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ACCELERATING ENERGY EFFICIENCY: INITIATIVES AND OPPORTUNITIES - LATIN AMERICAN AND CARIBBEAN

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SUSTAINABLE ENERGY FOR ALL

FUNDACIÓN BARILOCHE

Copenhagen Centre on Energy Efficiency

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UNEP DTU Partnership

Technical University of Denmark

Marmorvej 51, 2100 Copenhagen Ø

Denmark

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Foreword

The Sustainable Energy for All (SE4ALL) initiative was launched jointly in 2011 by the UN Secretary-General and the President of the World Bank. The initiative has three global, interlinked objectives for 2030, to:

1. provide universal access to modern energy services;
2. double the global rate of improvement in energy efficiency; and
3. double the share of renewable energy in the global energy mix.

Meeting these ambitious goals will require the mobilisation and partnership of governments, private sector, civil society and other stakeholders, and numerous activities are under way in all three areas.

The Copenhagen Centre on Energy Efficiency (C2E2) was established in 2014 and serves as the Energy Efficiency Hub of SE4ALL. One of the core activities of the Centre is to analyse and promote opportunities for accelerating energy efficiency uptake globally. As part of this broad mandate the Centre has engaged four regional partners in a detailed assessment of current energy efficiency policies, priorities and opportunities in selected countries in each region with the dual objectives of identifying key opportunities for support and at the same time being able to share experiences and best practice examples.

These partners include:

- The Asian Institute of Technology in Thailand for the Southeast Asia Region;
- The Bariloche Foundation in Argentina for the Latin America and Caribbean Region;
- The Centre for Energy Efficiency (CENEf) in Moscow for Eastern Europe, the Caucasus and Central Asia; and
- The Energy Research Centre at the University of Cape Town in South Africa for the African Region.

This report, prepared by Daniel Bouille and Beno Ruchansky from the Bariloche Foundation, is devoted to the Latin American and Caribbean region and provides assessment of existing energy efficiency policies and initiatives. The report analyses the barriers and opportunities and provides recommendations on future activities that would accelerate energy efficiency in these countries. Energy demand in Latin America and Caribbean countries will rise significantly in the coming decades as a result of population growth, enhanced economic activity and increased energy access. It is therefore extremely important to ensure that energy efficiency opportunities are fully utilised.

John M. Christensen	Jyoti Painuly	Tim Farrell
Director	Head	Senior Advisor
UNEP-DTU Partnership	C2E2	C2E2

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Abbreviations

ADEME	Agence de l'Environnement et de la Maîtrise de l'Energie)
BANDESAL	Banco de Desarrollo de El Salvador
BCIE	El Banco Centroamericano de Integración Económica
BEU	Useful Energy Balance
BIEE	Base Indicators for Energy Efficiency
BROU	The Bank of the Oriental Republic of Uruguay
C2E2	Copenhagen Centre on Energy Efficiency
CAF	Andean Finance Corporation
CAFE	Corporate Average Fuel Economy
CARICOM	The Caribbean Community
CDM	Clean Development Mechanism
CEHDES	The Honduran Business Council for Sustainable Development
CEL	Comisión Ejecutiva Hidroeléctrica del Río Lempa
CENEf	The Centre for Energy Efficiency
CFLs	Compact fluorescent lamps
CIURE	Institutional Committee for the Rational Use of Energy
CNE	The National Energy Commission
CNEE	The National Committee for Energy Efficiency ()
CNFL	The National Power and Lighting Company
CNPML	The Foundation National Center for Cleaner Production in El Salvador
CICR	Costa Rica's Chamber of Industry
COHCIT	The Honduran Council of Science and Technology
COMEX	The Committee for Foreign Trade
CONAMYPE	Comisión Nacional de la Micro y Pequeña Empresa
CONEE	The National Council for Energy Efficiency
CONPET	Programmes for fuel saving in carriers
CONUEE	The National Commission for the Efficient Use of Energy
DEE	The Division of Energy Efficiency
DICA	Dirección de Innovación y Calidad
DOE	Department of Energy
DSE	Energy Sector Directorate
ECPA	the Energy and Climate Partnership of the Americas
EE	Energy Efficiency
EEPB	Energy Efficiency in Public Buildings Project

EPFI	Ecuador Principles Financial Institutions
ESCOs	Energy Service Companies
ESPH	The Empresa de Servicios Públicos de Heredia
FENOGE	Non-Conventional Energy and Efficient Energy Management Fund
FIDE	the Mexican Trust for the Saving of Energy
FODEE	National Energy Efficiency Fund
FONDEPRO	Fondo de Desarrollo Productivo
FUDAEE	The Uruguayan Trust for the Development of Energy Efficiency
GAUREE	The Autonomous Generation and Rational Use of Electric Energy
GEA	The Guyana Energy Agency
GEF	Global Environmental Facility
GHGs	Greenhouse Gases
GIC	German International Cooperation
GIZ	Gesellschaft für Internationale Zusammenarbeit
GMSA	The Guyana Manufacturing Services Association
ICE	Costa Rican Institute of Energy
IDB	Inter-American Development Bank
IFC	The International Finance Corporation
IIFs	the Financial Intermediaries Institutions
INER	The National Institute for Energy Efficiency and Renewable Energy
INTECO	Institute of Technical Norms of Costa Rica
IPEEC	The International Partnership for Energy Efficiency Cooperation
HPS	high pressure sodium
LAC	Latin America and Caribbean
LAC-EE Network	The Latin American and Caribbean Network for Energy Efficiency
LATU	The Technological Laboratory of Uruguay
LED	Light Emitting Diode
LSQA	LATU and Quality Austria Association
MDG	Millennium Development Goals
MEER	Ministry of Electricity and Renewable Energy
MEPS	Minimum energy performance standards
MIEM	The Ministry of Industry and Mines
MINAEM	The Ministry of Environment, Energy and Seas
OHN	The Honduran Standardisation Agency
OLADE	The Latin American Energy Organisation
ONUDI	The United Nations Organisation for Industrial Development
ONURE	The National Office for the Rational Use of Energy
NCPC	National Cleaner Production Centre
NDC	The National Corporation for Development
NEEP	National Energy Efficiency Programme
NIE	The Ecuadorian Standardisation Institute

OAS	Organisation of American States
OSN	Organismo Salvadoreño de Normalización
OSARTEC	Organismo Salvadoreño de Reglamentación Técnica
PALCEE	The Programme for Energy Efficiency in Latin America and the Caribbean
PAEE	The Strategic Plan for Energy Saving and Efficiency
PEER	Regional Programme on Energy Efficiency
PEN	National Energy Policy
PESIC	The Programme for Energy Efficiency in the Industrial and Commercial Sectors
PIEE	Integrated Energy Efficiency Plan
PLANE	The National Energy Efficiency Plan
PNAEE	National Plan of Action for Energy Efficiency
PROURE	Programme for the Rational and Efficient Use of Energy
ROC	The Register of Certification Bodies
RTEs	Technical Regulations
SE4ALL	Sustainable Energy for All
SECCI	The Sustainable Energy and Climate Change Initiative
SEST / SENAT	Programme of Training and Information for Drivers
SEMARNAT	Project Clean Transportation
SEN	The National Electrical System
SERNA	the Secretariat of Natural Resources and Environment
SIGET	Superintendencia General de Electricidad y Telecomunicaciones
SMEs	Small and Medium Enterprises
SNE	The National Secretariat of Energy
TCG	Technical Coordination Group
UCA	Universidad Centroamericana "José Simeón Cañas"
UDB	Universidad Don Bosco
UNAC	The Normative Unit of Procurement and Contracts for Public Administration
UNDP	United Nations Development Programme
UNIT	The Uruguayan Institute of Technical Standards
UREE	The Efficient Use of Energy
URSEA	Commission of the Energy and Water Regulatory Body
UTE	The Public Utility
VAT	Value-Added Tax
WSG	Work Service Group

Executive Summary

Latin American and Caribbean (LAC) countries face an urgent need to advance economic development and social welfare by enabling progress in priority areas such as health, education and infrastructure. If we add to these needs vulnerabilities in the energy sector, it is difficult to see an obvious path to the enhanced social and economic ambitions of LAC societies. Energy efficiency measures implemented in a strategic manner offer the opportunity to advance societal objectives by transforming the productivity and resilience of country energy systems.

Despite some success stories, such as the mass campaigns to replace incandescent bulbs with compact fluorescent lamps (CFLs) and the growing interest that governments have shown in promoting energy efficiency in the last ten years, there remains a large untapped potential. Some LAC countries have introduced *policy, regulatory and institutional frameworks,* with a number of countries already having an Energy Efficiency Act or considering its adoption. However, the implementation of energy efficiency activities has generally been limited in the LAC region, often being prioritized as a response to crises or deficits in energy supply.

The success or failure of past policy and programmes in the LAC region can help to overcome barriers and explore opportunities for increased action on energy efficiency. Quantified short-, medium- and long-term targets can also help to accelerate the uptake of energy efficiency measures. The evaluation of energy efficiency programmes has typically not been prioritized in the region and improved data collection will help to draw firmer conclusions about the success of national programmes. The institutional framework should define the responsible authority for delivering the outcomes along with the required instruments, resources and capacities. Increased cooperation and coordination between different ministries is required to increase the effectiveness of energy efficiency policies and programmes. Appropriate economic and financial management and support is needed to sustain activities which are lacking in many countries that depend on international funds, thus producing a “stop and go” on policies. This situation does not provide sufficient motivation to the private sector to invest in energy efficiency, a key step in enabling durable financial flows for energy efficiency. Utilities could increase their efforts on promoting energy efficiency in the LAC region contributing to reduced losses, improved productivity, and the uptake of new technologies. Energy Service Companies (ESCOs) are not well-developed in the LAC region, and introducing generalized subsidies reduces the benefits of energy efficiency over the long-term while sending the wrong signal to consumers.

This report provides observations on energy efficiency efforts in several countries in the LAC region with the aim of informing and supporting the future development and acceleration of energy efficiency policies and programmes. The status of energy efficiency in 14 LAC countries was considered through highlighting barriers to increased uptake as well as examples of past, present and planned energy efficiency initiatives. This report highlights that there are many common barriers and opportunities shared by LAC countries. For example, while there has been increased action and interest to establish standards and labelling programmes for equipment and appliances in the LAC region, the region faces a lack of adequate testing laboratories. The transport sector is highlighted as another high priority sector in the region where massive opportunities exist for increased efficiency. Lack of financing for energy efficiency improvement and innovation is an example of the common barriers shared by a number of LAC economies.

Enhanced regional collaboration and coordination is highlighted as an important factor that will contribute to increased energy efficiency action in the LAC region. A number of LAC countries are engaged in a range of regional and sub-regional initiatives and networks to promote energy efficiency. For example, in 2011 ECLAC launched Base Indicators for Energy Efficiency (BIEE) to improve the quality of statistics and performance indicators to quantify the results of national energy efficiency programmes. Today 19 LAC countries have joined the initiative and are represented by a country focal point. Another initiative established in 2011 by OLADE is the Latin American and Caribbean Network for Energy Efficiency (LAC-EE Network). This network also includes 19 LAC countries which promote energy efficiency in the region by facilitating the exchange of technical, legal and regulatory information between institutions and interested professionals.

This report also establishes a set of criteria that could be used to identify the progress of countries on energy efficiency related to the following areas:

- Institutional issues
- Legal and regulatory frameworks
- Financing resources and mechanisms
- Scarcity of resources or funding
- Sectors or uses of significant magnitude and specific weight
- Milestones of structural changes in energy policy
- Potential technological niche development
- Replicating actions in other countries in the region
- Degree of progress and local capacity
- The lack of a favourable policy environment and an abundance of energy resources.

These criteria enabled countries to be grouped based on the enabling conditions for the implementation of energy efficiency measures. The first group of countries consists of Argentina, Brazil and Mexico. They were not identified as priority recipients for technical assistance but rather as potential providers of technical support to other LAC countries. In particular, Brazil and Mexico have programmes in advanced stages of implementation and development, and sufficient domestic technical capacity to address the major challenges associated with the implementation of policies and strategies for energy efficiency.

The second and third groups of countries could be considered for technical assistance. Countries in the second group include Chile, Colombia, Costa Rica, Ecuador, Panama and Uruguay. Technical assistance and collaboration in energy efficiency may result from a country request according to various factors including country priorities, level of commitment and existing technical capabilities. These considerations could increase the effectiveness and impact of technical assistance. Also, experience from this group of countries could be adopted by, or modified for, other countries in the region. It is estimated that, in all cases, there is a very positive and receptive mood to technical assistance, coupled with an enabling environment that is stable, prioritized and represents a long-term vision.

Finally, the third group is where energy efficiency action is limited and includes countries such as Bolivia, the Dominican Republic, El Salvador, Guatemala, Guyana, Honduras, Nicaragua and Paraguay. This lack of energy efficiency activity can be expressed by the paucity of an adequate legal framework and institutional structures, absence of human and financial resources and a gap in information and data collection. However, in all of these countries energy efficiency is considered a

priority that should be high on the national energy agenda. It is likely that the experiences in accelerating energy efficiency among countries in the third group could generate lessons that could easily be extrapolated to other countries, as is the case with other countries in Central America.

This report analysed a diverse set of criteria important for accelerating energy efficiency in the LAC region, and it highlights a range of possible interventions that have been prioritized for a number of LAC countries. Some of these energy efficiency measures need to be initiated and led by governments at the national, regional or local levels. For example, this report could inform the development or update of National Action Plans on Energy Efficiency. In addition, this report provides criteria, priorities and progress of energy efficiency in selected LAC countries. This information could inform governments, Regional Organisations, Development Banks, Global Alliances, Energy Industry, Private Sector Development Banks and other stakeholders interested in designing targeted technical assistance programmes in the region. The information provided in this report also highlights the possible interventions in LAC countries that could support the SE4ALL goal of doubling the improvement rate of energy efficiency globally by 2030.

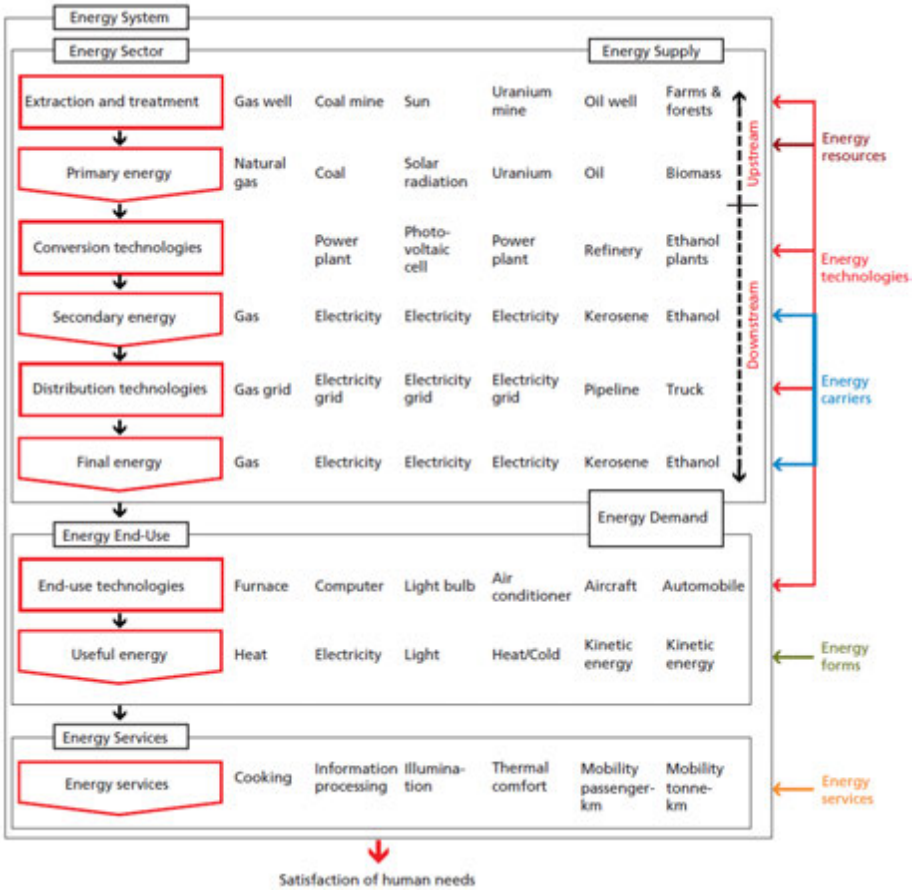
Contents

1. Introduction and background

In recent decades, a series of events has propelled the implementation of energy efficiency programmes worldwide. These programmes are currently considered an important component of improving competitiveness, ensuring an adequate supply of energy, increasing energy security, facilitating access to energy, reducing negative environmental impacts and, at the global level, reducing emissions of greenhouse gases (GHGs).

In the Latin America and Caribbean (LAC) region, increased action on energy efficiency could reduce the vulnerability of energy systems, improve the socio-economic environment, delay investments in energy infrastructure, reduce negative impacts on the local environment, and reduce the already relatively low level of emissions in the region (a result of its diversified energy balance, with high proportions of natural gas, LPG, hydropower and biomass), as well as enhance international negotiations and trade.

Figure 1.1 Schematic diagram of the energy system with some illustrative examples of the energy sector, energy end-use and energy services[1]



[1] GEA, 2012

A brief reference to topics raised in recent reports[2] recognises the realities and challenges in the LAC region that provide a framework of requirements and opportunities for energy efficiency, such as:[3]

- Many countries have a vulnerable energy system that is increasing its dependence on imported fossil fuels.
- High fuel costs, relative to national income, with price volatility impacts on consumers' energy costs, tariffs and prices.
- Old and inefficient energy supply infrastructure.
- Poor security of supply.
- High levels of technical losses in the power sector.
- Low load factor in power consumption.
- High rates of growth in demand against restrictions on the availability of funds for investments.
- High costs of production and the distribution of power and/or natural gas.
- Low level of access to modern energy sources.
- Generalized (i.e. not targeting specific actors in need) price subsidies for energy consumption.

Meanwhile the LAC region has a growing need to ensure development and welfare improvements in priority areas such as health, education and infrastructure. Given the additional vulnerabilities of the energy sector, energy efficiency measures offer an opportunity to improve the robustness of the energy system and reduce vulnerabilities and uncertainties affecting development.

Experience indicates that the key factors for consideration when implementing efficiency measures relate to technical, regulatory, economic, socio-cultural, inter-agency and environmental approaches.

Energy efficiency is linked to the proper allocation of resources in the production, distribution and consumption of energy. In this regard, the diversification and substitution of energy sources should be part of the overall strategy.

With respect to the substitution of energy sources, particularly regarding the expected role of renewable sources of energy, this should be part of any energy efficiency analysis. However, since the issue of renewable energy is addressed elsewhere in the SE4ALL programme, this report focuses on improvements in productivity, i.e., improvements to efficiency in energy consumption, as well as in supply according to national circumstances.

The reasons for successes and failures

Energy efficiency policies have received increased attention in the LAC region, reflecting the large untapped potential that exists. Many countries in the LAC region have the opportunity to incorporate energy efficiency further into the public policy agenda (understood as the set of actions, laws, institutions, and economic and regulatory instruments needed to implement programmes and plans).

Past experience with energy efficiency measures that have been carried out in the region allows us to highlight some issues, as well as present some preliminary findings on interventions and measures that could support an increased level of action on energy efficiency in the LAC region:

[2] CAF 2013

[3] Not all issues cited are applicable to all the countries in the region.

