with an upper freezer should be 255 kWh/year.

8. Equipment labeling

Guidelines for energy efficiency labeling

Coordination is under way with INDECOPI and PRODUCE (www.produce.gob.pe), the portal of the Ministry of Production, to develop the mandatory use of these energy efficiency tools in the country.

9. Access to energy

Prior to 1992, electricity coverage was as low as 45 percent. Peru currently has the lowest coverage index in South America, after Bolivia. As of 2009, 79 percent of the country's inhabitants had electricity. According to the Ministry of Energy and Mines, Peru will achieve nationwide electricity coverage of 94 percent in 2011. To achieve this objective in 2011, MEM will execute the new electrification program known as *"Luz para Todos"*.

Access to electricity in disadvantaged urban zones: *"Luz para Todos"* ("Light for All") Program

Under this program, MEM has US$36 million available to provide electricity to disadvantaged urban areas. The investment serves to cofinance the implementation of Emergency Decree Nº 116–2009, which promotes the provision of public electrification service in the country's disadvantaged urban areas. Companies can submit to the Ministry of Energy and Mines a request for financing payable in ten years, subject to the number of houses that they will electrify. The program's mechanism will allow the electrification coefficient in urban areas to increase by four percent, and in rural areas by ten percent.

In rural areas, 68 percent of the Peruvian population does not have electricity (based on the 2005 National Electrification Coefficient: 78 percent).

With regard to the expansion of access to energy for the rural sector, the objectives of the electricity sector in the medium and long terms are to:

1. Place Peru within Latin's top third in terms of electricity coverage in the medium term.
2. Train rural users of the electricity service in the productive use of electricity.
3. Prepare plans in coordination with regional and local governments, so that they are able to prepare and execute their own studies and works.
4. Conduct studies that enable the gradual development of non-conventional types of renewable energy (solar, geothermal and wind) and the updating of designs for rural electricity systems.
5. Coordinate financing with public and private agencies for the purpose of obtaining economic resources and favorable credits to finance project execution.
6. Optimize administrative management and achieve institutional strengthening through the adequate provision of resources.

The General Bureau of Electricity, under the Ministry of Energy and Mines, prepared a National Rural Electrification Plan *(Plan Nacional de Electrificación Rural, PNER)* for the 2009–2018 period. Visit http://dger.minem.gob.pe/archivos to view this fully developed Plan.

SAINTS KITTS AND NEVIS

1. Existing regulations

The Ministry of Public Works, Housing, Energy and Utilities (MPHEU) of the Federation of Saint Kitts and Nevis (SKN) is the entity responsible for energy issues in the islands. With financial support from the Organization of American States (OAS), the Federal Energy Department has been initially financed under the MPHEU. This department will be responsible for formalizing staffing requirements, equipment needs and skills development, as well as identifying sources of financing (within or outside the Federation) that will ensure the department's economic sustainability. The department is responsible for facilitating the dissemination of information and best practices to all sectors with the aim of energy sustainability. Despite this, due to its recent creation it has limited personnel and its activities and role within the Ministry are still being formally established. In addition, the Nevis Island Administration (NIA) operates under the protection of the SKN Government. NIA has a Ministry of Communications, Works, Post, Physical Planning, Natural Resources and Environment which coordinates energy-related activities for the Island of Nevis.

A strategic plan for sustainable energy was formally approved in 2002, promoted as part of the Global Sustainable Energy Islands Initiative (GSEII) initiative, which will be supported by the national energy policy. SKN has not formally accepted its energy policy but it is currently in draft and is under discussion.

2. Institutions responsible for energy efficiency

The institutions responsible for carrying out the policy for the efficient use of energy in Saint Kitts and Nevis are MPHEU and NIA.

3. Organization and definition of national programs: programs under execution

Incandescent lightbulb replacement program (2004–2007)

In 2007, Saint Kitts and Nevis, as part of Cuba's International Cooperation Program implemented in several Caribbean countries (all of these beneficiaries are members of PETROCARIBE), fully replaced incandescent lightbulbs with energy-saving lamps. Savings of US$4.2 million were estimated as a result of this Cuban initiative (according to OLADE data).

Low Carbon Communities for the Caribbean (LCCC) initiative (2010)

OAS organized the LCCC program with funds from the Caribbean Sustainable Energy Programme (CSEP), an initiative financed by the ACP-EU Energy Facility of the European Union, in conjunction with technical assistance from the National Renewable Energy Laboratory (NREL) of the United States Department of Energy (DOE), and support from the Caribbean Electric Utility Service Corporation (CARILEC). This project seeks to create public capacity in renewable energy and energy efficiency, in which public employees will receive training by DOE to conduct energy audits.

The Government has shown interest in issuing mandates and restructuring taxes to promote the adoption of energy efficiency measures.

Most activities and efforts have dealt with the development of renewable energy, i.e., two wind power project and one geothermal project, and bioenergy studies.

4. Equipment labeling

The responsible authority is the Bureau of Standards (BoS), which operates under the Ministry of Finance, Foreign Trade, Industry and Consumers, but interest in the energy labeling of equipment has not yet been established.

5. Access to energy

The level of electrification in Saint Kitts and Nevis is over 99 percent.

SAINT LUCIA

1. Existing regulations

Saint Lucia recently approved its national energy policy (June 2010), which will be followed by modifications to legislation, regulations, etc. to promote the use of renewable energy and energy efficiency measures, with a defined institutional and regulatory framework. In terms of energy efficiency, the national energy policy highlights the implementation of demand management programs, the creation of incentives that promote energy efficiency, mandatory energy audits for large-scale consumers, support for the creation of ESCOs, and focus on efficiency in construction and transportation, among other activities.

The Ministry of Planning, Development, Housing and Environment is in charge of administering activities dealing with energy, formulating and monitoring the national energy policy, strategy and plans.

2. Institution responsible for energy efficiency

There is no specific institution in charge of energy efficiency. This responsibility falls under the Ministry of Planning, Development, Housing and Environment.

3. Organization and definition of national programs: programs under execution

Energy Awareness Week (2004–present)

Since 2004, with the support of the GSEII program, Saint Lucia created and annually conducts the "Energy Awareness Week", seeking to raise awareness and educate the population on the rational and efficient use of energy.

Energy audits and training for the hotel industry (2004)

A series of training workshops were held for energy audits and energy management in the hotel sector.

Incandescent lightbulb replacement program (2004)

Under GSEII, the replacement of incandescent lightbulbs with energy-saving lamps was initiated.

Incandescent lightbulb replacement program (2005–2007)

Saint Lucia, as part of Cuba's International Cooperation Program implemented in several Caribbean countries (all of these beneficiaries are members of PETROCARIBE), fully replaced incandescent lightbulbs with energy-saving lamps.

