

Monitoring of SDG 7 policies in Latin American countries

Laura Sudries

Bruno Lapillonne



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Laura Sudries
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Contents

Executive summary	7
Acknowledgements	9
Introduction	11
I. Overview of measures by type	19
A. Regulations	21
1. Energy efficiency labels	21
2. MEPS.....	21
3. Other regulations	22
B. Financial incentives and fiscal instruments	22
C. Measures on information	22
II. Institutional context	23
A. Energy efficiency laws	23
B. Quantitative objectives of energy efficiency plans	25
C. National energy efficiency agencies	26
D. Other horizontal measures.....	26
III. Households and services	29
A. Labels for households' appliances	29
B. Energy efficiency labels for buildings.....	30
C. MEPS on electrical appliances	31

D.	Energy efficiency standards for buildings	32
E.	Mandatory requirements for some consumers	32
F.	Information dissemination	33
IV.	Transport	35
A.	Labels for cars and light vehicles	36
B.	Electrification of transport	36
V.	Industry	39
A.	Labels for electric motors	39
B.	MEPS for electrical motors	40
C.	Mandatory requirements for large consumers	40
VI.	Conclusions	43
	Bibliography	45

Tables

Table 1	Sources of information of the BEE policy data base	12
Table 2	Summary of measures' descriptors by sector in BIEE policy data base	13
Table 3	Energy efficiency targets in LACs	26
Table 4	Labels for households' equipment in LACs (2021)	29
Table 5	MEPS for appliances and lamps	31
Table 6	Energy efficiency measures in transport	35
Table 7	Measures on electric mobility in Costa Rica and Uruguay	37
Table 8	Overview of measures in industry	39

Images

Image 1	Example of query of measures in BIEE policy data base: car labelling	14
Image 2	Example of short measures description	14
Image 3	Example of impact evaluation: case of energy efficiency labels in Panama	15

Figures

Figure 1	Number of new measures implemented by period	15
Figure 2	Number of measures by sector in LACs	16
Figure 3	Number of measures by sector by country	16
Figure 4	Distribution of sectoral measures by sector	17
Figure 5	Distribution of sectoral measures by country and sector	17
Figure 6	Distribution of all measures by type	20
Figure 7	Number of measure types by country	20
Figure 8	Share of countries with efficiency standards in LACs by type of equipment (2021)	21
Figure 9	Sales of new refrigerators and Air Conditioning appliances in Chile by label class	30
Figure 10	Share of refrigerators and Air Conditioning appliances of class A in total sales in Uruguay	30
Figure 11	Specific consumption of new refrigerators in Mexico	32
Figure 12	Impact of labels on sales of electric motors by class in Chile	40

Maps

Map 1	Energy efficiency law and institutions in LACS	24
Map 2	Energy efficiency law and institutions in LACS	24
Map 3	Energy efficiency labels for cars in LACS	36

Boxes

Box 1	Energy efficiency law and energy efficiency fund: case of Uruguay.....	25
Box 2	Energy efficiency target and programmes in Mexico	25
Box 3	Energy Efficiency Certificates in Uruguay to support investment in energy efficiency.....	27
Box 4	Energy saving obligation in Brazil: PEE	27
Box 5	Monitoring of energy efficiency policy plan: case of Uruguay	44

Executive summary

This report reviews the policy measures implemented by sector in the field of energy efficiency, end-use renewables and energy access in 16 Latin American and Caribbean countries (LACs)¹. It aims at contributing to the monitoring of SDG 7. The analysis is based on the BIEE policy data base² that was developed under the BIEE project (“Base de Información de Eficiencia Energética”) of the Division of Natural Resources and Infrastructure of ECLAC.

The report was prepared by Bruno Lapillonne and Laura Sudries from Enerdata in close cooperation with ADEME, with the support of the French Development Agency (AFD), through the EUROCLIMA programme of the European commission, which aims to support countries in the Latin American and Caribbean region. Both are consultants to the Water and Energy Unit of the Natural Resources Division of the Economic Commission for Latin America and the Caribbean (ECLAC) in the framework of the activities of the GET.transform project, which is part of the Global Energy Transformation program GET.pro and supported by the European Union as a whole, Germany, Austria, the Netherlands and Sweden.

The main conclusions and findings are summarized below:

- The implementation of energy efficiency measures in LACs has intensified since 2010, with almost three quarters of all measures implemented since then.
- The residential sector is the dominant sector addressed by these measures, with around 40% of all sectoral measures.
- Around one third of measures are regulations on appliances and equipment, combining mandatory information on energy efficiency labels and Minimum Energy Performance Standards (MEPS).

¹ Argentina, Bolivia (Plurinational State of), Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guyana, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, and Uruguay.

² <https://biee-cepal.enerdata.net/measures>.