- The programmes, actions and measures implemented should include quantified targets for short-, medium- and long-term reach, as well as highlight how energy efficiency can contribute to the country's goals. Country strategies should define priorities, accountabilities, policies and resources in a timetable for the implementation of actions and measures to contribute to its fulfilment, as well as tracking and monitoring the results.
- Regarding evaluation of the results of the energy efficiency programmes that have been carried out, the thoroughness of the evaluation is based on the amount and quality of information available in each country. In most cases such information is still insufficient to draw firm conclusions about whether a national programme is on track, or is missing its targets and must be adjusted.
- The institutional framework should define the responsible authority for delivering the objectives, as well as for the provision of the required instruments, resources and capacities.
- Suppliers are reluctant to provide certain equipment, and guarantee their operation and transfer, in markets that are below a certain size. In the case of smaller and less developed countries, this is a very difficult obstacle to overcome, and there is a clear role for a regional cooperation strategy to support energy efficiency.
- Energy efficiency is a transversal issue: many of the actions it entails fall outside the scope of energy policy and require the agreement of other areas such as transport, industry, housing, health and education. The coordination of different sectors is another necessary condition that is only satisfied in a very few cases.
- The sustainability of an energy efficiency programme depends largely on adequate economic and financial management. Resources to ensure the feasibility of the programme should be available over the long term. In most countries, a large share of the funds applied to the promotion and development of energy efficiency comes from national budgets. Designing policies that motivate the private sector to invest in energy efficiency is a key step in enabling durable financial flows for energy efficiency. The necessary funding for policy design, implementation and evaluation should be a priority, and its availability should be an integral part of the programme or strategy itself.
- Governments in the region should pay special attention to commercial and technical losses (grid losses) and to system utilization in transmission and distribution systems. Many countries have electrical technical losses of about 13-14%, which is higher than many other regions of the world.
- Although utilities are central to promoting energy productivity, there are not many cases of energy utilities promoting energy efficiency in the LAC region. In all cases they have technical, financial and market development capabilities that do not exist elsewhere. Most lack regulatory and motivational drivers to engage in the implementation of energy efficiency. Establishing clear accountabilities and mandates for the utility delivery of pricing strategies and operational delivery programmes for energy efficiency would enable transformative progress in implementing energy efficiency policies.
- The market for ESCOs has seen little growth in the region. In most LAC countries energy efficiency initiatives directed at the transport sector are practically non-existent or at an early development stage.
- The existence of generalized subsidies (that is, not focused on the most economically vulnerable sectors of the population) means that energy prices do not adequately reflect the cost of making it available on the market, a situation that threatens the profitability of energy efficiency projects.

In LAC many studies have been carried out to estimate the potential for improving energy efficiency[4], usually based on the development of different prospective scenarios. These potentials are strongly determined by the technology mix, national circumstances, knowledge of available resources, the estimated evolution of the socio-economic system, the conditions given by the global context, and assumptions about the progress of access equity—to name just a few. The potential for energy efficiency improvements is dynamic, and various estimates highlight the importance of improving energy efficiency in the region[5].

This report neither estimates the potential of energy efficiency savings nor provides a compendium of energy efficiency actions in all LAC countries. Instead it focuses on identifying the possibilities for implementation support and technical assistance, country-driven, as well as the criteria that could be used to identify priorities and accelerate energy efficiency actions.

[4] Altomonte et al. 2003; Poveda 2007; ECLAC 2008, 2013; Kreuze et al. 2014

[5] CAF 2013; ECLAC 2013; OLADE/PALCEE 2013

2. Brief overview of recent developments in policies, mechanisms and programmes

Beyond a few exceptions like Mexico and Brazil, it could be argued that it was not until about 2005 that the implementation of energy efficiency policies, mechanisms and programmes gained momentum in the LAC region. In general, before that date actions in the direction of countries implementing energy efficiency were limited and taken in response to deficits in energy supply. Some countries went a step further, implementing progressive tariff schemes that sent a signal designed to prevent wasteful use of energy, as well as time-differential rates in order to encourage a better management of demand.

Since 2005 interest has increased in promoting energy efficiency throughout the whole LAC region. The significant increase in oil prices that began in 2004 (with a historical peak in 2007), as well as an increased sensitivity to environmental issues – particularly those related to climate change (namely, the belief that climate change is a reality and that one of the most effective ways to contribute to the mitigation of its effects is to apply cost-effective energy efficiency policies) – were key factors that contributed to the increased interest in energy efficiency in the region.

This interest was reflected in an increased effort to promote energy efficiency through the implementation of programmes, mechanisms or policies. To recall, *programmes* are defined as specific actions taken by agents (agencies, distributors, etc.) with the aim of modifying behaviour or consumer patterns (e.g. the Brazilian Labelling Programme). Conversely, *mechanisms* are instruments that support the implementation of specific programmes and that are aimed at the agents that develop and implement such programmes (e.g. Uruguay's Trust for Financing Energy Efficiency Projects). Energy efficiency *policies* require the existence of a well-oiled, coordinated machinery of programmes and mechanisms, sustainable over time, that follow standardized patterns of behaviour. A policy requires the definition of strategic lines, actions, instruments and measures; further, the feasibility, viability and effectiveness of these lines should have been subjected to careful analysis.

A recent publication by the United Nation's Economic Commission for Latin America and the Caribbean[6], an update of work carried out four years earlier[7], provides a comprehensive analysis of the current situation and recent developments in energy efficiency in the countries of the region. These studies focus on the analysis of the following aspects of "National Energy Efficiency Programmes":

- Political, regulatory and institutional frameworks
- Key actors in energy efficiency and their effective roles
- Resources and funding mechanisms for energy efficiency programmes
- Programmes and results (if known and determined)
- Barriers, both generally and country-specific
- Lessons learned in the development of programmes and/or national activities in energy efficiency.

[6] ECLAC 2013

[7] ECLAC 2009

With regard to advances in *policy, regulatory and institutional frameworks*, we can assert that recent years have seen substantial improvements in most countries, with some considerable variations. In ECLAC's earlier report[8], it was claimed that, although regulatory frameworks dealing with energy efficiency are very heterogeneous, there is a tendency to establish (or strengthen, if already existing) national energy efficiency programmes in order to "give the legal and regulatory sustenance to support the political decisions of governments in this matter." At present the trend has continued, and some examples include:

- The official publication of laws relating to energy efficiency in Uruguay (2009), including a law that establishes a trust for financing energy efficiency projects in Venezuela (2011) and Panama (2012)
- Supreme Decrees regulating Peru's Energy Efficiency Act (2007)
- A decree that spawned the National Programme for the Rational and Efficient Use of Energy in Argentina (2007)
- The preparation of draft laws in Guatemala, El Salvador, Nicaragua, Dominican Republic and Granada, among other countries.

These new laws and/or draft bills were added to existing ones, such as the Law on the Rational Use of Energy in Costa Rica (1994, the oldest of current laws), the Law for the Promotion of the Effective Use of Energy in Peru (2000), the Law on Energy Efficiency in Brazil (2001, resulting from a severe crisis in energy supply), and Law 697 on the Rational Use of Energy in Colombia (2001).

As for the *institutional structures* that support energy efficiency activities, in recent years there has been a consolidation of existing institutional actors, while other new players have entered the stage. Regarding the latter, we may cite as examples:

- Bolivia: since 2007, the Deputy Minister of Energy Development has been in charge of energy efficiency, to which we can add the creation in 2013 of the Bolivian Network of Energy Efficiency
- Venezuela: in 2009, the Ministry of Popular Power for Energy and Oil was created, which is responsible for energy efficiency activities
- Chile: in 2010, the Chilean Energy Efficiency Agency was created
- Cuba: in 2012, the National Office for the Rational Use of Energy (ONURE) was created;
- Colombia: in 2010, the Colombian Council of Energy Efficiency (private sector) was established
- Costa Rica: in 2012, creation of the Ministry of Environment, Energy and Seas (MINAEM)
- Ecuador: in 2012, creation of the National Institute for Energy Efficiency and Renewable Energy (INER)
- Mexico: in 2012, the National Commission for the Efficient Use of Energy (CONUEE) is relaunched.

With the exception of Chile, no institutions of the "Energy Efficiency Agency" type have been created in the period, although several ideas are being tested in other countries (e.g., Colombia, Granada, Peru, Trinidad and Tobago, and Jamaica—all of them intending to create an Energy Efficiency Unit, or the like, by law).

[8] ECLAC 2009

Regarding the *implementation of norms and standards* for energy efficiency, more equipment types have been progressively incorporated and have proved to be one of the best performing energy efficiency measures.

With regard to the *analysis of the key players in energy efficiency*, in most countries the activities, projects and programmes related to the promotion and development of energy efficiency are initiatives of the public sector, under the direction of ministries, commissions, departments or national organisations. In the case of Brazil, two of the most important current programmes are being led by public utilities in the energy sector (PROCEL-Eletrobras and CONPET-Petrobras), which nonetheless ensure that their activities remain in line with the policy guidelines emanating from the Ministry of Mines and Energy. In the case of Uruguay, one of its strengths in this area is the fact that the implementation of actions to promote energy efficiency are made in conjunction with the state-owned power company, UTE.

There are few cases of power utilities promoting energy efficiency among their customers. When they do so, they point to reduce peaks in demand to mitigate specific problems of supply. Also, few utilities actually carry out this kind of demand management in a systematic way.[9]

The market for ESCOs has seen little growth in the region. The implementation of performance-type contracts, with funding of investment by the ESCO, has not appeared to be a suitable instrument for their development. While in Brazil, and in some cases in Mexico, there are instances in which ESCO mechanisms have been applied, these are not good examples of systematic mass implementation, and they still confront several barriers.[10]

[9] The reference mentioned on Eletrobras is one of the few cases.

[10] Among the barriers to ESCOs in different countries, the most important are a lack of confidence on the part of the utilities in the capacity of ESCOs, a lack of access by ESCOs to financing mechanisms to support their activities, entrepreneurs being reluctant to open the doors of their enterprises to ESCOs, and the lack of local capacity to develop ESCOs.

Snapshot 2.1 ESCO-specific barriers in Brazil[11]

- ESCOs function mostly on a fee for service basis. They have few retained earnings, virtually no capital, and limited capacity to borrow against their assets
- They lack access to financing (as do many of their clients) without an adequate "balance sheet"
- There is a lack of know-how among banks on lending to SMEs in general, and ESCOs in particular
- Long-term revenues can be projected from their energy efficiency projects, but banks do not see the contract cash flow as adequate collateral
- Performance contracts are still not well understood by the market
- Interest rates for local currency financing are significantly higher than for US$ financing, with an average of 12-15% p.a. for good corporate credits and up to 50% p.a. for smaller companies with weaker balance sheets. The average cost of capital is currently at 16% p.a.
- Access to the public sector market is very limited, and attempts to access it remain largely unsuccessful because of the restrictive legislative and contractual environment. The major issue is the detailed technical description of the project parameters required prior to tendering for services. To add to this impediment, the law stipulates that these parameters be developed by an entity that is legally distinct from the bidding companies

With regard to the *resources and funding mechanisms* of energy efficiency programmes, ECLAC (2013) notes that, "in most countries, a large share of the funds applied to the promotion and development of energy efficiency comes mainly from national budgets, which means—with the exception of countries who have highly active energy efficiency policy—important limitations on its aims."

ECLAC (2013) also states that "there is still a high participation of multilateral agencies in the provision of funds for loans and/or for projects aimed at energy efficiency programmes or projects, as well as minor funding contributions (mainly of European origin) created *ad hoc* for specific projects. This proliferation of donors has no overall supervision, and this often leads to potential overlaps in interventions."

Since 2009 there has been an increase in the funds available for energy efficiency activities (though it is still insufficient), in some cases encouraged by the need to meet environmental objectives related to climate change. For example, Bolivia is designing a Bolivian Energy Efficiency Fund, Uruguay has created the Uruguayan Trust for the Development of Energy Efficiency (FUDAEE), and Argentina is establishing a development fund for energy efficiency projects with assistance from the Global Environmental Facility (GEF) and the World Bank. Chile is implementing the National Energy Efficiency Programme, which has involved a substantial increase in funding. In recent years, there has also been a moderate increase in the number of public and private financial institutions (the latter to a lesser extent) that have lines of support for the evaluation and implementation (if they show profitability) of energy efficiency projects. There is much progress to be made in improving the articulation of private financing with energy-saving opportunities.
Regarding *evaluation of the results of energy efficiency programmes* that have been carried out, the thoroughness of the evaluation is based on the amount and quality of information available in each country. As a result, and with some exceptions, the information is still insufficient to draw firm con-

[11] UNDP/IDB. BRA/09/G31 - Market Transformation for Energy Efficiency in Brazil PIMS 3665, GEFSEC Project ID: 2941 – 2009-2013.

clusions about whether a national programme is on track, or is missing its targets and must be adjusted.

In order to contribute to improving the quality of statistics and the development of a specific set of performance indicators to quantify adequately the results of national energy efficiency programmes, ECLAC (supported by OLADE and the European Union) is conducting the regional programme BIEE (Database of Energy Efficiency Indicators for Latin America and the Caribbean),[12] following the technical-political process and operating logic of the ODYSSEE programme of the European Commission. Currently seventeen countries[13] in the LAC region adhere to the BIEE programme, and the idea is that in the future all countries can join.[14]

Some of the *barriers to and reasons for the failures of* the development of energy efficiency activities and programmes in the region include:

- A lack of continuity on the part of institutions concerned with the promotion and development of energy efficiency and the application of energy efficiency policies. Very few countries have implemented real state-based and permanent policies on the subject.
- One of the main consequences of this lack of continuity is the inability of these institutions to retain qualified personnel in the field, with the consequent waste of significant resources and time invested in their training.
- In some countries, the structure that is responsible for energy efficiency occupies a very subordinate place in the organisational structure of the ministries and/or departments that manage energy issues (when they are not subsumed in orientation programmes of environmental scope), which conspires against the better promotion of their programmes.
- Beyond the significant increase in resources applied to advertising and dissemination, there remains, on a massive scale, insufficient knowledge about what actions can be performed, what economic benefits would be obtained, and what technologies could be applied to improving energy use. This applies particularly to the residential sector (with the exception of the now classic case of replacing incandescent bulbs with CFLs), to small and medium enterprises (SMEs), both commercial and industrial, and to the public service sector (hospitals, schools, municipal buildings, etc.). The culture of buying equipment based solely on the initial cost, without taking account of the operating expenses (energy consumption) throughout its useful life, continues to be standard practice for the vast majority of actors.
- In many countries, we can see that, although laws aimed at the promotion and development of energy efficiency does exist they have not yet been regulated. As a result, they do not yet have concrete applications and are therefore not effective in inducing energy efficiency actions and projects. This is particularly crucial when it comes to implementing mechanisms to promote the penetration of better energy-saving technologies, which is hampered by prices that are inaccessible to most people.
- The existence of generalised subsidies (that is, not focused on the most economically vulnerable sectors of the population) means that energy rates do not adequately reflect the costs of making it available on the market. This situation threatens the profitability of energy efficiency projects, increasing the recovery period of investment, and hampering their im-

[12] ECLAC launched the BIEE Programme in 2011; it has the support of the German Agency for International Cooperation (GIZ) and the technical support of the French Agency for Energy and the Environment (ADEME), in the context of the International Partnership for Energy Efficiency Cooperation (IPEEC).

[13] Argentina, Bolivia, Brazil, Colombia, Costa Rica, Chile, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, the Dominican Republic and Uruguay.

[14] Two recent reports from Argentina and Chile (CEPAL, 2014) highlight some of the pending issues.

plementation. This is especially the case because these investments compete, at the business level, with others (increased production, research and development, marketing-driven developments, working capital, etc.).

- In several countries, there are customs-related problems (or inefficiencies of control) in preventing the entry of inefficient equipment, products and/or vehicles, which enables these items to participate in the market at very favourable prices. This also undermines the success of programmes like the energy labelling of equipment.
- The influence of international cooperation in the development of energy efficiency projects and programmes in the region continues to be evident, to the point that there are overlaps between institutions. International cooperation is critically important, but if projects are activated only because there are cooperation funds available, the strategy of promoting and developing an effective policy or national strategy on energy efficiency (which may not be delegated) ceases to be sustainable.
- While the financial system has improved its understanding of the dynamics of energy efficiency projects, there is still great institutional reluctance to provide funds to finance efficiency projects. This reluctance to invest can relate to their lack of understanding about the profitability of investments, resulting in higher interest rates and/or more demanding guarantees for lending money.
- The market for ESCOs has not been consolidated due to the lack of readiness by financial markets to manage performance contracts (and because of exogenous variables such as inflation, high interest rates, a shortage of experts in this type of contract, etc., all of which can affect the potential returns). Perhaps the exception would be Brazil, whose public sector has significant difficulty in working on the basis of this type of contractual arrangement.
- There is still much distrust (especially in SMEs) of technical assistance from experts in saving energy. Some negative experiences have contributed to this lack of trust in companies that do not have highly specialised professionals on their staff.
- Most countries in the region do not have a set of indicators that adequately highlight the progress and success of energy efficiency programmes or projects. In this regard, as previously mentioned, ECLAC is working on the issue in the broader framework of MERCOSUR, and is also extending it to Central American countries and Mexico under the BIEE project.
- The ISO 50001 standard (Energy Management System) has not been widely adopted in the LAC region, and this has had an impact on the potential generation of systematic energy efficiency programmes.

Regarding *lessons learned*, the ECLAC report (2013), as well as others[15], discusses the difficulty of finding official documents that assess the experiences resulting from the development of national energy efficiency programmes. Here, it is stated that "the systematisation of lessons learned from national initiatives and energy efficiency experiences is scarce or plainly institutionally not there." This is due in part to a natural tendency to ignore failures and also partly to a lack of systematic information; the confluence of both situations automatically excludes from official reports anything that "did not work well"; this dilutes the effectiveness of the assessment process.

One lesson that emerges from experience in the region is that the mere existence of an Energy Efficiency Act or Law is not a sufficient condition to develop an energy efficiency policy. Conversely, the evidence also shows that countries with legal frameworks have been more active in developing and implementing policies and strategies. In any case the existence of a law[16] does not ensure a positive impact (i.e., a decrease) in energy intensity in the absence of a systematic development and implementation of activities, projects and programmes for the efficient use of energy adapted to each

[15] i.e. CAF, 2013

[16] In some cases the delay in the regulation of the law (Peru case) makes it totally inapplicable.

national situation. This situation is associated with the difficulties that states still have in controlling (and punishing, if the law determines it) behaviour that deviates from what the law requires. There are also cultural reasons[17] in LAC societies that contribute to poor compliance with energy efficiency regulations, coupled with a limited supply of human resources (for budgetary reasons), making it difficult to have an effective system of control and financial management.

While to a greater or lesser extent almost all LAC countries have defined policies regarding training and public information, there is an urgent need to increase efforts in these areas.

Finally, according to regional and national studies[18], the energy savings potential is significant: between 15% and 20% of energy consumption could be avoided through the deployment of best practices (without a loss of comfort) with a quick payback time.

One area of particular importance: Energy efficiency in transport

Energy efficiency in the transport sector has unique characteristics and relevance to the LAC region, and therefore is mentioned separately in this chapter. A recent document[19] highlights the current challenges in the transport sector.

In 2011, final energy consumption in the transport sector in Latin America stood at more than 1,500 million barrels of oil equivalent (MMboe), representing 35% of total energy consumption. In many countries, this sector accounts for the largest share of energy consumption. Energy consumption in the transport sector is clearly growing: between 1990 and 2010 it more than doubled in all LAC countries. Given the importance of transport in the region and given that it is a major source of fossil-fuel consumption and GHG emissions, it becomes urgent for LAC countries to review in detail their energy consumption patterns and improve their transport efficiency.
The significant expansion of the vehicle fleet and the growing number of cars per capita are generally not being met with corresponding expansions of the road network. Especially in the large cities in Latin America, congestion carries high economic costs and has a negative impact on the quality of life of its inhabitants, on comfort and commuting times, and also in relation to air pollution.

Countries in the LAC region could address transport efficiency through improved technologies and methods of use. Although technological advances are important in improving transport efficiency, they represent only part of the equation. It is essential to work on changing consumption patterns and ways of promoting more efficient transportation, focusing on a more holistic approach to enhance system efficiency. In this regard, it would be important for the region to achieve better coordination between programmes to encourage efficiency and related objectives, such as reducing emissions (with local and global valuations of benefits), industry development and competitiveness, the security of energy supply, urban development, public transport and road infrastructure. The efficiency of the transport sector will not improve spontaneously, and governments have a critical role in formulating strategies and policies to drive the change.

[17] At least in many countries (Argentina, Brazil, Bolivia, Peru, Ecuador, Colombia, Paraguay, Venezuela, T&T) the abundance of energy creates the idea that a shortfall is not a challenge; in many others (Central America and the Caribbean) the population seems to have a "right to energy" that the government should provide. Entrepreneurs consider energy to be an input that should be there in some way, energy prices are in general low, not signaling a shortfall, etc.

[18] Horta 2010; ECLAC 2013; Carpio et al. 2014

[19] CEPAL. 2014. Eficiencia Energética y Movilidad en ALyC: Una hoja de ruta para la sostenibilidad.