Energy-Saving Lightbulb Project (2008–present)

As a follow-up to the bulb exchange programs, the Government is continuing efforts to replace lightbulbs, with the ultimate goal of prohibiting the importation of incandescent bulbs.

Low Carbon Communities for the Caribbean (LCCC) initiative (2010)

OAS organized the LCCC program with funds from the Caribbean Sustainable Energy Programme (CSEP), an initiative financed by the ACP-EU Energy Facility of the European Union, in conjunction with technical assistance from the National Renewable Energy Laboratory (NREL) of the United States Department of

Energy (DOE), and with support from the Caribbean Electric Utility Service Corporation (CARILEC). This project seeks to create public capacity in renewable energy and energy efficiency, in which public employees will receive training by DOE to conduct energy audits.

4. Equipment labeling

The responsible authority is the Saint Lucia Bureau of Standards (http://www.slbs.org.lc/), which is currently labeling and monitoring all imported electrical appliances.

The Government is very interested in, and has assigned priority to, the labeling of electrical appliances and the development of construction codes, as defined in the national energy policy.

5. Access to energy

The level of electrification in Saint Lucia is over 99 percent.

SAINT VINCENT AND THE GRENADINES

1. Existing regulations

In February 2009, Saint Vincent and the Grenadines became the first Eastern Caribbean country to approve, through proceedings in its Cabinet, the National Energy Policy aimed at ensuring the provision of clean, reliable and affordable energy to its population. The National Energy Action Plan was approved in April 2010. The creation of the Energy Unit (2008) under the Office of the Prime Minister the Ministry of National Security, as well as the Energy Conservation Fund (2008), are aimed at reducing dependence on imported energy resources through the establishment and implementation of policies and programs to promote energy conservation and efficiency in the end-use and development of local renewable energy. In 2008, the National Energy Committee was also established; it is composed of experts in different fields and is in charge of supervising and providing recommendations to the Prime Minister on energy issues.

2. Institution responsible for energy efficiency

The institution responsible for carrying out the policy for efficient use of energy in Saint Vincent and the Grenadines is the Energy Unit, as cited in 1).

3. Organization and definition of national programs: programs under execution

Incandescent lightbulb replacement program (2004–2007)

Saint Vincent and the Grenadines, as part of Cuba's International Cooperation Program implemented in several Caribbean countries (all of these beneficiaries are members of PETROCARIBE), fully replaced incandescent lightbulbs with energy-saving lamps. VINLEC[27] reported a 1 MW (4 percent) reduction in peak evening demand, thanks to this program.

Campaign for energy efficiency measures (2005)

VINLEC conducted a nationwide television campaign to promote energy conservation and efficiency.

Special Framework Assistance 2006 (2010)

This year the Government of Saint Vincent and the Grenadines (GoSVG), with financing from the European Commission, commissioned a study of energy efficiency in 75 public buildings to demonstrate the benefits of energy-saving technologies and practices and to provide public employees with information and increase their awareness of the rational use of energy.

Low Carbon Communities for the Caribbean (LCCC) initiative (2010)

OAS organized the LCCC program with funds from the Caribbean Sustainable Energy Programme (CSEP), an initiative financed by the ACP–EU Energy Facility of the European Union, in conjunction with technical assistance from the National Renewable Energy Laboratory (NREL) of the United States Department of Energy (DOE), and with support from the Caribbean Electric Utility Service Corporation (CARILEC). This project seeks to create public capacity in renewable energy and energy efficiency, in which public employees will receive training by DOE to conduct energy audits.

[27] VINLEC is the national electricity company, a state monopoly.

4. Schemes or mechanisms to finance energy efficiency efforts

The Energy Conservation Fund was granted the sum of EC$1 million for three years (2008–2010) to develop an Energy Conservation Program.

5. Fiscal, economic or tariff incentives

Tax on incandescent lightbulbs (2007)

The Government introduced a 10 percent tax on incandescent lightbulbs with the goal of phasing out their importation.

Elimination of taxes on solar heaters and photovoltaic solar panels

On a case-by-case basis, solar heaters and photovoltaic solar panels (including batteries and inverters) are exempt from import taxes. The impacts of this measure have not been evaluated. Data on the importation of equipment show a significant increase in imports, from fewer than 100 solar heaters imported per year to nearly 500 in subsequent years, although their use is limited. The importation of photovoltaic solar panels is less significant.

Tax on vehicles

An environmental tax is levied on vehicles built before year 2000. This tax is aimed at having a newer vehicular fleet, but it has not been effective in terms of improving efficiency in energy consumption in the transportation sector.

6. Equipment labeling

The responsible authority is the Bureau of Standards (BoS) which currently labels all imported electrical appliances with information (vendor, country, model, voltage, frequency, current, etc.), but this information is not specific with regard to their consumption.

The Government has expressed great interest in, and has assigned priority to, the labeling of electrical appliances and the development of building codes, to be coordinated and executed by the Energy Unit and BoS.

7. Access to energy

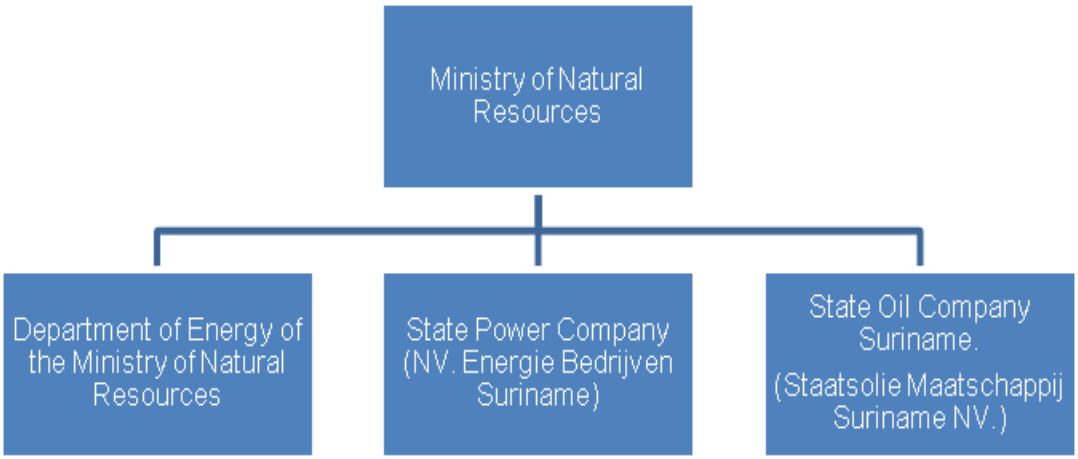
The level of electrification in Saint Vincent and the Grenadines is over 99 percent. Firewood is still used for cooking (low efficiency); this should be evaluated in greater detail and alternative services should be sought.