- Most countries have an energy efficiency law and a national energy efficiency programme. However only half of these programmes have quantitative targets. Only two countries have a national energy efficiency agency: Mexico and Chile.
- Two countries have set innovative measures: Brazil, with an energy saving obligation for electric utilities, and Uruguay, with a competitive subsidy programme through energy efficiency certificates.
- Around three quarters of LACs have labels and MEPS for households' appliances. The number of equipment with labels or MEPS is close to 10 in 5 countries.
- Measures in transport include mainly labelling for cars and light vehicles and measures to promote electric mobility. Costa Rica and Uruguay are the most advanced countries in supporting the electrification of transport modes.
- The most frequent measures in industry are energy efficiency labels and MEPS for electric motors. Two countries have mandatory requirement for large consumers (energy consumption reporting in Mexico and energy saving plans in Costa Rica).
- The monitoring of the impact of policy measures is important to check that these measures are effective. This monitoring can be done measure by measure (bottom-up evaluation) or through an analysis of trends in energy efficiency indicators (top-down evaluation). Only a few countries are doing a real monitoring of the impact of policy measures, mainly Brazil, Mexico, and Uruguay.

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³ French Agency for Ecological Transition.

⁴ Economic Commission for Latin America and the Caribbean.

Introduction

The objective of this report is to provide an assessment of the deployment of policy and measures in Latin American and Caribbean countries (LACs) related to energy efficiency, energy access and end-use renewables⁵.

This report was prepared in the framework of UN-ECLAC's BIEE-ROSE⁶ programme (Regional Observatory on Sustainable Energy)⁷. The objective of this project is to build technical capacities in institutions responsible for formulating energy saving programmes at national level. It also aims to use a common methodology to collect information on energy efficiency and SDG 7 monitoring.

The project is supported by the French Development Agency (**AFD**), through the **EUROCLIMA** programme of the European commission, which aims to support countries in the Latin American and Caribbean region. It benefits from the technical support of **ADEME** and **Enerdata**.

The project relies on two data bases covering Latin America and Caribbean countries:

- The first one on SDG 7 **indicators** measures performances on energy efficiency, renewables and energy access, globally and by sector (energy, transport, industrial, residential, services and agriculture) (see <https://biee-cepal.enerdata.net/datamapper/>);
- The second database, the so-called BIEE policy data base compiles national **policies** implemented by sector on energy efficiency, end-use renewables, and energy access (see <https://biee-cepal.enerdata.net/measures/>).

This report relies mainly on the BIEE policy data base.

⁵ Measures on the promotion of renewables in the power sector are not included, as they are already well documented.

⁶ BIEE : Base de Información de Eficiencia Energética; ROSE: Regional Observatory on Sustainable Energy.
<https://www.cepal.org/es/proyectos/programa-biee-base-de-indicadores-de-eficiencia-energetica>
<https://www.cepal.org/es/rose>.

⁷ Portal of the project <https://biee-cepal.enerdata.net/>.

A. The BIEE policy data base

The focus of the BIEE policy data base is on energy efficiency, renewables and energy access in end-use sectors (i.e. households, industry, transport and services). This matches the three sub-goals of SDG 7 of the United Nations, “Ensuring access to affordable, reliable, sustainable and modern energy for all”. The data base covers Latin America and the Caribbean countries.

Measures on renewables that only address the power sector are not included as they are already well covered by other data bases and more similar from one country to the other; moreover, the development of renewables in this sector is usually market driven.

The BIEE policy data base presently covers 16 countries: Argentina, Bolivia (Plurinational State of), Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guyana, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay.

Information has been mostly provided by Ministries in charge of energy efficiency that are participating in the BIEE programme. For three countries however, the information has been collected by Enerdata from national sources. Table 1 summarises the sources of information.

Table 1
Sources of information of the BEE policy data base

Country	Sources
Argentina	Government of Argentina, Ministerio de Economía
Bolivia (Plurinational State of)	Enerdata based on information from World Bank
Brazil	Coordenação-Geral de Eficiência Energética, Departamento de Desenvolvimento Energético, Ministério de Minas e Energia
Chile	División Eficiencia Energética, Ministerio de Energía
Colombia	Enerdata based on information from Ministerio de Minas y Energía, UPME
Costa Rica	SEPSE, Secretaría de Planificación del Subsector Energía
Ecuador	Dirección de Análisis y Prospectiva Eléctrica, Ministerio de Energía y Recursos Naturales no Renovables
El Salvador	Dirección de Eficiencia Energética, Consejo Nacional de Energía
Guyana	Energy and Energy Statistics Division, Guyana Energy Agency
Honduras	Director, Instituto de Investigación en Energía, UNAH
México	Dirección de Políticas y Programas, CONUEE
Nicaragua	Enerdata based on information from Asamblea Legislativa de Nicaragua and CEPAL.
Panamá	Secretaría Nacional de Energía
Paraguay	Viceministerio de Minas y Energía
Peru	Enerdata based on information from Dirección General de Eficiencia Energética, MINEM and Osinerg, Organismo Supervisor de la Inversión en Energía y Minería
Uruguay	Dirección Nacional de Energía, Ministerio de Industria, Energía y Minería (MIEM)

Source: BIEE Cepal policy database.