A major barrier to the promotion of energy efficiency in transport is linked to the fact that the structures that are responsible for energy efficiency put the *focus primarily on the end uses of power, with limited coverage of the transport sector.*

No doubt the context of this sector, which is highly diversified in terms of modes and equipment and has various types of users and purposes, makes it even more challenging to promote energy efficiency.

While it has been noted that there are difficulties in implementing measures to promote energy efficiency in transport, the region has several programmes that are yielding encouraging results. For example, ECLAC (2014) mentions the following measures:

Programmes for engine inspection and driver training. These programmes usually target commercial vehicles such as buses and trucks, with the aim of assessing the operating conditions of the engine (usually diesel engines, checking the conditions of air/fuel mixture and emission of pollutants at different loading rates), in addition to informing drivers about how to drive safely and efficiently, thus highlighting their economic implications.

Some examples are:

- Brazil: Programme of Training and Information for Drivers (SEST / SENAT), yielding approximately 14% energy savings for every trained conductor; programmes for fuel saving in carriers (CONPET), with annual savings of 252 million litres of diesel (2012).
- Mexico: Project Clean Transportation (SEMARNAT), 26% saving in fuel consumption standards in 2013 in relation to base year 2008.

Programmes to promote efficient vehicle technologies. Programmes promoting the most efficient vehicle technologies can achieve results even with the low involvement of drivers. Moreover, these programmes are typically more expensive in terms of developing more efficient technologies and introducing them, which may require mechanisms of promotion and marketing, despite the tax regimes on vehicles that take such aspects into account.

Examples are vehicle labelling programmes and performance standards. The Latin American experience is still limited, but some countries have adopted vehicle labelling programmes, namely Brazil, Chile and Mexico. The mode of implementation is important in view of the scope of the programme. In Brazil, labelling reaches 55% of the sales of the automotive industry in the domestic market. According to the legislation, in the next five years all vehicles and models should be labelled in Brazil (a policy that has also been adopted in Chile). The Mexican labelling system closely follows the example of the U.S., being modelled on the latter's Corporate Average Fuel Economy (CAFE) regulatory standard.

Increased vehicle efficiency has its costs. In the case of the Mexican programme, it is estimated that the average price of vehicles may have increased by 4.7% following the commencement of Rule 163[20] regarding energy efficiency and fuel economy.

Taxation based on the adoption of efficient technologies. One measure may be to increase the tax burden on high-powered vehicles (which are usually less efficient). Efficiency can also be promoted by setting a tax structure with discounts based on compliance with performance targets. One of the examples is the Auto Innovate Programme that commenced in Brazil in May 2013. The goals defined

[20] Maximum level of CO_2 emissions in vehicles up to 3.857Kg, following similar rules in USA and Canada.

by this Programme are compatible with European targets for 2015 (130g CO_2/km), which Brazil adapted by taking into account differences in the cycle of driving, fuel, and road specifications.

There are also separate special programmes, such as the evaluation of the use of fairings and spoilers by trucks. Examples in this regard include vehicle labelling programmes and performance standards in Brazil, Chile and Mexico.

The lack of national laboratory systems and experts for the evaluation of motor vehicles does not support improvements in transport efficiency. Ongoing challenges[21] also exist with respect to the importation of second-hand vehicles to LAC countries.

To acquire an idea of the importance of moving forward in promoting energy efficiency in transport, the Latin American Energy Organisation (OLADE) carried out an assessment of the regional potential for promoting energy efficiency in this sector, simulating the adoption of a set of measures to promote energy efficiency by the year 2030. As a result of this exercise, it concluded that the introduction of efficient technologies and the increased use of innovative energy carriers, such as power and biofuels, in transport may induce a significant alteration of the energy matrix and reduce energy consumption by 102 Mtoe per year. This would translate into energy savings of about 26% in relation to the business-as-usual scenario.

In conclusion, the report from ECLAC (2014) argues that although transport services and related infrastructure are crucial for the integration of the region into the global market, effective policies to reduce and manage energy consumption and emissions are mostly lacking in the region. In addition, the infrastructure of various modes of transport, including multi-modal transport, is not adequately developed. Often the decision to opt for a more energy-efficient mode of transport is hampered by significantly longer travel times, high costs, or a lack of quality and safety. This scenario is particularly the case for urban transport, in which the current focus on the mobility of passengers must not obstruct the view of urban commercial movements that are equally important and growing in number.

[21] Related to powerful interest groups that support the international trade in second-hand vehicles with the support of exporting countries like the US or Japan, representing a barrier to abolishing such practices.

3. Specific analysis at the regional and national levels

3.1. Regional initiatives

As mentioned earlier, one of the most important regional initiatives to highlight is creating a Base Indicators for Energy Efficiency (BIEE), launched by ECLAC in 2011. This was due to the realisation that in the LAC countries the quality of the statistics and performance indicators to quantify the results of national energy efficiency programmes is insufficient. The aim is to overcome this deficiency following the technical and political process, and the operating logic of the European Commission's ODYSSEE Programme, with the expectation that a set of indicators be generated to determine the evolution of national energy efficiency programmes, analyse the results and (as a consequence) takes the appropriate policy decisions. This project is supported by the German Agency for Cooperation (GIZ) and the technical support of the French Agency for Energy and the Environment (ADEME) in the framework of the International Partnership for Energy Efficiency Cooperation (IPEEC). The countries that took part in the BIEE from its beginning are Uruguay, Argentina, Chile, Brazil, Bolivia and Paraguay. Later other countries joined the programme, including Mexico, Costa Rica, Cuba, Guatemala, El Salvador, Panama, Peru, the Dominican Republic, Nicaragua, Honduras, Venezuela, Colombia and Ecuador.

The programme is being implemented through the coordination of a Directing Committee composed of ECLAC (as Chairman), ADEME, OLADE and participating countries. Each country participating in the programme has appointed a national coordinator (focal point), whose main tasks are: (i) to act as a national counterpart for all technical and administrative matters; (ii) to coordinate the work carried out by the national team (which is responsible for the technical work of gathering the information needed to calculate the indicators); (iii) to attend technical workshops and seminars; and (iv) to report on the programme's progress to the Directing Committee. In addition, in working closely with ECLAC and international consultants hired under the programme, each country defines a national team whose task it is to collect data on energy consumption (global and by sector), determine technical and economic factors, and carry out a detailed interpretation of the indicators and energy efficiency ratios used.

Moreover, a Technical Coordination Group (TCG) was created, consisting of ECLAC, ADEME, one European expert (specialist on ODYSSEE) and the National Coordinators. The role of the group is: (a) to develop appropriate methodologies for data collection, surveys and the calculation of indicators; (b) to carry out training; (c) to conduct an on-line service to assist the national teams; (d) to develop a common database, manage it and produce indicators; (e) to draw up a report on regional trends in energy efficiency; and (f) to prepare the technical documents for the workshop.

Within the framework of this project, ten technical workshops (general and sub-regional) and two technical tours (Latin American and European) were conducted. The goal is to conclude with a final seminar organised around four main themes: (i) findings, conclusions and recommendations on data collection, organisation and use of the database, as well as the calculation and interpretation of indicators and ratios on energy efficiency; (ii) the state of the art in the implementation of a permanent structure for the evaluation and comparison of energy efficiency, including established procedures, limitations and difficulties, institutional, human and financial resources required, etc.; (iii) terms of reference for cross-country comparisons to be carried out successively; and (iv) the operational and

financing scheme for the BIEE programme in future years.

Since 2011 OLADE has been organising a public–private non-profit initiative called the Latin American and Caribbean Network for Energy Efficiency (LAC-EE Network). Its aim is to contribute to the development of energy efficiency in the region by facilitating the exchange and dissemination of technical, legal and regulatory information between institutions and interested professionals. The specific objectives of the LAC-EE Network are to become a permanent forum for the discussion and exchange of experiences, the promotion of national policies for energy efficiency improvement, and the dissemination of lessons learned and the experiences gathered in the application of technologies. Its organisation consists of a management committee, with representatives from participating countries and sponsors, and an executive director. Its headquarters are located in the offices of the Permanent Secretariat of OLADE, in Quito, Ecuador.

Twenty-six countries participate in the network (nineteen are from LAC), and among the participants are government authorities and officials, business executives and officials, and representatives of academia. The network maintains a discussion group, where almost daily experiences are exchanged on national laws and energy efficiency programmes, applications of specific technologies, standards and specialised publications, among other things, in LAC. Currently the discussion group has several hundred registered members who participate regularly, proving that there was a need for a tool with such features. The LAC-EE Network is also responsible for the publication of a bi-monthly newsletter, garnered from those published on the website of the network or circulated in the discussion group.

Another regional initiative incorporating the issue of energy efficiency is the Energy and Climate Partnership of the Americas (ECPA). The ECPA was established in 2009 at the behest of the United States and is coordinated by the Organisation of American States (OAS). It includes a Working Group on Energy Efficiency that aims to provide regulatory, technical and policy-related collaboration and to support the development of frameworks, projects and information campaigns on energy efficiency and energy savings. Led by Mexico, this group provides information and tools to promote energy efficiency and energy savings in the region in the following areas:

- Regulatory and policy frameworks
- Certification of equipment
- Optimal practices at the local, state and national levels
- Design and implementation of programmes
- Creation of knowledge capacities and institutional strengthening
- Standards and labelling
- Business models for ESCOs
- Raising public awareness
- Providing information about funding sources for energy efficiency and energy saving, including multilateral development banks, the private sector and others

These cooperative activities envisage the creation of skills through workshops and the exchange of information and experiences with other regional initiatives on energy efficiency. In addition to providing assistance, the working group will also invite LAC countries, with positive models and experience in these areas, to share their best practices and experiences to develop regional partnerships that promote energy efficiency.

There are also activities at the sub-regional level, meaning a group of countries or an area like Central America.

Among them are:

- The Caribbean Community (CARICOM) Energy Programme, with a focus on regional policy coordination, strategy development and implementation.
- The Caribbean Sustainable Energy Programme, an EU-funded Initiative to facilitate the adoption of energy policies in Antigua and Barbuda, Dominica, the Bahamas, Grenada, St. Kitts and Nevis, St. Lucia, and St. Vincent and the Grenadines. In line with the CARICOM Energy Programme.
- 4E Programme for Renewable Energy and Energy Efficiency in Central America. A GIZ-funded programme to enhance the capacity-building of stakeholders and institutions in order to encourage the implementation of renewable energy and energy efficiency projects. A good source of information on energy efficiency in the region.
- The Regional Programme in Energy Efficiency for Industrial and Commercial Sectors in Central America (PEER) is implemented by the United Nations Development Programme (UNDP) and funded by the GEF.

While it is not the objective of this report to make an inventory of all the regional initiatives, it is important to demonstrate the level of activity in the region.

3.2. National initiatives

The key aim of the report is to identify and select countries that could be targeted for external support. To achieve this objective, a preliminary set of criteria are proposed to help determine priorities and opportunities for support according to the terms of reference.[22] The selection of countries to be analysed in greater depth and highlighted in the report was the result of various considerations, including: i) a desk-top review of information, programmes and actions put in place; ii) direct contact with energy efficiency authorities; and iii) government interest, including the responses received from a survey circulated to all LAC energy efficiency authorities. The efforts outlined resulted in an overview of some of the country cases presented below.

Initial sifting led to Brazil, Mexico and Argentina being excluded from further analysis. Brazil and Mexico were excluded because they have consolidated institutional structures for energy efficiency, a stable legal framework, financing mechanisms and an important history of successful initiatives having been implemented[23]. As for Argentina, although it was not possible to identify clear priorities for energy efficiency policies, the country has national capacities and an institutional structure that could make it part of this group.

The LAC countries included and described in this section offer examples of different levels of the development of energy efficiency policies. The country overviews presented below are structured around the following thematic blocks: i) examples of successful initiatives; ii) initiatives underway; iii) identified barriers; and iv) planned initiatives. This information can help communicate to governments and highlight to donors where targeted support for energy efficiency improvements is required.

Therefore, given this goal, this chapter does not aim to provide a compendium or inventory of all the policies in all the countries of the region, but rather to present certain examples of policies and strategies, as well as highlight areas of potential support for energy efficiency improvements based on the insights provided by the energy efficiency authorities.

[22] Component four of the report will develop the criteria analysis.

[23] ECLAC 2013

Bolivia

Examples of successful initiatives

One of the most emblematic programmes, measured by its impact on society, was the replacement of incandescent bulbs with CFLs. In the first stage (2008-2009) nine million incandescent light bulbs were replaced, generating savings in peak hours of between 92 and 100 MW. In the second phase (2011-2012), which involved the purchase of ten million efficient light-bulbs, the saving was estimated at 82 MW during peak hours.

Initiatives underway

The Bolivian Network for Energy Efficiency is a non-profit public–private enterprise, created in 2013 with the aim of contributing to the development of energy efficiency in Bolivia by facilitating the exchange and dissemination of technical, legal and regulatory information amongst institutions and professionals. It also supports the identification of sources of finance and contributes to monitoring capabilities. This network is based in the offices of the Ministry of Hydrocarbons and Energy, Deputy Ministry of Energy Development (La Paz). Its member institutions include the Bolivian Chamber of Hydrocarbons, GAS TRANSBOLIVIANO SA, IBMETRO, the National Committee for Load Dispatch and the Municipal Government of Tarija. Its website[24] provides information relating to the various activities that are taking place in the field of energy efficiency.

The overall objectives of the Programme for Efficient Offices in the Public Sector is the promotion and implementation of energy efficiency measures and savings in state offices, showing the energy, economic and environmental benefits of its application. Specific objectives include training staff in the proper management of equipment, promoting the use of equipment with energy labelling, and adapting infrastructure, lighting levels and ventilation to passive construction standards.

The general objectives of the Programme for Energy Audit on Buildings is the auditing and labelling of constructions in the residential, commercial and industrial sectors, in accordance with the energy efficiency values of lighting, insulation and ventilation equipment. The specific objectives are to identify the efficiency of the installed equipment and the existing infrastructure (thermal insulation, solar orientation, type of construction material, age, etc.) and define strategies to optimize the fuel and power supply, and water consumption.

The Appliance Labelling Programme sets out to label gas and electrical equipment (domestic and imported) in order to provide information to consumers on the final costs in terms of its useful lifetime. The specific objectives are to develop technical standards for labelling, increase the testing capabilities of laboratories, develop and implement information campaigns, and implement a self-financing mechanism for the national labelling system.

The Efficient Self-Transport Programme was created to improve the energy efficiency of the rural and urban automobile fleet through the application of specific measures of awareness and control. In particular, the programme seeks to develop and disseminate training programmes in efficient driving techniques, develop energy labelling regulations for vehicles and promote the use of mass transport.

The first stage of the development of the Strategic Plan for Energy Saving and Efficiency (PAEE) has

[24] www.red-ee.hidrocarburos.gob.bo

concluded. Among the projects being implemented are:

- Capacity development and reinforcement
- Implementation of a programme for information and increasing awareness in all consumption sectors
- New regulatory framework for government purchasing processes (energy efficiency appliances in administrative areas)
- Strategic energy efficiency plan for priority sectors: residential, transport and industry.
- Creation of an Energy Efficiency Agency
- Creation of a National Network on Energy Efficiency
- Improving energy efficiency in public utilities

Barriers identified

- Missing or outdated energy efficiency rules and regulations
- A lack of economic incentive mechanisms for energy efficiency measures
- Significant fuel subsidies
- A lack of fiscal and logistical norms for imports that take into account the energy efficiency of the equipment
- A lack of proper coordination between all sectors involved in the subject
- A lack of specialised technical skills in the area
- A lack of adequate data and statistical information

Planned initiatives

The second phase of PAEE sets out to pursue the following areas:

- Strengthening governance and capacity-building
- Implementing a Database of Energy Efficiency Indicators (BIEE)
- Implementing a Useful Energy Balance (BEU)
- Implementing the Bolivian Energy Efficiency Fund
- Projecting an Energy Efficiency Act
- Developing a proposal for the implementation of an Energy Efficiency Bolivian Agency

Chile

Examples of successful initiatives

In 2005-2010, under the National Energy Efficiency Program (NEEP), various projects were implemented in the areas of industry and mining, transportation and the commercial, residential and public sectors. For example, mass information campaigns and the replacement of incandescent bulbs with CFLs have been successfully implemented. Also, projects for energy efficiency labelling were promoted, funding was approved for conducting energy audits for SMEs, and subsidy mechanisms for thermal reconditioning of existing homes were implemented. Two important milestones of that period were the creation of the Chilean Energy Efficiency Agency and the development of a National Plan of Action for Energy Efficiency (PNAEE).

In 2010, after the creation of the Ministry of Energy, the duties of the NEEP were delegated to the Division of Energy Efficiency (DEE) of the Ministry of Energy (design and development of public policies) and the Chilean Energy Efficiency Agency (implementation of the programme entailed by these policies). In recent years, the DEE has designed and developed policies related to the labelling of household appliances (mandatory), of light vehicles (mandatory), and of housing (voluntary). Regarding the latter, the General Ordinance of Urbanism and Constructions is being modified to raise the thermal requirements for new homes. Work was also done on developing the regulation on public lighting for vehicle traffic routes and determining the standards for street lighting.

As for industry and mining, working groups within the productive sectors were established to promote energy efficiency. The objective was agreement on an action plan, the dissemination of knowledge and information among stakeholders and the achievement of compromises in the implementation of actions.

Energy efficiency has also been incorporated into the educational curriculum.

In the period 2010-2014, the Chilean Energy Efficiency Agency carried out studies of energy end-use and energy conservation practices in the residential, industrial and mining sectors, as well as in health-care facilities. The Programme for the Promotion of Cogeneration was established in 2012, with the aim of implementing cogeneration projects and building national capacities for the development of such technologies.

Many studies have shown that the best opportunities for energy efficiency measures are to be found in the residential sector, large commercial areas, and especially in energy-intensive industrial and mining branches.[25]

Initiatives underway

In 2013, the Action Plan for Energy Efficiency was presented, aiming to reach a 12% reduction in the energy demand projected for 2020. Under the plan being developed, actions are expected to take place in various sectors, including:

- Industrial and mining sectors: implementation of energy management systems based on ISO 50001 standards

[25] PRIEN "Base Study for the elaboration of an Energy Efficiency Plan 2010-2020". International Energy Agency reccommendations as a result of the assessment of energy policies in 2009. Advisory Commission on Power Development recommendations and suggestions of the Congress Citizen Commission for Energy Policy.

- Transport sector: implementation of incentives to purchase efficient vehicles through the promotion of energy efficiency standards and information mechanisms to develop a modern, energy-efficient vehicle fleet
- Building sector: improvement of power quality of the outer envelope and equipment in buildings without energy efficiency standards
- Expansion of the labelling scheme to cover products that use water and gas, such as washing machines, heaters, stoves, boilers, etc.; and establishment of Minimum Energy Performance Standards for various products in the country
- Firewood: improving the standard of quality in the marketing and consumption of firewood, particularly through projects that aim to decrease its moisture content to increase the use of heat energy content
- Transversal measures: the creation of an energy efficiency label that will identify and reward the leading companies nationwide in terms of their levels of energy efficiency.

The Ministry of Energy is also working on the design of financial mechanisms for easy access (soft loans, preferential rates, subsidies) for energy efficiency projects.

Currently, among other things, the Chilean Energy Efficiency Agency is conducting a study of energy end-use and the energy conservation curve for the passenger transport sector, as well as developing specialised technical assistance to carry out general energy surveys, energy audits and draft bills of investment in energy efficiency.

Another initiative is the "Energy Efficiency Label", established to identify and recognize companies that implement and invest in energy efficiency measures. In 2013, 40 companies were awarded the label in the transport, industry, mining, commerce, construction and services sectors.

Barriers identified

- *Information and education*. Despite the efforts made, there is still a lack of general information on the benefits of energy efficiency.
- *Financial*. Difficult access to credits. To foster energy efficiency at a productive level, accessible financing mechanisms are required (soft loans, preferential rates, subsidies, etc.). As the local banking sector has not incorporated the concept, there are no financial evaluations of energy efficiency projects.
- *Technical*. Evaluation of the results of energy efficiency requires trained professionals in the measurement and verification of results. This is an area where we need to strengthen capacities and, where possible, standardize knowledge in the sense of having internationally validated methodologies that can be applied locally. Another technical barrier is related to inefficiency or the lack of measurement instrumentation in the critical areas of energy consumption, limiting the ability to assess the benefits of introducing more efficient technologies.
- *Laboratories for testing*. Technology moves quickly; in this sense, tools must be developed to prevent the entry of poor quality products and to provide reliable information to users. In Chile there are testing laboratories. Adopting international test methods and harmonising performance standards and labels could remove trade barriers and contribute to reduced testing and compliance costs in the region.[26]
- *Market size*. Despite the efforts of the ESCOs, the market has not yet been consolidated. Market sizes, and a lack of stakeholders to generate economies of scale, are some of the reasons for this underdevelopment.