SURINAME

1. Institution responsible for energy efficiency

Currently, no specific regulation is in effect for the promotion of efficient energy use in Suriname.

Suriname has no official agency in charge of energy efficiency issues. The institutional scheme with respect to energy is as follows:



The three entities (two public enterprises and the Department of Energy under the authority of the Ministry of Natural Resources) have their own energy efficiency programs, which are approved by the Ministry.

2. Organization and definition of national programs: programs under execution

The lightbulb replacement program, through a donation from Cuba, reduced energy consumption in some residential areas by 10 percent. It did not ensure sustainability.

3. Schemes or mechanisms to finance energy efficiency efforts

Indirectly, under the framework of a Water Supply Infrastructure Rehabilitation Project with the financial support of the Inter-American Development Bank (IDB; SU-L1018), there is a component that refers to energy efficiency:

Component 2: As a result of several energy audits conducted with IDB financing through RG-T1605 “Energy Efficiency for Caribbean Water and Sanitation Companies”, this component will finance equipment upgrades and the implementation of energy-efficient measures that will make it possible to generate benefits and energy savings and recover expenses in the short term. The Executing Agency for Project SU-L1018 is the water company N.V. SWM.

4. Market for efficient equipment

There is only partial penetration of efficient lamps in the residential sector.

5. Access to energy

By 2008, it was estimated that 85 percent of the population would have access to electricity. Of this 85 percent, 79 percent is served by the state energy company N.V. Energiebedrijven (EBS) and the remaining 6 percent by the district-level electrification company DEV under the Ministry of Natural Resources.

The Ministry of Natural Resources, through the Department of District-level Electrification, is responsible for supplying electricity to rural villages in the country's interior. At the end of 2009, IDB approved a technical assistance program whose objective is to promote and support the use of renewable energy in Suriname's interior areas, for the purpose of ensuring the sustainable development of these regions, offering alternatives to reduce dependence on fossil fuels and ensuring the adequate use of their natural resources. The outcomes of this technical assistance may help improve conditions for providing electricity in rural areas of the country's interior.

TRINIDAD AND TOBAGO

1. Institution responsible for energy efficiency

There are no laws or regulations aimed at the rational use of energy, whether indicative or mandatory.

However, the Government has agreed to include this subject in its medium-term sustainable development goals, stemming from its statement at the Workshop for Promoting Energy Efficiency in the Caribbean, held in May 2010 in Port of Spain.

The government agency in charge of managing and developing petroleum and mining resources in the country is the Ministry of Energy and Energy Industries (www.energy.gov.tt).

The Ministry's website describes its principal activities; none of them deals with actions, projects and/or programs for efficiency in the use of energy. It also cites the Ministry's strategic objective and makes no mention of energy efficiency in the area of energy planning.

2. Market for efficient equipment

There is a Green Building Certification, which will allow Trinidad and Tobago to meet international standards in the construction of efficient buildings.

3. Equipment labeling

No system has been implemented for the labeling of energy-efficient equipment. Imported equipment comes with labels from the countries of origin.

4. Access to energy

The current percentage of electricity coverage in Trinidad and Tobago is over 97 percent in urban areas. There is no information on the percentage of coverage in rural areas.

Most of the existing electrical power plants are simple-cycle gas turbines and steam turbines with an average thermal efficiency of 25 percent. The strategy of the Electricity Commission of Trinidad and Tobago is to have a plan for the expansion of electricity supply that uses high-efficiency generation (over 40 percent), operating as combined cycle, to meet the country's needs for electricity supply until 2018.

URUGUAY

1. Existing regulation

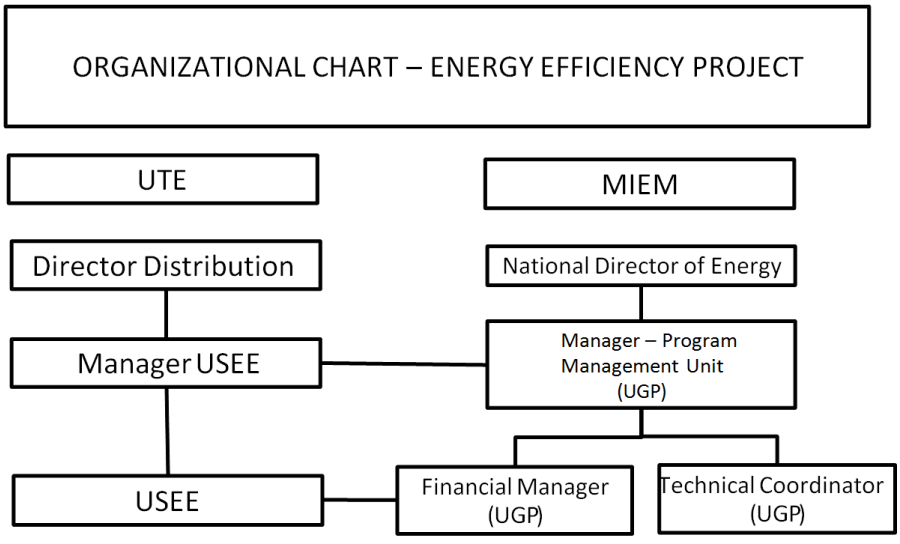
A Legal-Institutional Framework has been established for energy efficiency in Uruguay. It has been formalized through a series of Laws, Decrees and Resolutions that provide the legal-institutional framework to make energy efficiency a State policy and establish the rules for promoting business activity.

- Law 18.587: Efficient use of energy
- Decree 408/08: Public lighting
- Decree 311/06: Summer hours
- Decrees 527/08 and 152/010: Energy efficiency in the public sector
- Decree 306/09: Energy efficiency labeling
- Decree 354/09: Promotion of investments in energy efficiency
- Resolution 2928/09: Municipal regulation of thermal isolation
- The National Energy Efficiency Plan is defined, and institutionality is established for energy efficiency.
- Mandatory energy efficiency labeling is determined.
- The responsibilities of energy companies are modified.
- Sources of financing and their distribution are established.
- The need to remove economic and administrative barriers to energy efficiency is established.

The Plan has a 15-year horizon and will be reviewed and evaluated every 5 years.

2. Institution responsible for energy efficiency

Energy efficiency activities in Uruguay are the responsibility of the Energy Efficiency Project Management Unit *(Unidad de Gerenciamiento del Proyecto de Eficiencia Energética)* (www.eficienciaenergetica.gub.uy). Its location in the Government of Uruguay's organizational chart for energy issues is as follows:



The National Director of Energy has overall responsibility for project execution, with the support of the Project Management Unit headquartered in the Ministry of Industry, Energy and Mining *(Ministerio de Industria, Energía y Minería,* MIEM).

The component under the responsibility of UTE (the Uruguayan public enterprise dealing with energy) is executed by the Energy Efficiency Services Unit *(Unidad de Servicios de Eficiencia Energética, USEE)*. The Project Management Unit *(Unidad de Gerenciamiento del Proyecto, UGP)* is in charge of coordinating project activities.

The GEF/World Bank Energy Efficiency Program began its operations in 2005.

3. Organization and definition of national programs: programs under execution

Energy Efficiency Program in Uruguay

The Energy Efficiency Project is one of the instruments that supports the strategic guidelines and policy defined for the Uruguayan energy sector, and contributes to: increasing competitiveness; encouraging private sector participation; diversifying energy sources; protecting the environment; supporting programs and technologies that promote efficient uses of energy; and facilitating access by isolated, low-income rural households to modern sources of energy that can meet their basic needs.

Specific Objectives: to promote energy efficiency and environmental protection, correcting market failures and increasing institutional capacity; to increase the economy's efficiency by reducing energy intensity; to reduce the economy's exposure to external shocks; to encourage private sector participation by supporting energy service companies *(empresas de servicios energéticos, ESCOs)*; and to promote the generation of a suitable legal-institutional framework for the development of energy efficiency in Uruguay.

Expected results in the 15-year life span of the Energy Efficiency Project:

- US$22.7 million in energy efficiency investment at project completion
- US$6.2 million in project financing through the Energy Efficiency Trust Fund
- 10 ESCOs operating
- 250 stakeholders trained in energy efficiency practices
- 559 ktep of energy saved at project completion
- 1.4 million tons of CO_2 emissions avoided

4. Support to ESCOs

Some of the objectives of the Energy Efficiency Project are to develop the market for energy service companies and contribute to strengthening them by generating the necessary conditions for project execution under the scheme of Performance Contracts between ESCOs and energy consumers. (See market development plans: http://www.eficienciaenergetica.gub.uy/escos_planes.htm)

This will be achieved by creating links between ESCOs and energy consultants with energy-using companies and financial and support institutions. To do so, information is being collected on energy consultants and on companies interested in becoming ESCOs, as well as on the identification of areas of opportunity in energy-using facilities interested in project development.

The existing energy service companies appear in the list of companies registered to date:
http://www.eficienciaenergetica.gub.uy/escos_listado_escos.htm.

5. Schemes or mechanisms to finance energy efficiency efforts

During the period of effectiveness of the Uruguay Energy Efficiency Project, energy efficiency activities are financed by a Global Environment Facility (GEF) grant, through the World Bank, which is contributing US$6,875,000, and by counterpart funds from the Ministry of Industry and Energy and the electricity company UTE, which together will contribute US$8,200,000.

GEF is contributing funds for the implementation of the Uruguay Energy Efficiency Project through a grant to the Uruguayan Government, to the Ministry of Industry, Energy and Mines, channeled through the World Bank.

The Ministry of Industry, Energy and Mines and UTE are contributing the remainder of the funds for project implementation, in the form of local counterpart.

Once the Energy Efficiency Law comes into effect, energy efficiency activities will be financed by the Uruguayan Energy Efficiency Trust Fund *(Fideicomiso Uruguayo de Eficiencia Energética, FEE)*. This Trust Fund administers the funds collected from the tax levied on sales of energy (electricity and fuels) and on the installation of new power plants that use fossil fuels.

Energy Efficiency Trust Fund

In October 2008, the contract between the Ministry of Energy and Mines and the National Corporation for Development *(Corporación Nacional para el Desarrollo, CND)* for the creation of the Energy Efficiency Trust Fund *(Fideicomiso de Eficiencia Energética, FEE)* was signed.

In December 2008, the financing was officially launched. In January 2009, grant funds were disbursed for the capitalization of the FEE: US$2.5 million for the formation of the guarantee trust fund that will form part of the National Guarantee System *(Sistema Nacional de Garantías, SNG)*.

Once the initial contracts with financial market institutions are signed, the process to grant the first loans for energy diagnostics began.

Funds come from the grant received by MIEM from the Global Environment Fund, through the World Bank.

Two lines: 1) Technical assistance by ESCOs; 2) Project implementation.

As of July 2010, FEE's activities imply an accumulated energy saving of 7 ktep and an emission reduction of 16 kton CO_2.

6. Fiscal, economic or tariff incentives

Subsidies from the Energy Efficiency Fund are granted to energy saving projects through an Energy Savings Certificate scheme; investments are also promoted through fiscal incentives for projects that save energy.

7. Market for efficient equipment

National Technical Standards for Energy Efficiency. Over 35 standards for electrical appliances, gas appliances, buildings and solar collectors have already been approved.

Test laboratories

In October 2009, the laboratory for testing the energy efficiency of water heaters was inaugurated. The first facility in the country aimed at conducting efficiency tests, this laboratory, together with two others that are currently being modified, will form part of the network of Uruguayan national laboratories dealing with this subject.

8. Equipment labeling

Energy efficiency labeling was put into effect in September 2009 and the first equipment to be labeled will be compact fluorescent lamps and electric water heaters.

***"A Todas Luces"* Program: the first milestone in national labeling**

As of July 2010, 1,589,830 lamps labeled with efficiency level "A" in accordance with the UNIT standard had been delivered to residential users. This implies a 14 percent level of penetration of efficient lighting in the country's entire urban residential lighting stock. Savings of 94,000 MWh/year.

In September 2009, the decrees that launched the energy efficiency labeling operation for electrical and gas equipment became effective. Labeling becomes a mandatory application and a requirement for marketing throughout Uruguay, once the temporary periods established in the individual decrees expire.

9. Access to energy

Overview of access to energy, selecting three indicators:[28]

- Indicator 1 = Degree of electricity coverage (98.5 percent)
- Indicator 2 = Per capita residential electricity consumption (kWh-year/no. inhabitants) (850)
- Indicator 3 = Amount of residential electricity bill in relation to household income (5 percent)

These indicators reflect significant distribution in access to and use of electricity.

Access to electricity service provided by UTE (the Uruguayan public enterprise responsible for generating, transmitting and distributing electricity) – 2008.