[26] This is an issue that should be considered across the region. The present report returns to this topic later on.

Planned initiatives

- Designing an Energy Efficiency Law to transform energy efficiency into a departmental or provincial policy, rather than have it remain a national government policy.[27]
- Implementation of a programme to improve street lighting, with the planned replacement of 200,000 fixtures and the backing of the Energy Efficiency Action Plan, setting a goal of energy savings of 20% by 2025.

Colombia

Examples of successful initiatives

In 2001, Law 697 was passed to encourage the rational and efficient use of energy and promote the use of alternative energies. This Law gives the Ministry of Mines and Energy (MME) the responsibility for promoting, organising and ensuring the development and monitoring of programmes for the rational and efficient use of energy, as well as creating the Programme for the Rational and Efficient Use of Energy (PROURE). Decree 3683/2003 regulates this law.

Resolution 18-0919 / 2010 of MME established an Indicative Action Plan 2010-2015 for PROURE. Colombian technical standard NTC-ISO 50001 was adopted in June 2011, with the aim of implementing energy management systems, which includes aspects of energy efficiency.

Law 1715, also known as the "Renewable Energies and Efficient Energy Management Law", was approved in May 2014. Article 10 establishes a Non-Conventional Energy and Efficient Energy Management Fund (FENOGE). Chapter V is devoted to the development and promotion of efficient energy management.

Initiatives underway

In its Article 6, the 18-0919 / 2010 resolution of the MME proposes specific targets for energy efficiency (energy savings in percentage terms) to be attained by the end of 2015, both nationally (15%) and by sector, namely residential (8%), industrial (3%), commercial and public services (4%), and transportation and other (2%), in comparison with a BAU scenario.

When it comes to the residential sector, these savings would come particularly from replacing four million domestic refrigerators with more efficient ones in the lower income strata and the replacement of 32 million incandescent bulbs with high luminous efficiency bulbs, also among the poorest population.

In PROURE 2010-2015, ten strategic sub-programmes are proposed, among which we can highlight institutional strengthening (the creation of a National Energy Efficiency Agency will be considered), the design and development of financial mechanisms to enable energy efficiency projects, and the incorporation of energy efficiency-related topics into formal education.

Among the actions that are under way, we can highlight the subsector energy characterisations, which will produce their final results in the residential and commercial sectors, and in about 50% of industry.

[27] Energy Efficiency Agenda, May 2014.

Barriers identified

- The lack of easily accessible funds.
- The absence of an entity responsible for energy efficiency issues. The institutional structure of the energy sector is neither designed for nor focused on energy efficiency.
- Although numerous guidelines are available, concrete progress has been limited in realizing the existing energy efficiency potential and in implementing energy-saving measures, projects and investments.
- The lack of incentives for creating an ESCO market. Limiting access to ESCO financing due to the lack of credit histories and the need for real guarantees is an important barrier to the development of such enterprises.

Planned initiatives

- Implementation of Law 1715 regulation.
- Preparation of PROURE 2016-2020.

Costa Rica

Examples of successful initiatives

Costa Rica became the first country in Central America to enact a law for energy efficiency back in 1994. Law No. 7447 (Rational Use of Energy Law) was enacted with the objective of consolidating state participation in the promotion of rational energy use. This Law attempts to establish mechanisms to promote energy efficiency by taking environmental protection into account. The procedures for the application of Law 7447 were published in 1996 through Decree No. 25584/24.10.96.

Financial incentives in the form of tax exemptions are given to electrical equipment that is considered important in promoting rational energy use. Article 38 of Law 7447 created a list of energy-efficient electrical equipment that would be exempted from import duties. However, Article 17 of Decree Law 8114 of 2001 partially revoked Article 38 of Law 7447, which resulted in the elimination of tax exemptions for energy-efficient equipment. In 2010, Law 8829 published a new list of energy-efficient electrical equipment that would be exempt from duties and taxes.

Since the 1990s, the electric utilities in Costa Rica have introduced programmes to promote the use of CFLs in the country. In 1996, the Costa Rican Institute of Energy (ICE) and the National Power and Lighting Company (CNFL)[28] used their own funds for the implementation of programmes to reduce power consumption and peak load demand. The objective of the programmes was to increase household awareness of the benefits of CFLs, reduce residential electricity consumption and peak load demand, and help foster a market for CFLs in the country. They introduced CFLs into the residential sector by distributing lamps to customers, with the cost of the lamps being recovered through the energy bill. In 2008, ICE launched the “three for the price of two” CFLs promotional campaign. The objective was to achieve a reduction of 30MW in energy demand in the National Electrical System (SEN) and to avoid investment of approximately USD 30 million in new power plants over the useful life of this kind of lamp. This programme was one of the most successful CFL distribution projects in Costa Rica. The ICE followed a strategy whereby CFL distributors were required to supply lamps that had been tested in the ICE’s laboratory to ensure compliance with the Costa Rican CFL standard before they were distributed to the public. CFL distributors were exempted from paying for the laboratory tests, thus motivating them to participate in the testing process, and the Costa

[28] A public utility that distributes electrical energy in the country's most densely populated area, the Greater Metropolitan Area.

Rican public was provided with a certified product at a discount, thus contributing to the overall success of the programme. The project included a publicity campaign on the subject of lighting, as well as on saving energy. In 2010, CNFL launched a campaign to provide free CFLs to households, which resulted in the distribution of over 700,000 lamps.

To promote efficient lighting in public-sector buildings, CNFL has been conducting on-site assessments of lighting in public-sector buildings and offices, estimating the potential savings to the public-sector organisation from the introduction of efficient lighting. Following these assessments, formal agreements are signed between CNFL and the corresponding public-sector organisations on the amount of investment required to introduce efficient lighting. An external entity contracted by CNFL replaces the inefficient lighting systems, and the costs are recovered over time by CNFL through the monthly power invoices.

As part of its energy efficiency focus, MINAE launched a programme to replace the mercury lamps used for public lighting with high-pressure sodium vapour lamps. Over 20,000 replacements have been made within the capital region and surrounding areas.

Costa Rica has launched energy efficiency campaigns through print and electronic media to promote energy efficiency among its citizens. These campaigns have focused on promoting the efficient use of power and fuels. Additionally, the Ministry for Education is tasked with introducing the subject of energy efficiency in primary and secondary schools.

Initiatives underway

A pilot programme for the introduction of LED lamps is currently underway with the Empresa de Servicios Públicos de Heredia ("ESPH"), a utility company based in Heredia, Costa Rica, for the installation of 19,000 of its LED streetlights to replace existing lighting in ESPH's territory.[29]

Institute of Technical Norms of Costa Rica (INTECO) is a private non-profit organisation created in 1987, later officially recognized as the nation's standards agency. In the area of energy efficiency, INTECO has published fifteen standards covering CFLs, commercial refrigeration, residential refrigeration and air conditioners. INTECO sets the minimum standards for energy efficiency and determines the efficiency rating of a product based on the information it receives from ICE's testing laboratory. ICE developed its own seal-of-approval label called **enerICE**. This label is currently only found on fluorescent lights. The label uses a star system to rate the energy efficiency of appliances, using the standards for energy efficiency generated by INTECO.

In 2009 Costa Rica restarted an urban train service between San Pedro and Pavas, San José and Heredia, and Cartago and San José. The train services are being offered at competitive prices and at greater frequencies during peak travel in the morning and evening. It is estimated that over a million passengers were transported by the train system in 2010[30]. The urban transportation service is a good step towards encouraging people to use mass transit services, which contributes to reducing congestion on the roads.

Costa Rica's Chamber of Industry (CICR) is active in the areas of energy efficiency, as its members see energy efficiency as a tool to combat the rising costs of power in Costa Rica. In order to equip professionals from the Costa Rican industry with knowledge of the latest advances in energy efficiency,

[29] ESPH Memory 2014.

[30] MINAE, 2013

CICR, in cooperation with GIZ, has created the "Energy Administrator" training programme, aimed at widening understanding of the technologies and methodologies that can be used to execute energy efficiency programmes in industry.

A revision of Law 8829 is currently at the public discussion stage, and a revised law is expected to be published in the near future.

Barriers identified

- The Rational Use of Energy Law (dating from 1994) needs to be revised and updated. Some parts of the Law have not been implemented as originally intended. A 2011 report by MINAE's Energy Sector Directorate (DSE) states that MINAE does not have sufficient resources to undertake the administrative tasks required to implement the monitoring and verification activities stipulated in the Law. The report also suggests a revision of Law 7447 to reflect operational realities better.
- The standards developed by INTECO are voluntary in nature and non-binding. This poses a problem, as there is no incentive for importers and distributors to comply with these standards.

Planned initiatives

- In 2010 a memorandum of understanding was signed between the US Department of Energy (DOE) and the Costa Rican Ministry of Energy, along with other Costa Rican entities, in order to create a regional Energy Efficiency Centre. The Centre will be located at the University of Costa Rica and will work in cooperation with many other government agencies to expand local knowledge of energy efficiency topics and provide training and other services. Implementation is still pending.
- As of June 2013, an extension of the *energICE* label for refrigerators was under development by INTECO and ICE.

Dominican Republic

Examples of successful initiatives

The main successful initiatives are related to energy audits in government, SMEs and industry organisations and an outreach Programme for Energy Efficiency, under the National Programme for Saving and the Rational Use of Energy. Since the programme's inception in 2012, around 120,000 people have been trained in the Rational Use of Energy and Energy Efficiency.

Complementary to this, a pilot Project on the Installation of a System for Monitoring Energy Consumption in Government Institutions and the project "Sun Bulbs", developed by the National Energy Commission (CNE) under the National Energy Efficiency Programme, were implemented. The latter included the installation of 2.5 litre transparent plastic bottles, filled with purified water, in the tin roofs of houses, reflecting the sunlight and lighting the interior of the residences, with more power than traditional bulbs. The bottles also act as skylights. In this way, energy saving measures is being extended to the most deprived communities in the country.

Finally a programme to change ten million incandescent bulbs with CFLs was successfully developed.

Initiatives underway

The Dominican Republic has an Action Plan on Energy Efficiency, one of the objectives of which is the development of actions and measures to produce results in terms of savings and the efficient use of energy in the home, transportation and the commercial, public and industrial sectors. To that end, it created an Institutional Committee for the Rational Use of Energy (CIURE), with a mandate to train its own staff and private-sector industries, disseminate the rational use of energy, develop a draft Energy Efficiency Bill (which has yet to be enacted), energy audits, etc.

The Energy Efficiency Project, currently under development by the Industry Association of the Dominican Republic with financial support from the Inter-American Development Bank (IDB), proposes to achieve energy savings of more than 20% of current consumption through the implementation of efficiency improvements in the production processes of ten industrial companies in the plastics subsector.

In addition, the following actions are underway:

- Implementation of the Energy Management System according to ISO 50001 in government institutions.
- Replacement of the existing lighting systems with LED systems in ten government institutions.
- Certification of companies that provide the Energy Efficiency Service (Resolution adopted in 12/2013, Process Development under the requirements of ISO 9001).
- Technical assistance project to promote energy efficiency in the Dominican Republic (Project JICA Japan International Coop. – CNE Nal Energy Commission).
- Installation of Banks of Trainers in water pumps for waterworks management companies.

Barriers identified

- A lack of financial policies and economic incentives
- The unavailability of resources to implement energy efficiency measures in public institutions; dependence on external funding
- Distrust of the business sector in energy efficiency project ventures

- Substantial energy theft, which involves almost 30% of households.[31]

Planned Initiatives

- Implementation of the Energy Efficiency Act
- Action Plan for Energy Efficiency in the Power Sector
- Labelling of household electrical equipment (lighting, refrigerators, air conditioning systems)
- Energy labelling for buildings

Ecuador

Examples of successful initiatives

Under the Programme for the Normalization and Labelling of Energy Efficiency in equipment, and as a result of the collaboration of the Ministry of Electricity and Renewable Energy (MEER) with the Ecuadorian Standardisation Institute (NIE), the country currently has fifteen mandatory Technical Regulations (RTEs) that establish minimum performance standards and energy efficiency labelling for household electrical equipment such as CFLs, refrigerators, air conditioners, washing machines, dryers, televisions, fans, water heaters, electric ovens and microwave ovens. There are also technical standards for the energy efficiency of voluntary compliance, e.g., for buildings, solar collectors for water heating systems for sanitary use, and induction cookers for domestic use.

Together with the Committee for Foreign Trade (COMEX), MEER promoted the adoption of resolutions for the promotion of energy efficiency, such as tariff differentiation (0% ad valorem) in highly efficient CFLs, and restrictions on imports of air-conditioning equipment of range B, C, D, E, F and G, among others.

In addition, the project Energy Efficiency in Industry, executed by MEER with support from the GEF and through the United Nations Organisation for Industrial Development (ONUDI), adopted standard NTE INEN ISO 50001 ("Energy Management Systems- Requirements with guidance for use").

The project to replace incandescent bulbs with CFLs is another example of a successful initiative that enabled the replacement of sixteen million bulbs in over two million households, small businesses and public institutions. The project was registered in 2011 under the Clean Development Mechanism (CDM).

Meanwhile, through the Efficient Street Lighting Project, 65,000 mercury vapour lamps were replaced by sodium vapour and induction lamps.

Initiatives underway

To date, under the Programme for Renewal of Equipment with Inefficient Energy Use (Inefficient Refrigerators Replacement Project Plan, or "Renova Plan"), about 40,000 refrigerators that were at least ten years old were replaced with new and efficient nationally manufactured equipment. The goal is to replace 330,000 units by 2017.

Another initiative is the development of the National Programme for Efficient Cooking (Project on migration from LPG to electricity for cooking). The Programme has implemented an initial pilot project to determine the economic, social and technical impact of partially substituting LPG for cooking

[31] Dominican Republic, Comision Nacional de Electricidad-2014.

through the free delivery of induction cooking systems (two induction cookers and a set of pots) to households who voluntarily agreed to accept them.

In the industrial sector, an energy efficiency programme is being carried out that seeks to strengthen local technical skills in the areas of implementation of Management of Energy Systems, Optimisation of Systems, the analysis of the economic viability of energy efficiency projects, and in giving workshops to Ecuadorian industry to encourage them to opt for policies of low power consumption. It has the support of the GEF through ONUDI.

A study of energy demand by sector and end-use is under way, with the aim of determining energy consumption balances nationwide in the industrial, commercial and residential sectors, as well as energy use growth trends by sector.

Barriers identified

- There is no available infrastructure that can certify the energy quality required for electrical equipment, whether domestic or imported.
- Consumers show a low level of acceptance of the adoption of efficient equipment as a first alternative.
- The cost of energy (especially fuel) is usually not very significant for end-users, which discourages investments in energy efficiency. Subsidies for power and fuel are an important obstacle to the promotion and implementation of energy efficiency programmes.
- Regarding the quantification of energy savings, measurements (monitoring, reporting and verification) were developed only under the project for the replacement of efficient bulbs, since this was registered as a Clean Development Mechanism under the Kyoto Protocol. For other initiatives, no indicators for measuring outcomes were established.

Planned initiatives

- The National Programme for Efficient Cooking aims to introduce three million induction cookers in the period 2015-2017. The implementation of this programme requires the entry into operation of hydropower generation: Paute Sopladora, Toachi-Pilatón, Minas-San Francisco and Coca Codo Sinclair, as well as the improvement of distribution systems.
- The formulation of a National Energy Efficiency Plan has been suggested.
- The transport sector is a priority because of its increasing contribution to the overall country's energy consumption. Promoting public transportation in cities and the development of alternative systems for cargo transport between cities are considered priorities.
- The industrial sector is also considered a priority, due to the expected increase in energy intensity arising from incentive policies and changes in the production matrix. These actions could be directed to mandating the implementation of ISO 50001 standard energy management systems in medium and large industries.

El Salvador

Examples of successful initiatives

The Energy Efficiency Project of El Salvador was mainly aimed at assisting the government, through the Ministry of Economy and in coordination with the National Energy Board, in the design, evaluation and implementation of a number of energy efficiency measures, including the implementation of pilot projects, identification of the necessary information, and preparing proposals for potential loans to carry out measures to improve energy efficiency.

The following measures were included in the provision of technical assistance:

- The development of energy audits in the industry, trade and service sectors
- Support to the implementation of demonstration projects
- Conducting studies to identify variables to accelerate the introduction of more efficient lighting systems in the residential sector, government buildings, hospitals, schools and public lighting
- Development of a feasibility study and proposal for a trust fund for the purchase of energy-efficient equipment and systems
- Analysis of energy consumption in the transport sector
- Estimating energy demand by mode, vehicle type, and fuel used.

Additional studies include the updating of previous studies on the demand curve and end-use energy to be applied in developing energy efficiency projects and the preparation of proposals for loans to finance energy efficiency projects and strengthen the institutional framework.

In terms of information campaigns and the dissemination of good practices in the field of energy efficiency, CNE has carried out a significant set of activities. Thus, in the period 2009-2013, among others, the following documents were developed:

- Methodologies for energy efficiency
- Energy efficiency in public lighting
- Fascicles of best practices in energy efficiency
- Energy efficiency in hospitals
- Manuals on the efficient use of energy
- Tips for efficient energy use in the residential sector
- Guidelines for the efficient use of energy in the government administration, and
- Guidelines on special funding mechanisms for energy efficiency projects.

Initiatives underway

Under the Programme for Energy Efficiency in Latin America and the Caribbean (PALCEE), driven by OLADE and funded by the Austrian Cooperative for Development, the programme El Salvador Saves Energy emerged in 2010 as a proposal coordinated by the CNE to strengthen the country's institutional framework. Currently, a number of institutions participate in this project: Consumer Advocacy, OSARTEC, OSA, OSN, DICA, FONDEPRO, CONAMYPE, SIGET, CEL, Bandesal, UCA, UDB, NCPC, ASI, the Chamber of Commerce and Industry of El Salvador, the power distribution companies AES El Salvador and DELSUR, BCIE, German International Cooperation and USAID, all coordinated by the CNE. Since its creation, numerous actions have been carried out, including curriculum development, as well as technical standards for efficient equipment to improve the skills of professionals involved in the issue; the management of awareness campaigns for radio and television and other information media; a training programme for micro, small, and medium enterprises on the subject of energy efficiency; implementation of the National Award for Energy Efficiency; a study of efficient public lighting for El Salvador; and a review and implementation of technical regulations on energy efficiency.

The COEES are committees formed in public institutions in order to promote best practices for the efficient use of energy. More than ninety public institutions have established their respective committees. These committees are an outcome of the Energy Efficiency Project in El Salvador, an initiative supported by the IDB, and were then taken up and enhanced by the Project on Energy Efficiency in Public Buildings in El Salvador. The latter, in turn, was supported by the UNDP. This has provided

the training with which to strengthen technical skills. The efforts of these COEES allowed for the replacement of lighting and air-conditioning systems, among other equipment. Moreover, electric lighting audits, implemented with support from COEES in twenty institutions, demonstrated that a shift to more efficient technologies can generate a high potential for savings. In addition, training courses for the efficient driving of motor vehicles were developed.

The project with the aim of optimizing energy consumption in SMEs through the implementation of energy efficiency programmes was executed by the Foundation National Center for Cleaner Production in El Salvador (CNPML), with the financial support of the Organisation of American States (OAS).

With the support of GIZ, and under the GEF Project on Energy Efficiency in Public Buildings, a system was created that allows COEES to obtain a history of utility billing, construct an energy balance, and quantify the impact of energy efficiency measures. Currently, the system is used by 80% of the committees, and 93% of them have been trained.

In 2011, the CNE, with the support of UNDP and with financial support from GEF, launched the Energy Efficiency in Public Buildings Project (EEPB), which seeks to implement energy efficiency measures in public buildings with the aim of reducing emissions of greenhouse gases and mitigating the adverse effects of climate change. The challenge of this project was to address the technical, political and informational barriers through three strategies: (1) developing and implementing energy efficiency policies and an effective regulatory framework; (2) strengthening the technical capabilities for the integration of energy efficiency measures in public buildings; and (3) implementing a pilot energy efficiency programme in the Ministry of Health with the aim of identifying and developing important technological changes in public hospitals in order to reduce energy consumption and related greenhouse gases.

A specialised postgraduate degree in energy efficiency was created in collaboration with the Universidad Centro Americana José Simeon Canas. The degree is aimed at government officials and has the objective of strengthening their capacities to generate proposals, plans and feasible measures related to energy efficiency within their institutions. To date, 72 representatives of institutions have participated in the course.

With the support of the Normative Unit of Procurement and Contracts for Public Administration (UNAC), the first Manual of Purchases with Energy Efficiency Criteria was developed. This instrument will support the purchasing of efficient equipment in order to reduce energy consumption in public institutions. This document was included in the state's manual of procurement.

The Draft Law on Energy Efficiency has been prepared as the first body of legislation in the country that seeks systematically to create the conditions for implementing energy efficiency in all sectors of the economy. The CNE, with support from the IDB and GIZ, developed and drew up the Draft Law on Energy Efficiency, which, among other aims, seeks to:

- Set national targets for energy saving and efficiency as part of the National Energy Policy (PEN).
- Regulate mandatory compliance with the energy savings and efficiency plans for the public and private sectors.
- Promote the participation of potential investors in new technologies and efficiency savings and create consulting firms in energy efficiency.

The Law proposes to establish the CNE, through its Directorate for Energy Efficiency, as the executor and regulator of energy efficiency in the country. The formulation and implementation of action plans would be undertaken by an inter-agency committee, which would also create the National Energy Efficiency Plan (PLANE). This Plan will follow up actions in the public and private sectors, which are mandatory energy efficiency measures. The proposal was presented to the Legislative Assembly on March 31, 2014.

Barriers identified

- A lack of legal and political norms on the subject of energy efficiency in public buildings.
- Limited technical capacity on the part of the main actors responsible for the design and implementation of energy efficiency measures in public buildings.
- A lack of information on energy issues in the government sector in order to establish performance indicators in public buildings.
- A lack of technical standards for equipment and construction materials with energy efficiency criteria.
- A lack of documented experiences of implementing energy efficiency measures in government institutions.
- A lack of mechanisms to assess and monitor the impact of the implementation of energy efficiency measures.
- The existence of consumer subsidies for power and gas.
- Consumer behaviour, with decisions based on initial upfront costs, rather than considering efficiency and running costs.
- Difficulties in accessing credit funds for energy efficiency project financing: special credit lines to finance investments in energy efficiency are not consolidated in the capital market. In addition, usually companies prefer investments in projects with the potential for production growth to those with the goal of reducing costs.

Planned initiatives

- Adoption of the Law on Energy Efficiency.
- Final evaluation of results of the Project “Energy Efficiency in Public Buildings”, i.e. assessing the results of the project, and the relevance and sustainability of its products in contributing to the medium- and long-term effects, as well as drawing lessons and recommendations to improve the sustainability of the project’s benefits and, more generally, help improve the management of UNDP and GEF-IDB.

Guatemala

Examples of successful initiatives

In 2009, a Non-Reimbursable Technical Cooperation Agreement between the National Electrical Energy Commission (CNEE) and the IDB was signed, through the Sustainable Energy and Climate Change Initiative (SECCI), for the design and implementation of an Integrated Energy Efficiency Plan (PIEE). The Plan has the objective of reducing consumption and optimising energy use in Guatemala through the implementation of energy efficiency measures.

The financing of this cooperation was spent on consulting services, studies, pilot projects and workshops, seminars and training courses for capacity building and the training of specialists in energy efficiency. Some of the studies carried out included an incentive programme for energy efficiency, and definition and financing schemes under the Comprehensive Plan for Energy Efficiency.

The areas selected for the implementation of new efficient technologies were lighting, air condition-

ing and wood stoves.

These projects took the form of energy audits to determine the current status of the participating facilities and identify potential areas for energy savings. Energy measuring devices were installed and potential savings estimated. With the economic information on the (local) costs of the investments necessary for the implementation of solutions, two reports were produced containing estimates for both payback periods and returns on investments. Once the agreements between the beneficiaries and CNEE had been signed, they were implemented. In all cases the results were encouraging.

In terms of advocacy and dissemination activities, CNEE's elaboration of a document with simple energy-saving tips designed to inform users can be highlighted.

With regard to educational issues, in 2010 CNEE hired experts from the Mexican Trust for the Saving of Energy (FIDE) to train energy-related professionals in productive sectors.

Initiatives underway

The most important initiatives are the draft bill submitted to Congress, entitled: "Draft Energy Efficiency Law". Its most noteworthy components are the creation of the National Council for Energy Efficiency (CONEE) as the Competent Authority, consisting of public and private actors with the objective of developing an Energy Efficiency Integral Plan for the Rational and Efficient Use of Energy (PIEE) and promoting its implementation; the establishment of a National Energy Efficiency Fund (FODEE) to finance the programmes and projects on energy efficiency; a comprehensive plan of programmes and projects, which will include as beneficiaries industry, trade, service, public transport, and the municipal and residential sectors. From the point of view of supply, the aim is to promote the use of more efficient and cleaner fuels for generation and cogeneration in the industrial and public sectors. Other mechanisms to promote energy efficiency include the labelling of equipment, standardization, the certification of companies and technologies, laboratory accreditation and the establishment of certification bodies and the launch of the National Energy Efficiency Award.

Barriers identified

- A lack of adequate and sustainable institutional quality over time, which prevents energy efficiency efforts from being translated into concrete actions. Approval of the Energy Efficiency Act would be an important contribution to overcoming this barrier.
- A lack of the necessary financial resources to implement energy-saving measures, whether in the public or private sphere.
- A limited institutional framework for the effective implementation of approved technical standards.
- No established system for the safe disposal of inefficient equipment: without implementing an environmentally-responsible disposal system, it will not be possible to prevent reuse.
- Upon completion of a pilot project, there are no follow-up advisory measures targeting the recipient with respect to the choice of incorporating energy-efficient equipment into new installations.
- In many cases there are no previous indicators of production, so it is not possible to correlate consumption with production, which discourages investment in energy efficiency.

Planned initiatives

- Initial creation of the National Council for Energy Efficiency (CONEE) as the Competent Au-

thority, in the event that the legislative agenda does not permit immediate adoption of the Law on Energy Efficiency.

Guyana

Examples of successful initiatives

In 2012, the Government of Guyana set value-added tax (VAT) at zero, making the following products fully exempt from import duties: machinery and equipment for obtaining, generating and using energy from renewable energy sources, including solar panels, solar lamps, deep-cycle batteries, solar generators, solar water heaters, solar cookers, DC solar refrigerators, DC solar freezers, DC solar air conditioners, wind turbines, water turbines, power inverters, CFLs and light emitting diode (LED) lamps.

The Guyana Energy Agency (GEA) assisted the Office of the Prime Minister in the promotion and distribution of 507 solar cooking stoves, the construction and demonstration of five energy-efficient wood stoves and the installation of two bio-digesters in five communities under the *Energy Access at Community Level for Millennium Development Goals (MDG) Achievement in Hinterland Area Project,* a UNDP Project. The project's overall objective is to provide energy services, power or cleaner fuels to all hinterland villages in rural areas at the community level by 2015. GEA's engineers also assisted with the installation of solar PV systems and solar powered vaccine-storage freezers, which includes the capacity building and training of locals.

To conserve energy, GEA's engineers, with support from the Ministry of Public Works and Work Service Group (WSG), replaced a series of photocells in street lamps with the objective of removing some 2,000 defective photocells.

The Guyana Manufacturing Services Association (GMSA) and the IDB implemented an action with the objective of assisting local companies, especially in the manufacturing and service sectors, to make the most efficient use of their energy applications and simultaneously employ the most effective methods of energy conservation. Stakeholders were informed about the need to optimize fuel efficiency and energy consumption. The programme was started to determine the practices and measures needed for the adoption of energy efficiency activities within the local manufacturing and commercial sectors.

Several workshops and training activities were developed by GEA on a range of issues like innovative fiscal and regulatory incentives for energy efficiency and renewable energy initiatives to improve understanding of the energy efficient framework, policies and institutions of OECD countries, and to clarify policies and institutions that could effectively promote energy efficiency. In addition, brochures were developed with tips on saving energy in household electrical appliances, building designs, private vehicle use and lighting.

With the support of GIZ, ECLAC implemented a project entitled "Reducing the Carbon Footprint in the Caribbean through the Promotion of Energy Efficiency and the Use of Renewable Technologies". The project sought to identify the barriers and gaps that currently inhibit or prevent the development of fiscal and regulatory systems, and it is expected to provide greater incentives for the development of renewable energy and energy efficiency. A final report was subsequently submitted.

Initiatives underway

Over the last two years, GEA has been testing and analysing the potential for LED and induction street lights. As part of a demonstration project in 2013, GEA commenced the process to procure 40 LED street lamps. The project, which involves the replacement of 250 watt high pressure sodium (HPS) lamps with 60 watt LED lamps, will conserve energy, reduce energy costs, improve the quality of street lighting and provide an opportunity to assess the LED street lights. The GEA is working closely with the Street Light Division, Ministry of Public Works, to ensure that street lamps meet the appropriate standards. This venture will allow the Street Light Division, the GEA and other stakeholders to gain a deeper understanding of the benefits and implications of efficient lighting technologies.

The Guyana Manufacturing and Services Association (GMSA) undertook an IDB project intended to assist local companies in the manufacturing and service sector to make the most efficient use of their energy applications and simultaneously employ the most effective methods of energy conservation. The project was designed to address three distinct but interrelated components of energy management: energy conservation, energy consumption and alternative energy sources. Ultimately, the project is expected to significantly reduce energy expenditures generated from lighting equipment and accessories, heating and cooling appliances/equipment, motorized drives, and electronic and other major energy-consuming assets.

Barriers identified

- There are no regulations, standards or laws to promote efficiency
- The incentives in place are not sufficient
- Dissemination of information on the opportunities for energy efficiency improvements in society is expensive
- There is a lack of sufficient resources in society to make the transition to more energy-efficient domestic equipment and private vehicles, although there is recognition of the long-term benefits of such changes.

Planned initiatives

- To advise and make recommendations regarding any measures necessary to secure the efficient energy management and carry out research to ensure a more efficient use of energy.
- Energy assessments will be continued with the objective of having ten assessments conducted annually through to 2017 in the manufacturing and services sector.
- The importation and installation of solar heaters will be promoted for both residential and commercial use.
- An assessment will be conducted regarding the establishment of a vehicle tariff structure that suitably reflects renewable and efficient vehicle technologies.
- Energy efficiency standards and labelling schemes for household and commercial appliances and some types of equipment, such as motors, will be explored through an initial voluntary scheme that simultaneously provides guidance regarding consumer awareness of energy use and benchmarks for efficient appliance and equipment purchase.

Honduras

Examples of successful initiatives

The Programme for Energy Efficiency in the Industrial and Commercial Sectors (PESIC), started in 2005 and led by the Honduran Business Council for Sustainable Development (CEHDES), advocates the adoption of policies, energy efficiency-related capacity-building for actors in the public and private sectors, and the implementation of practices by the private sector. One of PESIC's fundamental tasks is to demonstrate the technical and economic feasibility of energy efficiency projects. The main tasks carried out under this programme were the establishment of the Project Financing Fund (FO-PESIC) and performance of seventeen energy audits, which involved the investment of US$ 1 million.

The Autonomous Generation and Rational Use of Electric Energy (GAUREE) have undertaken several studies. During the first stage, in 1997 and 1998, it developed a programme of more than three hundred energy audits, which produced the first results in the country on the potential savings from implementing energy efficiency measures. In its later stages, it carried out characterization studies of the power demand curve in major cities, as well as presenting a study on the impact of implementing the differential time rate in the curve and conducting a national education campaign, "Learning the Rational Use of Electric Power".

Dec. PCM-112-2007 eliminated the use of incandescent bulbs in the public sector from January, 2008. In addition, a programme for the replacement of four million incandescent bulbs with CFLs in the residential sector was developed during 2009.

The Honduran Council of Science and Technology (COHCIT), through the Honduran Standardisation Agency (OHN), is the agency responsible for coordinating different sectors of the country to develop standards. Currently, it has already published standards for the energy efficiency of CFLs and air conditioners. These standards specify the requirements for energy efficiency, including the ballasts classification, test methods and the characteristics of the energy efficiency label.

A strategic Plan for the Management and Conservation of Fuel and Power, which promotes the rational and efficient use of energy in the government sector, was implemented by Decree PCM-010/2012. It also approved the holding of an educational campaign targeting fuel saving, energy saving and driver education, and introduced a plan of differentiated tariffs.

Finally, education programmes in energy efficiency were introduced and developed in primary schools.

Initiatives underway

One of the main initiatives falls under the framework of the GAUREE project, including the electrification of rural areas with renewable energy, hydraulic demonstration projects involving multiple uses of water, reduction of losses in power distribution systems and improved demand curve.

The government is in the process of conducting energy audits in a number of government buildings. As a result of the audits, the gradual replacement of inefficient equipment and a reduction in energy consumption are expected. Complementing the audits at the government level, similar actions are being put in place in SMEs to increase efficiency and profitability in these companies.

An agreement has been drawn up between the Secretariat of Natural Resources and Environment (SERNA) and the Ministry of Education to implement training programmes on energy efficiency and alternative energy sources.

One programme, called “Green Hotels”, is in course of preparing studies and project profiles on new energy efficiency opportunities.

Finally, a Strategic Plan for Energy Efficiency 2015-2020 is in preparation.

Barriers identified

- Low awareness about energy efficiency opportunities on the part of both consumers and relevant government agencies; general culture and mentality, which are not used to saving energy
- Difficulties in formulating medium- and long-term policies
- Limited availability of funds and project financing for energy efficiency; dependence on external funding
- A lack of rules and regulations related to energy efficiency. When there are technical standards (as in the case of those approved under the IDB/MIF/INTECO Regional Project), the limited management capacity of public institutions affects implementation
- Existing standards are voluntary, and Honduras still needs to decide to establish mandatory standards
- The absence of public policies with a programmematic perspective to strengthen the governance of energy efficiency

Planned initiatives

- A new law to promote the Rational Use of Energy is to be elaborated, including as its main elements a body in charge of the rational use of energy, a fund to promote energy efficiency, implementation of standards, technical regulations, and equipment labelling, and tax incentives for imports of efficient equipment and technologies.
- The Pilot Project “Green Institutions” is aimed at achieving energy efficiency in public buildings, and private ones who voluntarily join the project.
- An Implementation Programme for Eco-burners, as a measure for the efficient use of firewood and charcoal.
- A National Campaign for the efficient use of energy, including information, demonstration, education and communication (advertising).

Nicaragua

Examples of successful initiatives

Under the programme “Development of Energy Efficiency in Nicaragua” (2007-2011), energy audits were conducted in major companies in the industry, trade and services sectors, as well as support tasks for the implementation of pilot projects. As part of the programme, in the rural sector a Stoves Project was developed, benefiting four thousand households in fourteen communities across the country.

Information in previous studies of the characterisation of the demand curve and energy end-use in the city of Managua has been examined to identify potential energy-saving options.

The result of specific actions were very positive, like the distribution of CFLs lamps in the residential sector, mostly for free or at a reduced price; the replacement of conventional lighting technologies

and the introduction of efficient air-conditioning units in government buildings; and a demonstration project for water heating with thermal solar energy in hospitals.

Initiatives underway

Until 2017, the Action Plan for Energy Efficiency (Strengthening the Legal Framework for Energy Efficiency) will be in force. The Plan seeks the establishment of procedures for conformity assessment of the implementation of the Nicaraguan Mandatory Technical Standards Energy Efficiency programme. In the short term, a draft bill and associated regulations are expected to be put forward. There is already a draft of a National Energy Efficiency Programme for the short-, medium- and long-term.

Capacities are being developed in the financial sector, and mechanisms are being sought to improve market flexibility, in order to provide accessible credit offers to end-users.

Partnerships with universities in the country are being developed to create technical skills, and alliances are being negotiated with suppliers to improve the information available to the user through labelling programmes and to develop educational campaigns for the general population.

Barriers identified

- There is still no awareness in the public sector of the benefits of implementing energy efficiency.
- It is necessary to strengthen the education system at all levels.
- High upfront costs for purchasing efficient technologies.
- A lack of knowledge on the part of local banks on evaluating energy efficiency projects.
- A lack of mechanisms to evaluate the externalities related to energy efficiency projects.
- A lack of funding for energy efficiency projects, in vulnerable sectors, to provide information, developing of training workshops and project implementation; and
- A lack of information to help characterise the current situation in the country.

Planned initiatives

- Residential sector: replacement of incandescent lamps with CFLs.
- Government buildings: replacement of conventional lighting with more efficient lighting.
- Public lighting: replacement of conventional streetlights with more efficient lights.
- Pilot projects: implementation of solar thermal systems for heating water in hospitals.
- Installation of refrigeration and air-conditioning systems powered by solar energy.
- Creating a Credit Fund to promote investments in energy efficiency, which suits the nature of the investments and the ability to pay based on the savings generated in lighting, air conditioning and motor power.
- Approval of an Energy Efficiency Act and its regulations.

Panama

Examples of successful initiatives

The National Secretariat of Energy (SNE) has implemented energy efficiency programmes in the departments and agencies of the Public Administration, resulting in savings of up to US$ 45 million in the period 2009-2014.

With the support of Mexico, in 2002 a study was carried out in order to identify the end-uses that contribute to potential energy savings per sector. From the results, we can highlight the potential of targeting air-conditioning in the residential, commercial and service sectors, and of refrigeration in the industrial sector. According to this study, energy savings of between 6% and 15% could be achieved by changing customs and habits, and energy savings of between 25% and 40% could be realized by implementing policies and programmes that encourage the replacement of inefficient equipment.

Since the beginning of the Regional Programme on Energy Efficiency (PEER) in Panama (2005/2011), annual savings of US$ 836,000 and 5,218 MWh per year were recorded for power consumption, as a result of an estimated initial investment of US$ 1.5 million.

Rules for Air Conditioning and Ventilation were implemented in 2010, including features of the design, operation and installation of such equipment.

Law 69, enacted in October 2012, establishes the general guidelines of the national policy for the Efficient Use of Energy (UREE) in the country. Executive Decree 398 of June 2013 regulates the Law. Among other measures, the legislation creates in each public institution an “Energy Committee” and its coordinator, the “Energy Manager”.

In April 2014 SNE held the first training programme directed at all energy managers and members of the Energy Committee of the public sector.

In the period 2010-2013, energy efficiency presentations and discussions were held in different schools in the country for students at primary, secondary and university levels, having reached more than 100,000 students nationwide.

Initiatives underway

The main initiatives include the establishment of a fund of US$ 10 million to finance energy efficiency projects (URRE Fund); an agreement between the International Finance Corporation (IFC) and the Government of Panama to design a new regulatory framework to promote eco-efficient construction, and reduce energy consumption and water in new buildings, called the “Green Construction Code”; the establishment of a Management Committee for Energy Efficiency Indices to set up a framework for indicators on energy efficiency; and the establishment of a process for granting incentives in social housing that incorporates energy efficiency measures.

Barriers identified

- Weak institutional experience in the promotion and development of projects for saving power.
- Insufficient funding to implement a nationwide programme.
- A lack of promotional and financial schemes for the development of energy efficiency projects.
- A lack of commercial banking experience in the financial structuring of investments in energy efficiency.
- Uncertainty about the technical and economic risks, which limits the supply and demand for equipment and services.
- Little knowledge about technologies and good practices associated with energy efficiency.
- The absence of a culture of energy efficiency.
- A lack of standardisation and labelling equipment.

Planned initiatives

Preliminary actions to develop a new National Energy Plan have commenced.

Paraguay

Examples of successful initiatives

One important step was the creation of the National Committee for Energy Efficiency (CNEE) in accordance with Executive Order Nº 6377/11, responsible for the preparation and implementation of the National Plan for the Efficient Use of Energy. This is coordinated by the Deputy Minister of Mines and Energy of the Ministry of Public Works and Communications.

The initial actions included the preparation and approval of standards for labelling, including general requirements, air conditioners, refrigerators, freezers and combined equipment.

An energy efficiency project developed by ANDE and financed by the IDB, which included hiring a consultant to conduct studies of the distribution system, control and reduction of losses, consumption profiles and potential energy saving, and the efficient use of power.