- With "formal" access: Total: 93.6%; Montevideo: 91.3%; Rural interior: 80.3%
- With "informal" access *("colgados")*: Total: 4.6%; Montevideo: 8.4%; Rural interior: 0.6%
- Without access: Total: 1.8%; Montevideo: 0.3%; Rural interior: 19.1%

UTE is conducting rural electrification projects under the framework of its basic principles:

- Universalization of electricity service: contributes to helping people remain in rural areas and serves as a development springboard for national production.

These works are carried out through various forms of international cooperation and with the active participation of the community; for example, the agreements aimed at social inclusion, with the Ministry of Social Development and the National Public Education Administration *(Administración Nacional de Educación Pública)* (www.anep.edu.uy).

[28] Source: Jorge Molinari, "Access to energy and poverty reduction to achieve Millennium Development objectives: an analysis of the Uruguayan electricity sector", Santiago de Chile, October 2009.

Under the framework of the National Plan to Address the Social Emergency *(Plan Nacional de Atención a la Emergencia Social)* (2005–2007), the Ministry of Social Development and UTE signed an agreement under which a discount in the simple residential tariff is granted. Objective: to take an initial step toward forming a Basic Energy Basket.

Target audience: the population that received the "Citizen Income" *(Ingreso Ciudadano)* from the Emergency Plan (approximately 80,000 families) and that meets the following requirements:

- Present proof of receiving the "Citizen Income".
- Have 2.2 kW of contracted power.
- Have a single supply in his or her name.
- If a new client, he or she must belong to an electrified zone and have interior installations in adequate condition.

VENEZUELA

1. Existing regulations

As background, the Ministry of Popular Power for Energy and Petroleum of Venezuela *(Ministerio del Poder Popular para la Energía y Petróleo de Venezuela)*, under the framework of cooperation between the CEPAL Project/European Commission on "Promotion of the Efficient Use of Energy in Latin America", prepared a draft Law to Promote Energy Efficiency (2001) and conducted a study on the Venezuelan legal framework.

The Simón Bolívar National Project *(Proyecto Nacional Simón Bolívar)*, in its First Socialist Plan for the 2007–2013 period, states as a strategy and policy, under the guideline "Venezuela: World Energy Power" *("Venezuela: Potencia Energética Mundial")*, the promotion of the rational and efficient use of energy.

In response to this policy, the Energy Revolution Mission *(Misión Revolución Energética)* was created in 2006. In addition, the Organic Law of Hydrocarbons and the Decree with Rank and Force of the Organic Law of Gas Hydrocarbons and the Organic Law of Electricity Service establish guidelines aimed at introducing energy efficiency in the activities that they regulate.

2. Institution responsible for energy efficiency

Ministry of Popular Power for Energy and Petroleum (*Ministerio del Poder Popular para la Energía y Petróleo, MENPET)* (www.menpet.gob.ve)

The regulation, formulation and monitoring of policies, planning, conduction and monitoring of the activities of the National Executive Authority on the subjects of hydrocarbons, energy in general, petrochemicals, carbochemicals, and similar or related subjects, is in the hands of the Ministry of People's Power for Energy and Petroleum *(Ministerio del Poder Popular para la Energía y Petróleo, MENPET).*

The General Bureau of Electrical Energy and the General Bureau of Alternative Energy are under the responsibility of the Office of the Vice Minister of Energy.

Foundation for the Development of Electricity Service *(Fundación para el Desarrollo del Servicio Eléctrico, FUNDELEC)*

This is an agency assigned to MENPET that provides comprehensive advice on the operation of the electricity sector and on the different circumstances that may arise with respect to service. Its functions include coordinating the Cooperation Project for the Integrated Training of Personnel of Cuba and Venezuela *(Proyecto de Cooperación para la Formación Integral de Personal de Cuba y Venezuela)*, under the scope of the Rational and Efficient Use of Electrical Energy.

National Electricity Corporation *(Corporación Eléctrica Nacional, CORPOELEC)* (www.corpoelec.gob.ve)

The National Electricity Corporation (CORPOELEC) is a state-operated enterprise in charge of carrying out generation, transmission, distribution activities and the marketing of electrical power and energy, and is under the authority of the Ministry of People's Power for Energy and Petroleum.

CORPOELEC gives support to the Energy Revolution Mission by implementing actions aimed at sustaining the program for replacing incandescent lightbulbs with energy-saving lamps and at the installation of distributed generation plants, through the construction of locations for power unit batteries.

3. Organization and definition of national programs: programs under execution

In 2006, the President of the Bolivarian Republic of Venezuela announced the start of the Energy Revolution Mission whose aim was to promote the efficient use of energy in the country, with the following programs:

- Program to replace incandescent lightbulbs with energy-saving lamps.
- Vehicle Natural Gas Program.
- Replacement of obsolete gas infrastructure and national gasification.
- Creation of energy efficiency standards.
- Renovation of the electricity generation pool and conversion of diesel-consuming generation units to gas.
- The use of alternative energy sources.
- Installation of alternative electricity systems in isolated communities.
- Installation of water purification plants in rural communities, using photovoltaic energy.
- Installation of distributed generation plants.
- Carry out campaigns to educate, inform and raise the awareness of the population.

Actions:

- Replacement of lamps in the residential sector: 53.16 million lamps. In other sectors: 15.36 million lamps.
- Residential sector: replacement of 36,417 air conditioning equipment units.
- Fuel substitution: the objective is to promote the use of natural gas as a fuel alternative to be used in the nationwide automotive pool to improve environmental quality, increase the exportation of liquid fuels and foster the sustainable development of Venezuela.
- Other actions: Pilot study on energy efficiency in four large electricity consumers on the Island of Margarita, State of Nueva Esparta.
- Pilot Study on Energy Efficiency in Aluminum Industries (CVG-ALCASA).

CORPOELEC carried out the third phase of replacing incandescent bulbs with energy-saving lamps; it began in February 2008 and involved the replacement of 11.3 billion bulbs, as reflected in a 569.7 MW reduction in the load curve and assistance to 1,890,000 families.

4. Schemes or mechanisms to finance energy efficiency efforts

Under the framework of several bilateral energy agreements, the State has allocated resources to carry out energy efficiency projects. This is the case of the Cooperation Project for Integrated Training of Personnel of Cuba and Venezuela, cited in 2 b).

Under the scope of the above project, CORPOELEC has invested in training by promoting energy efficiency certificate programs in several of the Corporation's branch offices, under the auspices of the Ministry of People's Power for Energy and Petroleum, the Foundation for the Development of Electricity Service, and the Energy Agreement between Cuba and Venezuela and the National Experimental Polytechnic University *(Universidad Nacional Experimental Politécnica, UNEXPO)*.