Initiatives underway

The main initiatives are the preparation of the National Plan for Energy Efficiency, development of standards for fluorescent lamps and the estimates of potential savings, in a joint cooperation between the Department of Mines and Energy and the National University of Asunción.

Barriers identified

- Low internal coordination of the energy sector authorities and productive chains, as well as between the energy sector and the rest of the economy.
- Insufficient disaggregated information by sectors, implying difficulties in identifying potential savings and, therefore, also in defining lines of action for energy efficiency measures.
- The lack of an institutional framework for the implementation of measures.
- Consumer ignorance of the existence of programmes for energy efficiency, combined with a culture of waste acquired by citizens due to the abundant availability of energy.
- A lack of funding for actions and efficiency plans.
- An inadequate subsidy policy, especially in the power sector, diluting the benefits of energy efficiency.

Planned initiatives

- The first axis of political-institutional actions includes the development of proposals for decrees, laws and regulations (among other legal instruments) to facilitate the implementation of the Plan and ensure the continuity and permanence of processes.
- The second axis will enable the development and implementation, in conjunction with public and private institutions, of actions related to education, awareness and the training of trainers for the efficient use of energy.
- The third axis, the development of Programmes Implementing Efficient Energy Use, will facilitate the prioritization or arrangements of the implementation of the programmes as defined and elaborated in the sectors identified.

- The fourth axis is the energy audits that will determine the efficiency with which energy is used in the various sub-sectors. It is necessary to know the current state of energy consumption before actions to combat waste in the sector can be developed.

Sustainability actions are the fifth axis; this is a fundamental element, since the instruments for monitoring and measuring the impact of actions could be evaluated in order to ensure their permanence. Another issue addressed by this item is the involvement of educational institutions (primary, secondary and university). This should be carried out gradually, with the inclusion of Conservation and Energy Efficiency in the curricula of educational programmes. In addition, this will allow the private sector to participate in energy efficiency projects through the creation of ESCOs, so to make sure that programmes are sustainable.

Uruguay

Examples of successful initiatives

The Energy Efficiency Project (2005-2012) was funded by a grant from GEF through the World Bank and also by the Public Utility (UTE) and the Ministry of Industry and Mines (MIEM). This nationwide project improved the understanding of energy efficiency across the economy. Upon completion of the project, nearly US$ 23 million had been invested, ten ESCOs were in operation, 250 actors had been trained in energy efficient practices, cumulative energy savings had been made amounting to 559 ktoe, 1.4 million tons of CO_2 had been saved, more than 45 national energy efficiency standards had been approved, and over two million CFLs had been delivered to the population under the "Full Lights" plan ("A todas luces").

Law No. 18,597 on the Efficient Use of Energy (2009) declared energy efficiency to be an issue of national interest and documented Rules for its Regulation and Promotion. This law created the Uruguayan Trust Savings and Energy Efficiency (FUDAEE), which aims to provide funding for technical assistance in energy efficiency, promote energy efficiency nationally, finance investment projects in energy efficiency, promote research and development in energy efficiency, and act as a contingency fund in the event of a crisis in the sector. Under Decree 86/2012, the FUDAEE is approved and its tasks and sources of material resources defined.

Decree 429/2009 fixed the evaluation in compliance with the Uruguayan Institute of Technical Standards (UNIT), the appropriate energy efficiency labelling. The Regulatory Unit of Energy and Water Services authorizes manufacturers and importers to use an energy efficiency label. There are specific regulations for certain products: CFLs, electric water heaters and household refrigerating electrical appliances.

The Directing Commission of the Energy and Water Regulatory body (URSEA), in its Resolution No. 181/009, created the Register of Certification Bodies (ROC), establishing the requirements to be met by those interested in being recognised as Certification Bodies in energy efficiency. To date the Technological Laboratory of Uruguay (LATU), UNIT and LSQA (a LATU and Quality Austria Association) have been recognised as a Certification Body.

Implementation of National Energy Efficiency Awards (editions 2009; 2010; 2011; 2012; 2013; 2014) in recognition of the efforts made at the national level by different companies and institutions.

Initiatives underway

The Energy Efficiency Trust (FEE; under restructuring) is a guarantee fund created to encourage companies and other energy users to develop energy efficiency projects. To this end, it has established a trust fund administered by the National Corporation for Development (NDC) within the framework of the National System of Guarantees and in accordance with the Financial Intermediaries Institutions (IIFs), being interested in developing these loan lines. The funds come from donations received by the MIEM Fund from the GEF, through the World Bank. Two lines are established: Technical Assistance Loans, and Loans for Investment Projects.

Financing from the Bank of the Oriental Republic of Uruguay (BROU) is concerned with care for the environment and sustainable development. BROU has adhered to the "Principles of Ecuador"[32] and has incorporated specific assistance to companies interested in consulting and implementing cleaner production mechanisms, amongst which Energy Efficiency Projects are being considered. The programme offers financial support for up to 70% of the investment for up to three years, including a six-month grace period and soft rates.

Benefits to industries that invest in energy efficiency: discounts on the power bill to industries that invest in energy efficiency have been in force since 1 July 2014. The benefit covers industries that have already implemented or are implementing these actions during 2013 and 2014. The proposed reward consists of a reduction in the invoice of the tariff component "energy rate" for six months, with a maximum per company of 15% of this rate per month. The discount will consider the annual reduction in power consumption each company has or expects to have as a result of implementing energy efficiency measures.

Regarding the drive for energy efficiency in transport, the activities are related to the promotion of efficient vehicles, new technologies and efficient driving habits. To this end, pilot tests are underway in electric cars and buses,; together with training programmes in efficient driving for professional drivers and the preparation of technical standards for the energy efficiency labelling of medium vehicles. Tax adjustments are also being considered that encourage the purchase of energy-efficient technologies and modes of transport.

Barriers identified

- The nationwide study of potential energy efficiency savings is out of date (estimated in 2006 and 2008)
- Difficulties in promoting actions due to conflicts of interest
- Low relative weight of energy costs for industries
- The existence of subsidies that discourage development of efficiency measures;
- In some cases, high investments are required
- A lack of capacity to boost efficiency in SMEs
- A lack of systematic monitoring of the measures implemented in private enterprises and even the public sector
- Building norms are defined by each municipal authority and do not include the requirements for energy efficiency
- A lack of national testing standards to assess the security and performance of new technologies for residential and street lighting
- Limited local capacity to test the energy efficiency of lighting and appliances. Agreements have been signed for the refurbishing of laboratories (lighting and electric water heaters). The laboratories are currently active

[32] Ecuador Principles Financial Institutions (EPFI), World Bank

- Low awareness and/or education of the public regarding labelling and energy efficiency in general.

Planned initiatives

- Agreement with UNIT to develop national testing standards to assess the security and performance of new technologies for residential and street lighting.
- Through the FEE, a non-refundable fund for developing energy audits will be introduced, which will cover up to two-thirds of the cost (up to USD 5,000).
- A National Energy Efficiency Plan is being developed.

3.3. Final remarks

Following this overview of the situation of energy efficiency in selected countries of the LAC region and a more in-depth review from information provided by energy efficiency authorities, some features can be identified that are common to most LAC countries. In addition, further analysis confirms and reinforces the main problems and failures described in Part 2 of this report.

One successful energy efficiency initiative, common to all countries and massive in scope, is the replacement of incandescent bulbs with CFLs. In general, such campaigns were supplemented by regulations that restricted the use of incandescent lamps, leading to their subsequent prohibition.

Another feature, common to several countries, is that the moments of greatest boost to energy efficiency occurred as a result of the need to respond to situations of energy crises or "stop and go" policies[33]. Generally in these situations, governments pointed to a strong commitment from the public sector to energy saving and efficiency measures.

Moreover, although with different levels of progress, all countries have taken action to implement the energy labelling of electrical and gas equipment. However, a major difficulty in implementing labelling programmes has been the lack of adequate testing laboratories.

A remarkable fact is that almost all countries are implementing or in the process of implementing national programmes for the short- and medium-term. However, it is also important to highlight that activities directed at the transport sector are mostly non-existent or at a very early stage (generally consisting of training in efficient driving techniques).

A major barrier to the development of energy efficiency activities has been the lack of adequate data and statistical information. Similarly, a deficit is evident in the methodologies for evaluating the results of energy efficiency programmes and projects. Efforts to overcome these shortcomings in most countries are limited to conducting studies of energy demand by sector and end-use energy and participating in creating the BIEEs.

From the institutional point of view, a number of countries already have an Energy Efficiency Act or are considering its adoption. Several countries are in the process of creating a National Energy Efficiency Agency.

[33] CAF 2012

Some LAC countries have fossil fuel subsidies,[34] and price subsidies on power are present in many of them[35].

A barrier that recurrently appears in reports on the state of affairs of energy efficiency in the countries of the region is related to the lack of easily available funds and mechanisms to support the delivery of energy efficiency projects. As a result, some countries are accessing finance independently or through international collaboration.

Another common feature among LAC countries is that practically no country has been able to consolidate a market for ESCOs.

As the case of Chile shows, barriers such as the high costs of laboratories and testing issues could be overcome. The adoption of international test methods and the harmonization of standards and labels could contribute to reduced testing and compliance costs in the region.[36]

Depending on what is described above in relation to the road travelled by a significant number of countries of the region in energy efficiency, and in order to select those that may be subject to technical assistance programmes, roughly two sets of countries can be identified.[37]

The first set would include countries like Chile, Colombia, Costa Rica, Ecuador, Panama and Uruguay, which have made concrete progress in institutional development, the legal framework and financing mechanisms for energy efficiency projects. They have implemented national efficiency programmes and some successful initiatives, but there still some way to go before energy efficiency reaches full maturity.

The second set would include countries such as Bolivia, the Dominican Republic, El Salvador, Guatemala, Guyana, Honduras, Nicaragua and Paraguay, countries in which energy efficiency is undeveloped. This lack of development can be expressed by the lack of adequate legal frameworks and institutional structures, the meagreness of budgets for energy efficiency (making them highly dependent on international cooperation) and the notorious gap in information and data-gathering. Nevertheless, in all of these countries energy efficiency is considered a priority that should be high on the national energy agenda.

[34] Fuel subsidies tend to be larger and more entrenched in oil-rich countries, where they are seen as a way of sharing resource wealth with the public, despite their benefits accruing mostly to richer households.
[35] IMF 2015

[36] This is an issue that should be considered across the region. The report comes back on this topic later on.

[37] Countries under analysis are those that show a positive position in face of the potential reception of support and/or that give a high priority to energy efficiency policies.

4. Criteria for country selection and potential technical assistance

As previously mentioned, the criterion that should prevail when deciding on potential external assistance is considered to be improving the situation of those countries that are in the worst conditions. However, this carries the risk that technical assistance may not obtain the expected results in accordance with SE4ALL objectives and targets.[38]

Consequently, the criteria should be screened to find the right combination of countries among those selected. This report shows that it is possible to find this mix of countries in the LAC region, where the degree of progress and development in the different dimensions and enabling conditions for the implementation of energy efficiency measures exist. Therefore it is possible to identify countries and suggest interventions that contribute to the improvement of energy policies in the countries with the least development, while also contributing to the SE4ALL energy efficiency objectives.

Some countries are not included in the following analysis. As mentioned earlier, Brazil and Mexico have comparatively well-developed policies and strategies, as well as the local capacity at all levels to design and put in place actions and measures[39]. Argentina is also included in this category as it has greater local capacity compared to other countries in the LAC region.

For this purpose, each of the criteria is surveyed, assessing the situation of countries that could be targeted for technical assistance and that they have shown the greatest interest in contributing to the SE4ALL goal of accelerating energy efficiency. This section considers the LAC countries in relation to the following criteria:

- Institutional issues
- Legal and regulatory frameworks
- Financing resources and mechanisms
- Scarcity of resources or funding
- Sectors or uses of significant magnitude and specific weight
- Milestones of structural changes in energy policy
- Potential technological niche development
- Replicating actions in other countries in the region
- Degree of progress and local capacity
- The lack of a favourable policy environment and an abundance of energy resources

Institutional issues. Below are listed the existence, or lack thereof, of an institutional structure in the area responsible for the definition and implementation of policies, and the degree of articulation between energy efficiency and energy policy.

[38] The target is double the global rate of improvement in energy efficiency by 2030.

[39] ECLAC 2013

Table 4.1 Institutional Issues

Country	Situation
Bolivia	There is a lack of institutional coordination among many energy public institutions, but the existence of a network to promote actions and measures in energy efficiency provides a good opportunity for intervention.
Chile	An Energy Agency for Energy Efficiency was created in 2010 and offers an excellent framework for actions.
Colombia	A PROURE programme under UPME Coordination is in place. There is a lack of coordination among public institutions. The Colombian Council of Energy Efficiency (private sector) was established in 2010. The creation of an Energy Efficiency Agency is currently being considered.
Costa Rica	The Ministry of Environment, Energy and Seas (MINAEM) is responsible for the strategy on energy efficiency.
Cuba	The National Office for the Rational Use of Energy (ONURE), created in 2012.
Dominican Republic	There is a programme on energy efficiency under the responsibility of the Energy National Commission.
Ecuador	The National Institute for Energy Efficiency and Renewable Energy (INER) was created in 2012 offering an adequate counterpart for programmes.
El Salvador	The Institutional Committee on Energy Efficiency is responsible for the implementation of actions and measures.
Guatemala	The National Council on Energy Efficiency is in the process of being created by law. It will be in charge of the energy efficiency plan.
Guyana	The Guyana Energy Agency is putting in place specific actions to promote energy efficiency.
Honduras	Responsibilities are distributed among different public organisations, although several energy efficiency programmes are in place.
Nicaragua	The Ministry of Energy and Mines is responsible for the Action Plan on Energy Efficiency.
Panama	The National Energy Secretary is in charge of energy efficiency policy.
Paraguay	The National Committee on Energy Efficiency is responsible for the Energy Efficiency Plan.
Peru	The Ministry of Energy and Mines is responsible for energy efficiency policy.
Uruguay	The National Energy Department is very active in energy efficiency policies and strategies.

From an analysis of the institutional situation, we can conclude that the countries that show the strongest position in terms of clear institutional responsibilities in the implementation of plans, programmes and initiatives are Chile, Costa Rica, Ecuador, the Dominican Republic and Uruguay. In these countries, creating an institutional framework for energy efficiency has been prioritized.

Improvements to the institutional capabilities and structures of many other countries, like Bolivia, Honduras and Colombia, require significant technical assistance. For example, in Colombia there are good, elaborate programmes that have encountered implementation barriers, due in some cases to institutional complexities.

Legal and regulatory frameworks. Several countries in the region have an Energy Efficiency Law, while others have managed with decrees or resolutions.

As a product of the survey process and of the evaluation of information from other sources, it has been possible to identify the existence of legal frameworks and their effectiveness in achieving results.

Table 4.2 Legal and Regulatory Frameworks

Country	Situation
Bolivia	As an objective of the energy policy, a new law on energy efficiency will be proposed.
Chile	A new law on energy efficiency is under consideration. The law proposes to define the energy efficiency policy as a part of the state policy (long-term objectives and implementation).
Colombia	Law (697) was introduced in 2001 with the objective of promoting energy efficiency and renewable energies. The legal regulation created the PROURE Programme in 2003. In 2014 a new law was approved (1715) to promote energy efficiency and renewable energies.
Costa Rica	Law 7447 on the Rational Use of Energy has been in place since 1994.
Cuba	Foreign Investment Law 118 (2014) includes some references to energy efficiency.
Dominican Republic	A law on energy efficiency is under consideration.
Ecuador	The Ecuador Normalisation Institute has fixed the technical norms for efficiency. ISO 50001 is in place in the country.
El Salvador	A projected law has been drawn up by the National Commission of Energy.
Guatemala	A projected law on energy efficiency is being considered by Congress.
Guyana	No references to law, only to the application of standards for equipment.
Honduras	A proposed law is under consideration by the government.
Nicaragua	A proposed law is under consideration by the government.
Panama	Law 69 (2012) established the general rules for the policy on energy efficiency.
Paraguay	No reference to a law on energy efficiency.
Peru	The Law of Energy Efficiency (2000) was adopted in 2007.
Uruguay	Law 18.597 on energy efficiency has been in force since 2008.

It can be seen that several countries have developed legal frameworks for Energy Efficiency and that many of them are in the process of doing so. Although the existence of a legal framework is not considered essential for the development of efficiency measures, the evidence shows that countries with legal frameworks have been more active in developing and implementing policies and strategies. This highlights the potential benefits of putting legal frameworks in place that are enforced in other countries in the region.

Financing resources and mechanisms. As already mentioned, the boundary is marked by the resources that are spent on energy efficiency activities (budgeted and not budgeted), and the existence of sustainable financing mechanisms for such activities. Funds to guarantee the sustainability of the programmes are the key issue in the implementation of such actions.

These are situations where the existence or creation of finance do not find a suitable assignment or cannot leverage other funds to maintain and deepen the initial actions. Reference is made to those countries that have indicated that they will create a fund, although no details are available.

Table 4.3 Financing Resources and Mechanisms

Country	Situation
Bolivia	A Bolivian Fund for Energy Efficiency is under consideration.
Chile	A guarantee fund for energy efficiency to leverage private funds exists, administered by the Energy Efficiency Agency.
Colombia	A fund for renewable and energy efficiency has been in place since May 2014 (law 1715) (FENOGE).
Costa Rica	There are some funds linked to regional programmes or cooperation.
El Salvador	The new law includes the creation of a trust fund.
Guatemala	A fund is planned, to fall within the framework of the new law.
Panama	A fund to finance energy efficiency is being considered.
Peru	The environmental fund managed by FONAM includes energy efficiency actions.
Uruguay	A trust fund to promote and finance energy efficiency projects (FUDAEE) was started in 2007.

Those countries that have implemented a funding mechanism or an institutionalised guarantee fund, managed by the appropriate authority, have advantages such as complementing, supporting and promoting efficiency projects. In this regard, Chile, Colombia and Uruguay offer a more favourable context as priority countries for technical assistance. The latter is of particular interest, since the fund created did not receive the requirements originally anticipated, which could be evidence that the existence of funding or resources is a necessary but not a sufficient condition to encourage actions.

Scarcity of resources or funding. This refers to the lack of adequate funding, linked to a lack of knowledge of the unique characteristics of energy efficiency projects by the commercial banks.

The analyses reveal that almost all countries have mentioned the lack of funding and the difficulties in involving commercial banks in energy efficiency projects. A country-by-country analysis does not seem necessary, since, as already mentioned, the lack of funding is transversely mentioned as a common problem. The lack of funding requires further analysis, as there is a heavy reliance on public funds and international cooperation, which generally have alternative purposes, but this has been a barrier to the implementation or acceleration of energy efficiency actions.

Accordingly, this is a criterion that would not allow us to select or prioritize countries, except in the case of giving priority to the most vulnerable and smallest countries in the region. Like many others, but even more deeply, they lack a developed capital market, a fact which clearly explains the lack of domestic financing.

Sectors or uses of significant magnitude and specific weight. This report proposes that those sectors or uses that, due to their own weight and the potential for savings, would merit specific support for energy efficiency should be considered when prioritizing country support.

Since it is expected that the actions are directed towards priorities that countries define (demand-driven actions), it is necessary to identify the sectors in which intervention is required, according to the responses received from countries, as a response to the pull included as an annex to this report (see Annex II).

As was already mentioned and reaffirmed in the responses received, the rebound effect has not been estimated in the countries of the region and has been ignored in most cases. In none of the cases has the rebound effect been estimated when identifying and quantifying the potential energy savings effects.

Table 4.4 Sectors or Uses of Significant Magnitude and Specific Weight

Country	Priority Sectors
Bolivia	Transport, Industry, Building (Residential and Commercial)
Chile	Mines, Industry, Building (Residential and Big Commercial activities: Shopping Centres)
Colombia	Industry (boilers and electric motors)
Costa Rica	Building (Residential and Commercial), Industry, Transport
Cuba	Sugar Industry
Dominican Republic	Sugar Industry, Industry, Building (Residential and Commercial), Transport
Ecuador	Building, Industry, Public Lighting
El Salvador	Industry (small), Building (Residential and Commercial), Public Sector
Guatemala	Building (Residential and Commercial)
Guyana	Public Lighting, Industry, Building (Commercial)
Honduras	Industry (specially medium and small), Building (including Public Sector), Power Supply (transmission and distribution), Public Lighting
Nicaragua	Building, Public Lighting, Public Transport, Electric Motors
Panama	Industry, Building (Residential and Commercial)
Paraguay[40]	Building
Peru	Building (Commercial, Residential and Public sector), Transport, Industry
Uruguay	Transport, Industry, Building, Public Lighting

The countries have concentrated their actions on a set of measures essentially including efficient lighting, the labelling of electrical and gas equipment, information and awareness, tax incentives, energy audits, pilot and demonstration projects, capacity building, the implementation of trusts, and measures of command and control.

The sectors identified reveal that the distribution of priorities is large across the countries, thus it would be inappropriate to set any criteria of transversally involving common sectors for all countries. However, a significant concentration is observed in industry and buildings. The low reference to transport always reveals the complexity involved in intervening in this sector.

Milestones of structural changes in energy policy. This dimension concerns recent milestones in a country's energy policy, involving major challenges that impact on the energy efficiency policy.

During the years 2000-2010 many LAC countries faced a change in public policy, greater government intervention in energy systems, and even a return to public utilities replacing the private sector in several countries (Bolivia being the most notorious example).

The following table shows those cases where structural priorities or changes in energy policy have had a significant impact on energy efficiency strategies. Consequently, only those countries in which it is estimated that such linkages have taken place have been included. [41]

[40] In the case of Paraguay, the transport sector could be included as a priority, as fuel consumption by transport is growing rapidly; private car ownership has increased, while public transport infrastructure in urban areas remains very poor. It is remarkable that, in the majority of countries, there is a tendency to associate energy efficiency with power consumption, forgetting the importance of other energy chains.

[41] In several cases (Costa Rica, for example) energy efficiency actions are already articulated with policies from previous decades and, as a consequence, are not the result of recent structural changes.

Table 4.5 Milestones of Structural Changes in Energy Policy

Country	Key Milestones in Energy Policy and Impacts on Energy Efficiency
Bolivia	Structural change from 2006 and the need to reconcile an increasing domestic demand, maintaining exports, and a reserves horizon of non-renewable sources.
Chile	The impact on Chile's energy matrix of the decreased imports of natural gas from Argentina, and the need to reduce the impact of energy on the balance of payments due to replacement by LNG.
Colombia	The four main objectives defined in the Plan 2010/30 involve the incorporation of energy efficiency as a strategy embodied in the PROURE 2010/15.
Cuba	The need to reduce energy imports to improve its trade balance, while promoting the use of renewable sources, means a growing interest in efficiency.
Dominican Republic	The search for greater penetration of natural gas and the required replacement of equipment, as well as the incorporation of renewable energy, implies the desirability of an aggressive programme of energy efficiency.
Ecuador	A programme of hydroelectric development and the replacement of LPG by power in cooking, and a massive penetration of power into other energy services, boosts the energy efficiency programme.
Panama	The guidelines of energy policy incorporate new objectives, and broaden the scope and dimensions to consider, giving increasing opportunities to energy efficiency measures.
Paraguay	While there is no clear manifestation in public policies, recent changes in energy policy and the deepening social and economic aspects involve a wider adoption of energy efficiency strategies.
Peru	The guidelines of the State's Energy Policy, as defined in Plan 2010/40, constitute a new framework that assigns a high priority to energy efficiency strategies to meet the objectives of the plan.
Uruguay	The depletion of conventional local resources (hydropower), difficulties in provision from Argentina, and the need to restructure their energy matrix with a higher weight of new and renewable energies, while its energy intensity should decrease.

In several cases, two factors have contributed to the development of efficiency initiatives. One has already been mentioned and refers to the energy crises in several countries. The other relates to the growing awareness of the impacts of climate change and its effects on the vulnerability of energy systems (especially water resources and the effects of extreme events), which is convincing people that energy efficiency measures not only contribute to reducing emissions but also increase resilience in the face of changes in climate. This second aspect is particularly relevant in the case of the countries of Central America.

Certainly, the countries listed in the table above provide a more favourable framework for intervention and potential technical assistance, since their energy policies give high importance to conservation and efficiency measures.

Potential technological niche development. The size, resources and capabilities of each country will impact strongly on the development of these niches, oriented towards the market for efficient equipment. Some exceptions aside, the countries of the region are "technology takers" rather than technology developers. Furthermore, in the relatively smaller countries, the setting up of laboratories for testing purposes may not be economically justified, possibly working as a barrier to the adoption of standards and labelling programmes.

Replicating actions in other countries in the region. Evaluating the feasibility of extrapolating techniques and strategies to other countries in the region can be important factors to consider for assistance programmes.

We have referred already to the limitations on actions in small countries of the Caribbean. Moreover, there are similarities among countries in matters such as size, level of economic activity and energy systems, providing an opportunity to try similar approaches and share the lessons learned.

The countries of Central America find themselves in this particular situation, and they are also interconnected through their electrical systems, have similar energy resources and similar impacts in terms of climate change, and have already established cooperative action in several areas.

Despite not being in the same geographical region, it is possible to identify similarities in energy systems that allow us to extrapolate experiences and suggest strategies according to the results obtained in the LAC countries. For example, Costa Rica and Uruguay have very similar electrical systems, endowments of resources and even levels of economic and social development.

Consequently, a selection of countries, representative of the characteristics of different sub-regions, could contribute to achieving a broader level of knowledge, lessons learned of easy extrapolation, strategies that can expand regionally, and possibilities for South-South collaboration, among others.

The progress in efficiency policies, the maturity of the measures implemented and the results obtained would be additional criteria for selecting and building on existing experiences.

Degree of progress and local capacity. The following table includes those countries that have expressed the greatest difficulties in terms of existing capacities, or indicated these capacities as major barriers to energy efficiency actions.

We have only indicated cases in which explicit reference has been made to limitations on individual or institutional resources (See Annex II). The fact that such deficiencies are not explicit is no indication that they do not exist; only the barriers or difficulties that are considered the most important have been included. Apparently, the need for capacity building or reinforcement at the individual, institutional and systemic level is a common requirement in the region.[42]

Table 4.6 Capacity Building

Country	Capacity Building
Bolivia	Lack of skilled technicians in the area.
Chile	More professionals are required to be trained in the measurement and verification of results.
El Salvador	Greater technical capacity of the main actors responsible for the design and implementation of energy efficiency measures is required.
Honduras	It is necessary to strengthen the educational system at all levels because energy efficiency is an emerging issue in the country.
Nicaragua	It is necessary to strengthen the education system and build capacity at all levels.
Panama	Weak institutional experience in the promotion and development of projects for saving power. Little knowledge of technologies and good practices associated with energy efficiency.

The lack of a favourable policy environment and an abundance of energy resources. These situations are unfavourable for the proposed assistance and should be considered when carrying out the selection (the case of Trinidad and Tobago).

[42] A conclusion of a recent OLADE document related to the Energy Planning Guidelines (still to be published).

The unfavourable environment (enabling conditions) especially refers to the absence of policies or objectives on energy efficiency actions.

This situation occurs in very few countries in the region, apart from those that have been discussed previously. Although very recently, even countries with abundant energy resources, such as Venezuela, have announced and created institutional frameworks for implementing energy efficiency programmes.

5. Guidance on the assistance required by countries

In response to the survey, the direct contact and the interviews carried out, several countries proved very interested in accelerating energy efficiency measures.

In order to exemplify the kind of assistance and priorities that countries have presented, we describe below the most significant findings.

Bolivia

Technical assistance could help to identify cleaner and more efficient energy solutions that can improve current energy efficiency levels.

In Bolivia it is important to implement new policies opening up the energy systems to private investment, since this will generate new investment opportunities to help eliminate energy poverty, increase access to energy services, and integrate and balance the sources of conventional and renewable energy, all of them oriented towards a regime of sustainable energy.

Cooperation should be directed towards supporting the establishment of regulations and the commencement of the projects included in the Strategic Plan for Energy Efficiency (PAEE) according to the following mechanisms and prioritised results:

- Labelling appliances
- Improve energy efficiency in public offices
- Efficient public lighting

In priority areas, it is expected that technical assistance will be required in the following areas:

- Design of strategic plans
- Planning tools
- Models and simulation (LEAP OSEMOSYS, MESSAGE)
- Mechanisms of indirect intervention
- Subsidies, incentives, penalties
- Labelling and minimum standards
- Norms
- Accreditation of technologies

Additionally, as an enabling activity, the development of local capacities can be viewed as a priority. The first requirement in this area is an assessment of the current status and the basic steps and programmes that should be considered.

Chile

Assistance that would support the National Energy Efficiency Plan includes:

- Funding Mechanisms strategies
- Technology transfer, policies and mechanisms (especially in the industrial sector)
- Development of incentives
- Minimum energy performance standards (MEPS)
- Methodologies for measuring and verifying results
- Mechanisms for implementing laboratory tests for labelled products
- Inter-laboratory trials

Colombia

The next stage of PROURE (2015-20) is under discussion, as well as the possibility of revising the strategy implemented in the last five years to improve the results.

In particular, the incentive mechanisms proposed in different sectors, especially industry, did not boost efficiency improvements as expected in the sector. Consequently, the actions to be prioritized in the case of Colombia would be:

- Diagnostics of the rationality of actors and their response to incentives
- Identification of appropriate strategies, actions and measures
- Assessment and monitoring of strategies and measures
- Evaluation of the effectiveness of efficiency measures already implemented
- Identification of technologies associated with improving public transport
- Design and implementation of viable and feasible public policies according to national circumstances.

Dominican Republic

Energy efficiency is considered a priority issue, but the country faces gaps and barriers of great magnitude that have to be overcome. This requires aggressive intervention and targeted policies.

Given such shortcomings, it is estimated that assistance is required in the following areas:

- Direct intervention mechanisms and incentives in the productive sectors
- Funding mechanisms to facilitate the replacement of obsolete equipment
- Institutional strengthening for the design and implementation of strategies
- Review and proposals for regulatory frameworks oriented towards efficiency
- Development of information and public awareness
- Development of assistance for energy audits
- Assistance for the institutional organisation of policies and energy efficiency strategies

Ecuador

There are programmes and projects to advance energy efficiency and promote the use of renewable resources, where currently there is less development.

The greatest uncertainties relate to the scarce information on consumption, certain institutional weaknesses, and how to inform users better.

Consequently, assistance priorities are linked to:

- Better awareness of energy consumption in energy services for different end uses
- Studies to improve the understanding of the potential for energy efficiency in productive sectors
- Intervention strategies to reduce the energy intensity of industry and transport
- Institutional strengthening to identify barriers and design proposals for action
- Effective mechanisms for information and awareness for the penetration of electrical appliances
- Incentives to promote energy efficiency actions
- Mechanisms of direct intervention
- Penalties for non-compliance with energy efficiency policies.

The authorities estimate that the above issues would add greater value and impact to the effectiveness of policies and strategies.

El Salvador

As noted earlier, the government of El Salvador is very active in introducing a number of energy efficiency measures, indicating that this is an important priority in energy policy.

Despite the progress made, the challenges faced create the following requirements according to the authorities consulted:

- Implementation of methodologies for sectorial studies
- Institutional strengthening
- The development of technical skills in priority sectors
- Strengthening the legal framework, particularly in the implementation of the Law on Energy Efficiency

The areas where technical assistance is required include:

- Technology (hardware, software, orgware)
- Design of policies and strategies
- Incentives (fiscal or financial ones)
- Information (labelling and minimum standards).

Additionally, the need to develop workshops at the highest political level was identified (i.e. the ministerial level, especially those dependencies concerned with education, environmental issues and public finances). Often, many of the measures and/or actions depend on the perception of the situation in these areas.

Honduras

Honduras is in a process of institutional reorganisation and modification of its Law on Ministries. Therefore, energy policy faces opportunities and challenges, and it should establish an institutional structure in line with the problems faced by the country's energy system.

Multiple problems act as determinants of potential efficiency policies, which are still in a nascent state. In this context, the authorities consulted identified as priority areas of cooperation the following:

- Institutional strengthening and capacity building
- Technology transfer
- Financing projects and programmes in all sectors of the economy
- Technology (hardware, software, orgware)
- Design of policies and strategies
- Incentives (fiscal or financial ones)
- Mechanisms of direct intervention
- Incentives, penalties
- Information (labelling and minimum standards).

Nicaragua

Energy efficiency is still an emerging issue in Nicaragua. It has been taking shape and has been institutionalised with recent decrees.

The rational and efficient use of energy is currently one of the strategic priorities of the energy sector, with a particular focus on the power sector.

As has been already noted in this report, Nicaragua wants to promote a National Energy Savings Plan contemplating all types of end-user. This plan will be translated into an Energy Efficiency Act.

In this context, the following areas are considered to be priorities:

- Conducting sectorial studies to identify energy efficiency actions for the residential, government, commerce, industry and services sectors
- The strengthening of technical skills for Bureau of Energy Efficiency personnel and other related ministries such as transport, housing and standardisation, among others
- Establishing baselines for the monitoring and surveillance of programmes and projects
- Developing and/or utilizing software tools for the monitoring and surveillance of programmes and projects, as well as for the establishment of indicators and other tools for simulation
- Accessing financial resources to implement the National Energy Efficiency Programme

As for technical assistance, the following priorities are proposed:

- Software for energy planning and the monitoring and tracking of activities to measure impact
- Review and update existing policies and strategies, as base documents are available
- Capacity building and infrastructure for national quality system and energy efficiency technical standards

- Strategies and support mechanisms are required to minimize the potential negative externalities caused by the implementation of energy efficiency projects
- Advice on new mechanisms of direct intervention

Panama

Law 69 of 2012 defined the strategic plan of Panama in Energy Efficiency and identifies the dimensions required for implementation. It also created the Committee on Energy and the Energy Efficiency Programme, as well as setting out guidelines for incentives and subsidies, funding, standards and labelling, research, education and outreach, among other things.

In this context, the following activities in terms of technical support have been identified for Panama:

- Developing indicators to measure the results of implementing the energy efficiency programme and calculating the rebound effect
- Designing incentives for targets to be defined
- Defining energy efficiency indices
- Labelling and minimum standards for appliances and equipment
- Capacity building (monitoring, supervision and fiscal accounting of processes)
- Adapting standards and norms
- Assessment requirement for the verification and certification of energy-consuming equipment
- Advice on the preparation of an Energy Efficiency Fund

Paraguay

In Paraguay the issue is still in development, so cooperation should cover a broad spectrum of areas.

Those responsible for energy efficiency policy have preliminarily identified the following priority areas:

- Assess institutional organisation to support energy efficiency better
- Develop programmes to support education, awareness and the training of trainers
- Design and implement Rational and Efficient Use of Energy programmes
- Develop energy audits and diagnostics
- Mechanisms to monitor verify and evaluate the sustainability of energy efficiency measures

Uruguay

Uruguay has made significant progress in its programme on energy efficiency and renewable energies. While, regarding the first aspect, the results are still emerging, the clarity of objectives and the strong political will are undeniable.

As a result of consultation and direct exchange with the responsible authorities, the exchange of experiences and lessons learned with other countries was identified as an important factor in determining actions at the national level and promoting the necessary changes.

The programme could promote the creation of a methodology for evaluating and monitoring efficiency actions and policies, as well providing survey information that allows verification of compliance with the goals.

Some of the possible lines of interest are:

- Systematization of information, evaluation and monitoring of the actions on energy efficiency
- Develop and/or improve methodologies for assessing the benefits associated with efficiency policies
- Methodologies and mechanisms to survey the results of energy efficiency measures and verifying compliance goals
- Preparation of studies on the “rebound effect” of the actions, policies and instruments in development and implementation
- Cost-benefits studies of energy efficiency measures in various sectors; and
- Requirements and feasibility of developing local testing skills

6. Conclusions

This report has analysed a diverse set of criteria important for accelerating energy efficiency in the LAC region, and it highlights a range of possible interventions that have been prioritized for a number of LAC countries. Some of these energy efficiency measures need to be initiated and led by governments at the national, regional or local levels. For example, this report could inform the development or updating of National Action Plans on Energy Efficiency. Other measures highlighted in this report could be supported and financed through technical assistance which could come from a range of sources, such as:

- Regional Organisations. For example, ECLAC is well placed to identify energy efficiency opportunities that are common to many of the countries and to provide a platform for a regional approach
- Regional Energy Organisations, like OLADE
- Regional Development Banks. For example, the IDB is prioritizing energy efficiency investment in the region, and this report highlights the range of investment opportunities in LAC countries. Another actor on energy policies in the region is the Andean Finance Corporation (CAF)
- International Development Bank, like the World Bank
- Global Alliances, like the World Energy Council
- Energy Industry
- Private Sector

As mentioned in previous sections, potential support actions could be implemented taking into account the maturity and priorities of the countries concerned, based on a demand-driven programme. The three groups of LAC countries present specific situations that could play different roles in potential technical assistance activities.

The first group of countries consists of Argentina, Brazil and Mexico. They are not identified as the highest priority for technical assistance in the LAC region, but they could be treated as potential providers of technical support to other LAC countries. In particular, Brazil and Mexico have programmes in advanced stages of implementation and development, and sufficient domestic technical capacity to address the major challenges associated with the implementation of policies and strategies for energy efficiency.

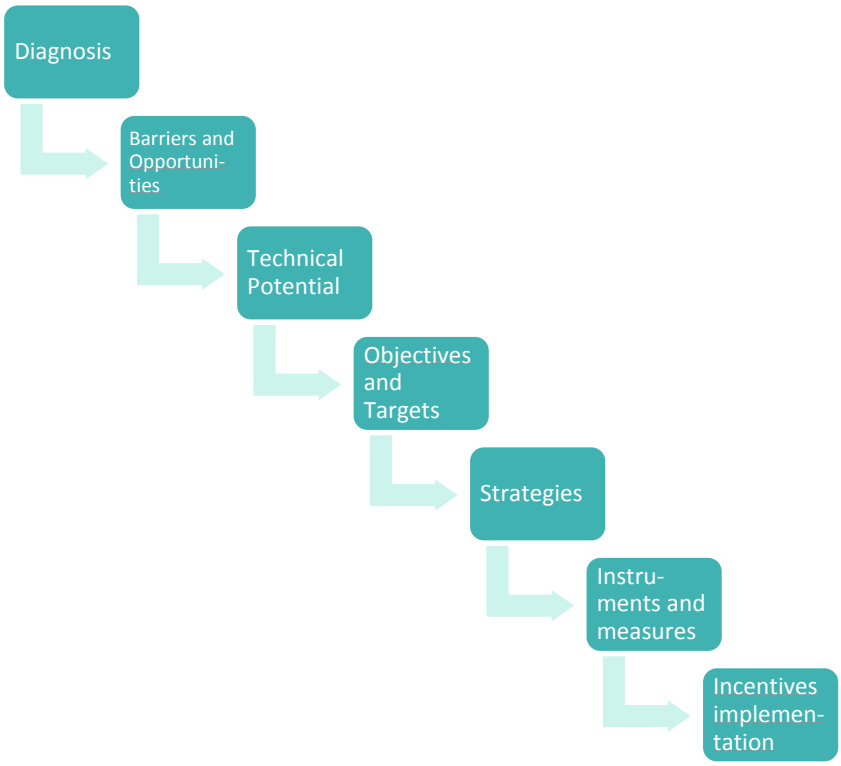
The second and third groups are part of the set of countries that could be considered for technical support. In the second group there are different possibilities, and in several cases, synergies could potentially be used in relation to other assistance programmes that are running. Countries in this second group include Chile, Colombia, Costa Rica, Ecuador, Panama and Uruguay. The way to implement the cooperation that should result from a country request according to the priorities defined above – but also taking into account the levels of internal progress, commitment to the issue and existing technical capabilities – is to ensure that technical assistance has a more significant impact and add value to the activities in progress. Also, experience from this group of countries could be adopted or modified in other countries in the region. It is estimated that, in all cases, there is a very positive and receptive mood to technical assistance, coupled with an enabling environment that is stable, prioritized and represents a long-term vision.

Finally, the third group is the most complex when it comes to identifying potential recipients and prioritizing them. Countries in this group include Bolivia, the Dominican Republic, El Salvador, Guatemala, Guyana, Honduras, Nicaragua and Paraguay. Many Caribbean countries do not give a significant priority to the issue of energy efficiency, and the actions that they could implement would have a limited impact in both the global targets and the ability to replicate them in the rest of the region. In many cases, new government plans are being developed, and energy efficiency stands out as a high priority. Additionally, it is estimated that the experiences arising from the countries of the third group could generate lessons that could easily be extrapolated to similar countries in terms of level of development, national circumstances and the characteristics of their energy systems, as is the case with other countries in Central America.