Currently, CORPOELEC is providing support to the Energy Revolution Mission in order to successfully complete the third phase of replacing incandescent lightbulbs with energy-saving lamps.

5. Fiscal, economic or tariff incentives

Specific incentives of this nature are applicable only to the construction sector. The purpose of the incentives is to encourage the design and construction of buildings with higher thermal quality than that required by the regulation (Ordinance on Thermal Quality of Buildings in the Municipality of Maracaibo). Thus, a special certification is established, recognizing the additional effort for contributing to the efficient use of electrical energy, through a rating scale that improves the thermal quality required by the regulation between 10 percent and 30 percent. Two types of incentives are established: urban and fiscal.

6. Market for efficient equipment

The market for efficient equipment in Venezuela needs to be expanded; it currently includes compact fluorescent lamps, refrigerators and freezers, and air conditioners.

7. Equipment labeling

Through a Joint Resolution by the Ministries of Popular Power for Commerce and for Energy and Petroleum, it is mandatory to place the "Consumption Guideline" label that indicates energy consumption in refrigerators and freezers.

Building codes

Ordinance on Thermal Quality of Buildings in the Municipality of Maracaibo: A mandatory legal instrument whose purpose is to ensure that the design and construction conditions of new buildings meet the limits of the Overall Thermal Transfer Value of roofs and walls, stipulated for the Municipality of Maracaibo, in order to seek comfortable thermal conditions, achieving a reduction in electricity consumption through the use of air conditioners.

8. Access to energy

The percentage of electrification in Venezuela totals 97 percent, with a three-point increase in recent years (June 2010). According to OLADE statistics, the percentage of electrification in rural areas is 95 percent and in rural areas 97 percent.

Project in rural areas: the rural electrification project for isolated communities in Venezuela was formalized at the end of 2009. The project is composed of 48 hybrid systems—wind, photovoltaic, diesel—to supply electricity to small communities divided into groups of 10, 20, 30 or 40 houses, respectively. It is currently being executed in the different locations selected for the installation of these systems.

In addition, the Inter-American Development Bank (IDB) approved a US$200 million loan to aid Venezuela in optimizing its electricity services through support for the corporative and institutional strengthening of CORPOELEC, particularly in terms of resources for the management of commercial, administrative and environmental administration areas.

Although Venezuela is one of the countries with the most electricity coverage in the region, the sector needs to be modernized; in particular, it must reduce energy losses as well as losses due to lack of payment collection. In order to address these challenges, CORPOELEC has undertaken a strategy based on absorbing all public electricity companies and assuming the responsibilities for generation, transmission, distribution and commercialization.

The IDB loan has a 20-year life cycle, with a 5-year grace period, at a LIBOR-based variable interest rate. The Government of Venezuela will contribute an additional US$50 million.

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34. Dominican Republic – Programmatic Power Sector Reform Loan – Report as of September 22, 2009 (www.wds.worldbank.org)

35. Bolivia: "Rural Energy and Energy Efficiency Report on Operational Activities" (www.esmap.org/esmap/sites/esmap.org/files/)

36. Annecke Wendy, Endelli Marialba and Carpio Claudio, "Report on the accessibility and socio-economic impact of prepayment meters in Merlo, Buenos Aires, Argentina" (2004); report for ACCESS Program, Electricité de France, Paris

37. Urban and Periurban Access – UPEA II – Buenos Aires case study, Energy Economics Institute – Fundación Bariloche IDEE/FB – April 2008 (www.gndes.org/downloadables/UPEA_II/FB Final.pdf

38. IV Meeting of Latin American Former Presidents – Social Forum: "Access to electricity service and poverty in Latin America and the Caribbean" – Presentation to the Global Center for Democracy, São Paulo, March 2009 – (www.corporacionesescenarios.org)

39. Rural Electrification – Twice-monthly report of the National Society for Mining, Petroleum and Energy of Peru (Sociedad Nacional de Minería, Petróleo y Energía del Perú [SNMPE]) (www.snmpe.org.pe)

40. Rural Electrification in Latin America and the Caribbean – Rural Electrification Workshop in Ecuador – www.tech4cdm.com/userfiles/

41. Lessons learned in the OLADE Rural Electrification Project (www.aep-peru.org/foroerural/ByronChiliquinga.pdf)

42. Energy and Poverty in LAC (Energía y Pobreza en LAC.pdf) – Byron Chiliquinga and Mentor Poveda, OLADE.

43. Latin American Experiences in the Development of Rural Electrification Projects (Experiencias Latinoamericanas en el Desarrollo de Proyectos de Electrificación Rural) (World Bank experience with rural electrification in Peru) (http://www.aep-peru.org/foroerural/EduardoZolezzi.pdf)

44. Energy and Poverty (Energía y Pobreza) – (www.energiasinfronteras.org/documentacion/energia y pobreza)

45. Growing with Energy (Crecer con Energía) – "Linking micro-enterprises and income-generating activities with energy services for the poor population in the South American Chaco" – Manuel Fuentes – IT Power – CINER (Bolivia) (http://www.crecerconenergia.net/archivos/PDF/g6_d31.PDF)

46. "Methodology for Inclusion of Social Variables", (www.olade.org/documentosElectrificacion.html)

List of websites dealing with energy efficiency, renewable energy, rural electrification and access to energy issues

(Compiled by: Biomass Users Network [BUN-CA – www.bun-ca.org])

1. http://www.undp.org: Homepage of the United Nations Development Programme (UNDP). Information of global relevance is available, highlighting the participation of energy and the environment as key aspects for achieving sustainable development, as well as subjects related to the objectives of the Millennium Project.

2. http://www.undp.org/gef/index.html: Section related to the GEF and the three implementation agencies (UNDP, World Bank and UNEP).

3. http://gefweb.org: Saving energy and facilitating the use of renewable energy technologies, expanding the provision of electrical energy to rural communities, reducing dependence on less-efficient technologies that pollute the air, and contributing to the reduction in greenhouse gas emissions are the key objectives of the projects that the Global Environment Fund (GEF) finances in different operational programs and strategic priorities in the Climate Change Thematic Area. The productive uses of renewable energy constitute one of its strategic priorities.

4. http://www.bun-ca.org: Biomass Users Network, a Central American NGO known as BUN-CA, makes available its expertise in the development of projects in the areas of Renewable Energy, Energy Efficiency and Agroindustrial Conversion, as well as a variety of texts and manuals stemming from the conduction of its field experiments since 1990.

5. http://www.fenerca.org: FENERCA is a program sponsored by the United States Agency for International Development (USAID) that seeks to increase the use of renewable energy in five countries of the Central American Region: Guatemala, El Salvador, Honduras, Nicaragua and Panama. FENERCA develops specialized tools for capacity formation that make it possible to formulate solutions and alternatives for the removal of existing barriers to small-scale renewable energy projects and for energy efficiency. These policies may be of a legal or financial nature. One of FENERCA's key areas of focus since 2000 has been support to projects related to the productive use of renewable energy.

6. http://www.nreca.org: The National Rural Electrification Cooperative Association (NRECA) is a service organization dedicated to representing the interests of United States electricity cooperatives and of the consumers they serve. In addition, the original purpose of NRECA's international programs is to export the US rural electrification model to developing countries.

7. http://www.fao.org: The Food and Agriculture Organization of the United Nations (FAO) conducts a variety of international activities aimed at eradicating hunger. By offering its services both to developed and developing countries, FAO acts as a neutral forum in which all countries, under equal conditions, can negotiate agreements and discuss issues. FAO is also a source of knowledge and information, including the productive uses of energy for food production. Since its founding in

1945, FAO has paid special attention to the development of rural areas, where 70 percent of the world's poor live.

8. http://www.esmap.org: The World Bank's Energy Sector Assistance Program (ESMAP) is a global technical assistance program that prepares and facilitates guidance on policies for sustainable energy development to governments of developing countries with economies in transition. ESMAP also contributes to technology transfer and knowledge about energy sector management, including the productive uses of energy, and the provision of modern energy services to the neediest people.

9. www.cepal.org: The Economic Commission for Latin America (ECLAC)/Comisión Económica para América Latina (CEPAL) is one of the United Nations' five regional commissions. Its headquarters are in Santiago, Chile. It contributes to the economic development of Latin America and the Caribbean, coordinates actions aimed at its promotion and strengthens the countries' economic relationships, both among its member countries and with other world nations.

10. http://www.oas.org: The Organization of American States (OAS)/Organización de Estados Americanos (OEA) conducts various programs in member countries of Latin America and the Caribbean: for example, sustainable development programs for biodiversity conservation, planning to address problems of global warming, mitigation of natural disasters, management of river basins, etc.

11. www.ccad.ws: During the Summit of Central American Presidents in San Isidro de Coronado, Costa Rica, December 10, 11 and 12, 1989, the Presidents of Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua signed, in mutual agreement, the Constitutional Agreement of the Central American Commission for the Environment and Development. Under this agreement, the Contracting States establish a regional cooperation scheme for the optimum and rational use of the area's natural resources, pollution control, and re-establishment of the ecological balance to ensure a better quality of life for the population of the Central American isthmus.

12. www.reeep.org: This is an active global organization (REEEP: Renewable Energy Efficiency Partnership) that structures policy initiatives for clean energy markets, including project financing.

13. http://www.itpower.co.uk: One of principal consulting firms on renewable energy and sustainable development. Since 1981, ITPOWER has undertaken nearly 800 projects in 91 countries for institutional and private clients. ITPOWER is established in the United Kingdom but it works worldwide through a network of regional offices.

14. http://www.energyhouse.com: With headquarters located in Bloomfield, New Jersey, USA, E+Co is an organization which assists in the creation of viable local businesses that provide clean, reliable and reasonably priced energy, facilitating the merger of human capital, financial resources and different technologies. With representation in Latin America, the Caribbean, Africa and Asia, E+Co offers business development services and provides loans and capital investments to clean energy and energy efficiency companies or projects, in which support for productive uses of energy is an important area of its work.

15. http://www.preeica.ca: Regional Electrical Energy Project for the Central American Isthmus–Proyecto Regional de Energía Eléctrica para el Istmo Centroamericano, known as PREEICA, helps Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica and Panama to carry out the process of reforming and restructuring their electricity sectors in order to improve efficiency, private sector participation, reliability and fairness in the provision of electricity, and to take advantage of the savings that can be obtained through regional cooperation.

16. http://www.olade.org: The Latin American Energy Organization/Organización Latinoamericana de Energía (OLADE) is a policy and technical support organization through which its Member States conduct mutual efforts to integrate and develop the regional energy market. OLADE promotes agreements among its members and conducts efforts to meet their energy needs through the sustainable development of different sources of energy.

17. www.worldenergy.org: The World Energy Council (WEC) is a global energy organization with members from 90 countries. Its programs include all types of energy, petroleum, coal, natural gas, nuclear energy and renewable energy.

18. http://europa.eu.int: This is the website of the European Union (EU), the democratic European countries that have agreed to work together for the sake of peace and prosperity. The energy section includes the issues of renewable energy, energy supply and development.

19. http://www.sandia.gov: The Renewable Energy Program of Sandia National Laboratories of the United States promotes the use of renewable energy technologies, especially in photovoltaic and wind-power systems for productive application in remote areas not connected to the public utility grid. This website has guidelines, manuals, presentations and interactive documents that provide information on photovoltaic energy and its applications, including water pumping and other types of uses.

20. www.nrel.gov: The National Renewable Energy Laboratory (NREL) is part of the United States Department of Energy and conducts programs dealing with forms of environmentally and economically sustainable energy.

21. http://www.nmsu.edu: New Mexico State University responds to the educational needs of the state's diverse population, offering comprehensive programs on subjects such as education and research, including sustainable energy. It also has a College of Agriculture and Home Economics which gives rise to projects related to productive uses of energy.

22. http://www.conuee.gob.mx: The National Commission for the Efficient Use of Energy–Comisión Nacional para el Uso Eficiente de la Energía (CONUEE) is a decentralized administrative agency of the Secretariat of Energy of Mexico. It has technical and operational autonomy. CONAE's objective is to act as a technical consultation agency for agencies and entities of the Federal Public Administration, as well as for the governments of federative entities and individuals on the subjects of energy saving, efficient use of energy, and use of renewable energy.

23. www.funtener.org: This website publishes the Energy Transition (Transición Energética) bulletin, which contains articles and news on climate change, renewable energy, co-generation and distributed generation, especially in the context of Mexico.

24. http://solar.nmsu.edu/funsolar: The Fundación Solar is a Private Development Organization–Organización Privada de Desarrollo (OPD) that was established in Guatemala in September 1994. This foundation coordinates efforts for the execution of projects related to the environment and to the management of renewable natural resources.

25. http://dei.uca.edu.sv: The José Simeón Cañas Central American University–Universidad Centroamericana José Simeón Cañas (UCA) in El Salvador has several departments and specializes in the teaching of Natural Sciences and Renewable Energy. The principal mission of these departments in the UCA is to serve as a scientific basis for the different careers of the Faculty of Engineering and Architecture and for Professors of Natural Sciences of the Faculty of Sciences of

Man and Nature, and to conduct research in various areas, under the University's social projection guidelines.