In all such cases, the type of assistance, its objectives and stages of intervention – all in accordance with the logical process indicated in Figure 6.1 – should emerge from an agreement with the authorities of the selected countries. The assistance could be linked to one or more of the blocks shown in Figure 6.1, according to the needs and priorities set by countries.

Similarly, the existence of an energy policy objective associated with the transition toward greater levels of efficiency involves defining a clear process with different stages, each of which should be completed if we are to achieve the proposed objectives and goals.

Figure 6.1 Step-wise process to develop Logical policy Process[43].

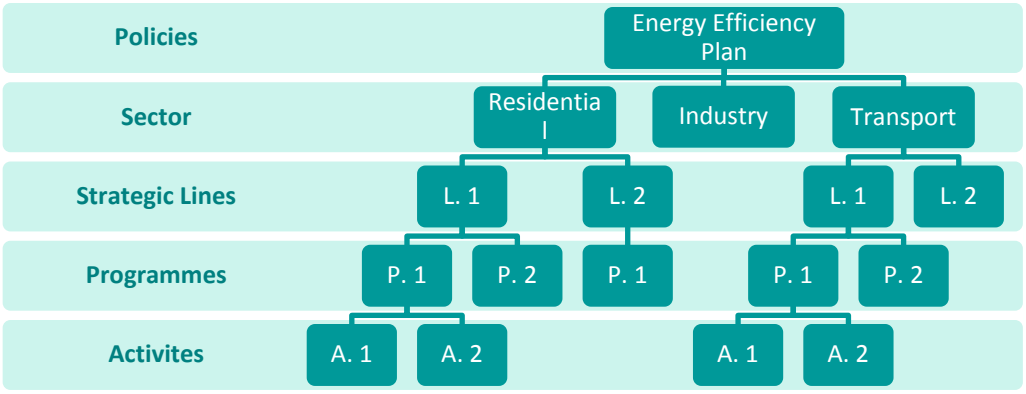


[43] As usual, the initial step is the diagnosis.

It has been observed that many of the shortcomings and difficulties in implementing results are linked to an inadequate definition of stages, to some of them being skipped, or to an incorrect definition of what these stages represent and involve.

Accordingly, the scope of potential technical assistance should be set out in a comprehensive framework (as indicated by Figure 6.2) so as to provide an opportunity for all the components associated with an energy efficiency intervention to be considered for assistance.

Figure 6.2 Key steps in developing an implementation strategy



References

Altomonte Hugo, Coviello Manlio, Lutz Wolfgang. 2003. Energías renovables y eficiencia energética en América Latina y el Caribe. Serie 65, División de Recursos Naturales e Infraestructura, Santiago, Chile.

Carpio, Claudio; Coviello, Manlio F. 2014. Naciones Unidas, Comisión Económica para América Latina, CEPAL – Cooperación alemana. Energy Efficiency *in Latin America and the Caribbean: Progress and challenges of the past five years.*

Comisión Económica para América Latina, CEPAL. 2011. *Eficacia institucional de los programmeas nacionales de eficiencia energética: los casos del Brasil, Chile, México y el Uruguay*.

Comisión Económica para América Latina, CEPAL. Conclusiones del *"IV Diálogo político regional en eficiencia energética"*. Ciudad de México, 21 y 22 Noviembre de 2013.

Comisión Económica para América Latina, CEPAL. 2013. *Eficiencia energética en América Latina y el Caribe: Avances y desafíos del último quinquenio*.

Comisión Económica para América Latina, CEPAL. 2014. "Informe Nacional de Monitoreo de la eficiencia energética de la República Argentina".

Comisión Económica para América Latina, CEPAL. 2014. "Informe Nacional de Monitoreo de la eficiencia energética de la República de Chile".

Consejo Nacional de Energía, CNE. Global Environmental Facility, GEF. Programmea de las Naciones Unidas para el Desarrollo, PNUD. 2014. *Informe técnico de ejecución de proyecto. Proyecto de eficiencia energética en edificios públicos. El Salvador.*

Corporación Andina de Fomento, CAF junto a ALADI-ARPEL-CEPAL-CIER-OEA-OLADE-WEC. 2013. *Energía: Una visión sobre los retos y oportunidades en América Latina y el Caribe. Eficiencia energética*.

Coviello, Manlio F. Naciones Unidas, Comisión Económica para América Latina, CEPAL. 2013. *Situación y Perspectivas de la Eficiencia Energética en América Latina y el Caribe*.

Ecofinanças (Brasil). 2014. *Eficiência energética é desafio para indústria energía eléctrica y nuclear*.

Estado Plurinacional de Bolivia, Ministerio de Hidrocarburos & Energía. 2013. *Balance energético nacional 2000-2012*.

Estado Plurinacional de Bolivia, Ministerio de Hidrocarburos y Energía. *Anuario estadístico. Gestión 2012. Producción, transporte, refinación, almacenaje y comercialización de hidrocarburos.*

GEA, 2012: *Global Energy Assessment - Toward a Sustainable Future*, Cambridge University Press, Cambridge, UK and New York, NY, USA and the International Institute for Applied Systems Analysis, Laxenburg, Austria.

GEF/IDB/UNDP. BRA/09/G31 - Market Transformation for Energy Efficiency in Brazil-PIMS 3665, GEFSEC Project ID: 2941 -2009/2013

Gobierno de Reconciliación y Unidad Nacional, Nicaragua. 2013. *Plan de Acción SE4ALL Nicaragua 2014 – 2030. Mesa redonda sobre Energía.*

Gobierno de la Republica de El Salvador. Mesa de Cambio Climático. 2014. *Propuesta ante el alto riesgo de nación al cambio climático, para el Plan Quinquenal 2014-2019 del Gobierno de la República de El Salvador*.

Gomelsky, Roberto. 2013. *Evaluación rápida y análisis de brechas en el sector energético (RG-T1881) Ecuador*.

Horta, Luiz Augusto, Coord. Naciones Unidas, Comisión Económica para América Latina, CEPAL. Cooperación alemana. 2010. *Indicadores de políticas públicas en materia de eficiencia energética en América Latina y el Caribe*.

International Monetary Fund. 2015. *Energy Subsidies in Latin America and the Caribbean: Stocktaking and Policy Challenges*.

Ki-moon, Ban. United Nations. 2011. *Sustainable Energy for All*.

Kreuzer, Fabian. 2014. Eficiencia energética y movilidad en América Latina y el Caribe: Una hoja de ruta para la sostenibilidad. CEPAL.

Ministerio de Coordinación de Sectores Estratégicos, Ecuador. 2013. *Balance Energético Nacional 2013, año base 2012. Series históricas 1995-2012.*

Ministerio de Energía, Chile. 2010. *Plan de acción de eficiencia energética 2020*.

Ministerio de Energía y Minas, Dirección General de Políticas y Planificación, Nicaragua. 2013. *Balance energético nacional 2012*.

Ministerio de Hidrocarburos y Energía, Bolivia. 2014. *Audiencia parcial de rendición pública de cuentas 2013*.

Marandin, Lâl. 2013. *Sustainable Energy for All. Nicaragua: Rapid assessment and gap analysis.*

Naciones Unidas. 2013. Energía para todos. *República Dominicana. Evaluación rápida y análisis de brechas.*

Naciones Unidas. 2012. *Sustainable Energy for All. A global action agenda. Pathways for concerted action toward a sustainable energy for all.*

Naciones Unidas. 2012. *Sustainable Energy for All. A commitment to a sustainable energy future.*

Naciones Unidas, Comisión Económica para América Latina, CEPAL. – Cooperación alemana – Organisación Latinoamericana de Energía, OLADE. 2009. *Situación y perspectivas de la eficiencia energética en América Latina y el Caribe*.

Organisación Latinoamericana de Energía, OLADE. Austrian Development Cooperation. 2013. *The sustainability of Energy Efficiency: Latin America and the Caribbean. Energy Efficiency Programme, PALCEE*.

Organisación Latinoamericana de Energía, OLADE. 2014. *Manual de Planificación Energética.*

Ortiz, Raúl. Banco Interamericano de Desarrollo, BID – Programmea de las Naciones Unidas para el Desarrollo, PNUD. 2014. *Sustainable Energy For All (SE4ALL). Guatemala: rapid assessment and gap analysis*.

Poveda, Mentor. 2007. Eficiencia Energética: Recurso no aprovechado. OLADE.

Ruchansky, Beno; de Buen, Odón; Januzzi, Gilberto y Romero, Andrés. 2011. *Eficacia institucional de los programmeas nacionales de eficiencia energética: los casos del Brasil, Chile, México y el Uruguay*. Naciones Unidas, Comisión Económica para América Latina, CEPAL, Cooperación alemana. División de Recursos Naturales e Infraestructura. Serie Recursos Naturales e Infraestructura Nº 152.

Secretary-General's High-level Group on Sustainable Energy for All, SE4ALL. 2012. *Technical report of task force 1 in support of the objective to achieve universal access to modern energy services by 2030.*

Secretary-General's High-level Group on Sustainable Energy for All, SE4ALL. 2012. *Technical report of task force 2 in support of doubling the global rate of Energy Efficiency improvement and doubling the share of renewable energy in the global energy mix by 2030.*

Secretary-General's High-level Group on Sustainable Energy for All, SE4ALL. 2012. Sustainable Energy for All. A global action agenda. Pathways for concerted action toward sustainable energy for all.

Secretary-General's High-level Group on Sustainable Energy for All, SE4ALL. Improving Energy Efficiency. Efficient lighting.

Secretaría Nacional de Energía, República de Panamá. 2012. Política nacional de uso racional y eficiente de la energía.

Smallridge, Diana; Buchner, Bárbara; Trabacchi, Chiara; Netto, María; Juan Gomes Lorenzo, José; y Serra, Lucila. Inter-American Development Bank, IADB. 2013. The role of national development Banks in catalyzing International climate finance.

Sustainable energy for all. 2012. Technical Report of Task Force 2: in support of doubling the global rote of energy efficiency improvement and doubling the share of renewable energy in the global energy mix by 2030.

United Nations Climate Summit. New York, 2014. ENERGY. Sustainable Energy for All, Global Energy Efficiency Accelerator Platform. Action statement and action plan.

United Nations Foundation. 2007. Expert report. Realizing the Potential of Energy Efficiency. Targets, Policies, and Measures for G8 Countries.

Annexes

Annex I. Interviewees (face-to-face or teleconference)

The following countries and members of governments were interviewed face-to-face or by teleconference.

Section A. Face-to-face meetings and direct consultation to identify key issues in potential technical assistance

Country	Civil Servant	Position	Institution
Bolivia	Jorge Leitón Quiroga Alejandra Huaylla	Energy Planning Director Energy Planning Expert	Vice-Ministry of Energy Development
Chile	Ignacio Santelices Ruiz	Chief of Energy Efficiency Direction	Energy Ministry
Colombia	Carlos García Olga González	Director of Energy Demand Advisor to the Director	Energy Planning and Mines Unit - UPME
Ecuador	Carlos Alberto Dávila Dávila Henry Acurio	Strategy Sectors Coordinator Technical Analyst	Ministry of Power and Renewable National Institute of Energy Efficiency and Renewable
Honduras	Dania Baca Wilmer Henriquez	Energy National Director Sector Expert	Energy, Natural Resources, Environment and Mines Secretary
Paraguay	Gustavo Cazal	National Coordinator of the Energy Efficiency Commission	Vice-ministry of Energy and Mines
Uruguay	Ramón Méndez Carolina Mena	Energy Director Coordinator Demand, Access and Energy Efficiency Division	National Direction of Energy

Annex II. Questionnaire Concerning Sustainable Energy for All Programmes

Section B. Sustainable Energy for All Programmes (SE4ALL). Survey aimed at those responsible for energy efficiency in LAC

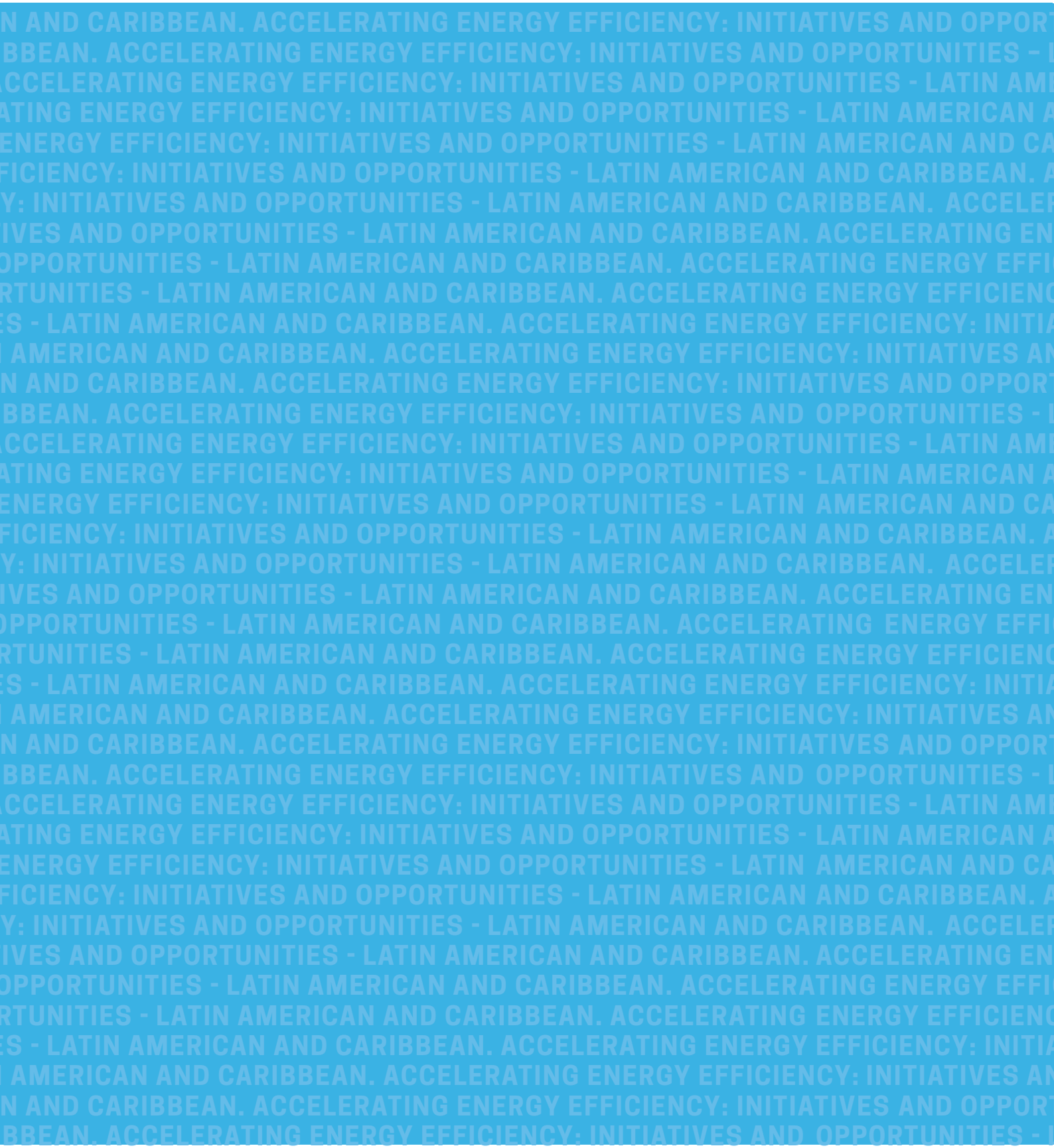
Please indicate your response or comments in the space below each question
1. Information on successful energy-efficiency (EE) initiatives already implemented, and initiatives in course or due to start soon in your country.[44]
2. Obstacles that have been identified, presently or in the past, and potential actions to overcome them.
3. Do you utilize or have you undertaken comprehensive energy studies, such as on net and useful energy balances, in order to identify the consumer sectors that are most amenable to energy efficiency measures?
4. Do you carry out energy audits by sectors and consumer branches? If yes, in which sectors?
5. What are the best courses of action on energy efficiency (at sector, subsector or transversal levels) according to the information or studies available? What would be the most relevant national and global benefits flowing from these initiatives? Are there any studies that quantify the estimated savings?
6. Has an energy efficiency action plan been implemented, or is one currently under consideration? Are there any details or documentation on it?
7. Has there been any follow up and/or monitoring of the implemented measures, as well as the elaboration of indicators? Are there any estimates on the potential rebound effect of efficiency measures?
8. One of the objectives of the SE4ALL Programme is to double the rate of improvement on energy efficiency by 2030, in the following senses: i. How do you think that the SE4ALL Programme could be of help in promoting energy efficiency in your country? ii. Which sectors should be given priority, and what would be the most conducive actions? iii. How would these measures be articulated with the energy policy objectives of your country, and how do they converge with, and respond to, its energetic priorities? iv. Is your government interested in receiving technical assistance on this matter? What kind of assistance would be of most value, and in which areas: technologies (hardware, software, orgware), policy and strategy design, induction measures, direct intervention mechanisms, incentives, penalties, information (labelling and standards), etc.?
9. Given that SE4ALL also pursues the objective of facilitating and promoting access to more and better energy services, and increasing the participation of renewables in the energy matrix, we are interested in your opinion about energy efficiency measures that might be linked to these other objectives.
10. Would you be ready to hold a teleconference to exchange ideas on these topics?
11. Do you consider it necessary or appropriate that we organise a visit to your country to broaden the discussion and the exchange with other actors? Which actors would you consider relevant for this task?
12. Is there any other consideration or observation that you would like to mention?

[44] In responding to this question, it is extremely important to distinguish between those initiatives that have to do with institutional construction (if there are EE policies that require long-term coordinated action; if there is an agency or a permanent unit dedicated to the subject; if there is a legal framework or model on EE; if mechanisms for promoting and funding EE are being implemented, etc.) from those involving the implementation of specific projects (e.g., EE programme for street lighting, implementing a system of energy labelling, development of a market for ESCOs, efficiency standards for vehicles, etc.). In other words, the term "initiative" should be broadly understood.

Annex III. List of Polled Countries

Section C. List of polled countries

Country	Responsible	Institution
Argentina	Hernán Furfaro	Secretaría de Energía
Barbados	William Hindst	Renewable Energy and Energy Conservation
Belize	Joy Grant	Ministry of Energy, Science, Technology and Public Utilities
Bolivia	Franklin Molina	Ministerio de Hidrocarburos y Energía
Brazil	Jorge Paglioli Jobim	Ministerio de Minas y Energía
Chile	Ignacio Santelices Ruiz	Ministerio de Energía
Colombia	Carlos García	Unidad de Planificación Minero Energética
Costa Rica	Henry Chinchilla	Instituto Costarricense de Electricidad
Cuba	Ramsés Montes Calzadilla	Oficina Nacional para el Uso Racional de la Energía
Dominican Republic	Damarys Marte	Comisión Nacional de Energía
Ecuador	Carlos Alberto Dávila Dávila	Ministerio Coordinador de Sectores Estratégicos
El Salvador	Ing. Mario Cáceres	Consejo Nacional de Energía
Grenada	Nazim Burke	Ministry of Finance, Planning, Economy, Energy, Foreign Trade and Cooperatives
Guatemala	Julio César Solares Peñate	Dirección General de Energía
Guyana	Mahender Sharma	Guyana Energy Agency
Honduras	Wilmer Henriques	Secretaria de Energía Recursos Naturales y Ambiente
Jamaica	Yvonne Barrett-Edwards	Ministry of Energy
México	Odon de Buen	Comisión Nacional para el Uso Eficiente de la Energía
Nicaragua	Shu-yan Delgado	Ministerio de Energía y Minas
Panamá	Carlos Iglesias	Secretaría Nacional de Energía
Paraguay	Gustavo Cazal Bogarín	Viceministerio de Minas y Energía.
Perú	Iris Cárdenas Pino	Ministerio de Energía y Minas
Surinam	Jim Hok	Ministry of Natural Resources
Trinidad and Tobago	Kevin Ramnarine	Ministry of Energy and Energy Affairs
Uruguay	Carolina Mena	Dirección de Energía
Venezuela	Yolanda Mantilla	Ministerio del Poder Popular para la Energía y Petróleo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