26. http://rds.org.hn: In Honduras, the portal of the Sustainable Development Network–Red de Desarrollo Sostenible (RDS) has websites specializing in different thematic areas, including productive uses in rural areas. The Network has spaces of general interest in the social-cultural, environmental and natural resources, economic and policy areas.

27. http://www.cne.gob.ni: The National Energy Commission of Nicaragua–Comisión Nacional de Energía de Nicaragua (CNE) is an inter-institutional agency assigned to the Executive Authority. Some of its functions include the formulation of objectives, policies, strategies and general guidelines for Nicaragua's energy sector as a whole. CNE is also in charge of indicative planning and development strategy in the energy sector. It is in charge of promoting rural electrification for the purpose of seeking the development and optimum use of the country's energy resources. It is currently the national executing agency for a UNDP/GEF Project that is developing the productive use of hydroelectricity in areas isolated from the National Interconnected System, including a climate change adaptation component.

28. http://www.cnfl.go.cr: The National Power and Light Company–La Compañía Nacional de Fuerza y Luz is Costa Rica's principal electricity distribution company. It carries out sustainable actions that make it possible to meet its customers' needs in terms of programs, advisory services, projects and education on the Rational Use of Energy and on Demand Management, maintaining the population's quality of life and protecting the environment.

29. http://udenor.gov.ec: In Ecuador, the Northern Development Unit–Unidad de Desarrollo Norte (UDENOR) promotes and accelerates the sustainable development process, negotiating resources and coordinating the execution of the Preventive Alternative Development and Social Reactivation Program (Programa de Desarrollo Preventivo Alternativo y Reactivación Social) with a community and regional focus, through the application of effective, transparent management models. With regard to productive projects in rural areas, UDENOR assigns priority to the areas of forestation, education for production, and support to small industry. It is negotiating resources for the execution of forestry projects and has begun the operation of eight integrated educational farms.

30. http://www.ecuadorexplorer.com: Information on the Ecuadoran Foundation for Appropriate Technology–Fundación Ecuatoriana de Tecnología Apropiada (FEDETA) whose work focuses on the organization of sustainable projects dealing with biogas technologies in the agroindustrial sector.

31. www.conama.cl: The National Environment Commission–Comisión Nacional del Medio Ambiente is a Chilean State institution with the mission of promoting the environmental sustainability of the development process and coordinating actions stemming from government-defined environmental policies and strategies. Subjects include productive activities and energy.

32. http://www.pnud.bo/webportal: Program for Rural Electrification with Renewable Energy through the Popular Participation Process–Programa de Electrificación Rural con Energías Renovables Mediante el Proceso de Participación Popular. This program promotes the removal of barriers to the successful implementation of rural electrification projects using renewable energy technology, small hydroelectric plants and photovoltaic systems.

33. http://www.energetica.info/: Energética is a private, nonprofit Bolivian institution that has been working in the country's rural areas, in the fields of energy, development, environment and poverty, since 1993. Its main areas of focus are: Rural Energy Development, Natural Resources and

Environment, Energy Training and Promotion, and Institutional Development and Business Management.

34. www.ciner.org: The Center for Information on Renewable Energy–Centro de Información de Energías Renovables in Bolivia oversees the rational use of energy, promoting information sharing among institutions, businesses and people who work on energy issues.

35. www.bariloche.com.ar: The Bariloche Foundation–Fundación Bariloche is a nonprofit private institution for the public good, associated with the United Nations University (UNU), UNESCO, the International Federation of Institutes for Advanced Studies (IFIAS) and the Ibero-American Educational Television Association–Asociación de Televisión Educativa Iberoamericana (ATEI). It was founded on March 28, 1963 by a group of Argentine scientists and businessmen to contribute to the conduction of research, and to creative, training, technical assistance and dissemination activities. Its areas of operation include energy, environment and climate change. It is headquartered in San Carlos de Bariloche, Argentina.

36. http://www.ecotopia.com: This website illustrates how to develop and promote market methodologies, as well as technologies and products that help to conserve natural resources and lead our planet toward sustainability with the use of solar energy.

37. http://solstice.crest.org/renewables/re-kiosk/solar: Informational website on applications, technologies and economic aspects of solar energy (in English).

38. http://witss.gdl.iteso.mx/solar/curso.html: Online thermal and photovoltaic solar energy course by the Solar Group of the Institute for Technology and Higher Studies of Western Mexico–Instituto Tecnológico y de Estudios Superiores de Occidente, Mexico.

39. http://www.dianet.com.ar/dianet/users/Solis/Informe2.htm#Energía Solar: This website provides information mainly on the functioning of solar energy and other energy sources.

40. http://aleph.gdl.iteso.mx:8080/acad/deptecno/invest/solarcap09.htm: This website provides information on water heating for household use.

41. http://www.rwedp.org: Website of the FAO biomass project in Asia, with information on its production, processing and use, and with emphasis on project development in the Asian context, but possibly relevant for Latin America.

42. http://www.cookstove.net: This website provides information on improved cookstoves.

43. http://omega.ilce.edu.mx:3000/sites/ciencia/volumen3/ciencia3/119/htm/orosolar.htm: "Solar Gold and Other Energy Sources", information on different energy sources, including hydraulic energy, Digital Library of the Latin American Institute for Educational Communication–Biblioteca Digital del Instituto Latinoamericano de la Comunicación Educativa.

44. http://ww.unam.edu.ar/microt/barney0.htm: Methodological guideline for the implementation of small hydraulic projects.

45. http://www.microhydropower.net/: Website dealing with micro-hydropower systems, with a focus on applications for developing countries.

46. http://www.windmillpower.com/homeSP.html: Website with information on manufacturers of wind energy systems for water pumping, such as Windtech International.

47. http://www.awea.org: Website of the American Wind Energy Association, with technical information on this subject.

48. http://www.igc.org/energy/wind.html: Internet resources on wind energy.

49. http://retscreen.gc.ca: The CANMET Energy Diversification Research Laboratory (CEDRL) in Canada has developed software for the analysis of renewable energy projects to help users identify, evaluate and compare cost-efficient opportunities for renewable energy.

50. http://ez.embajada-alemana-bolivia.org/Instrumentos_Institucionales.htm: The German Financial Cooperation Agency (Kreditanstalt für Wiederaufbau–KFW). This is a pluralistic, flexible system that includes bilateral aid implementation agencies (governmental) such as GTZ, KfW and DED, with representation in Bolivia, as well as large German NGOs partially financed by German Government funds and private support groups that mainly operate with their own resources from private donors.

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