In the BIEE policy data base, policy measures are organised in 5 sectors:

- i. Horizontal
- ii. Households

- iii. Services
- iv. Industry
- v. Transport

The measures by sector are organised in 7 main types: 1) mandatory information, 2) regulations, 3) financial, 4) fiscal, 5) information, 6) sectoral programmes and 7) others.

The measures by sector are further specified by sub-type (e.g. mandatory labels or mandatory audits for mandatory information; subsidies or soft loans for financial measures).

The measures by sector are also characterized according to the end-use to which they apply and according to their target, i.e. to which actors they are addressed (e.g. SMEs in industry, low income households, public buildings in services, modal shift in transport, etc.).

Measures sub-types, end-uses and targets depend on the sector.

Several other measures' descriptors are added, such as their status (i.e., on-going, planned, ended), date of implementation and expected qualitative impact in terms of energy savings (high medium, low). All the descriptors are summarised in Table 2.

Table 2
Summary of measures' descriptors by sector in BIEE policy data base

Types	Mandatory information, regulations, financial, fiscal, information, others, sectoral programmes
Sub-types	Horizontal (14), households (17), services (24), industry (19), transport (25)
End-uses	Households (12), services (6), industry (5), transport (5)
Targets	Actors: households (6), services (6), industry (5), transport (5)
Status	Ongoing, planned, completed
Others	Qualitative impact (i.e. high, medium or low) in terms of energy savings (energy efficiency measures) or level of energy/technology penetration (for energy access/ renewables)

Source: BIEE Cepal policy database.

Policy measures can be queried:

- by key words (e.g. "energy poverty");
- by sector;
- by type: e.g., mandatory information, regulation (i.e. obligation), financial (e.g. subsidies), fiscal (taxes), etc.

Additional filters can be used for a more refined query, with a search :

- by measure sub-type: e.g., for regulation: minimum energy efficiency standards, obligation for large consumers (e.g. mandatory audits).
- by end-use or type of appliance.

Image 1 shows an example of query in the case of car labelling.

Queries can be done in English <https://biee-cepal.enerdata.net/en/measures> or Spanish <https://biee-cepal.enerdata.net/es/medidas>.

Image 1
Example of query of measures in BIEE policy data base: car labelling

COUNTRY	SECTOR	TITLE	TYPES	STARTING DATE
Argentina	Transport	Vehicle Labeling	Mandatory information	2019
Brazil	Transport	Brazilian Vehicle Labeling Program	Information	2009
Chile	Transport	Vehicle Labeling	Mandatory information	2013
Costa Rica	Transport	Regulation of Badges for electric vehicles	Mandatory information	2019
Ecuador	Transport	Vehicle labelling	Mandatory information	2021
Uruguay	Transport	Energy Efficiency Labeling - Vehicles	Information	2013

Source: BIEE Cepal policy database.

By clicking on a measure (e.g. case of Uruguay) more information can be obtained on the measure. First it is possible to get a short description and to display all the descriptors of the measure (i.e. type, sub-type, end-use, dates of implementation, qualitative impact, etc.) (see Image 2).

Image 2
Example of short measures description

Energy Efficiency Labeling - Vehicles

Measure Code **Country**
 TRA-URY0218 Uruguay

Short description :

The Energy Efficiency Standardization and Labeling Program consists of generating standards and technical specifications that allow classifying the different products and equipment that consume energy according to their degree of efficiency. The equipment, devices and vehicles are tested and classified according to these criteria, incorporating a label that indicates their level of efficiency. One of the main advantages of these labels is that they allow consumers to make better decisions at the time of purchase, being able to select the equipment that is most convenient for them from an energy point of view.

Reference :

Norma 1130:2020 - <http://www.eficienciaenergetica.gub.uy/documents/20182/26296/UNIT-11302020-Doc.pdf/403760af-a029-4917-af17-e80030c28f52>

Status **Issuing date** **Starting date** **Ending date** **Semi quantitative Impact**
 Ongoing 2013 2013 Medium

Types :

Information - Voluntary labelling

Target :

Vehicle choice

Source: BIEE Cepal policy database.

Apart from this summary information it is also possible to have access to a more detailed description and to the measure impact if any assessment has been made (see example in Image 3).

Image 3
Example of impact evaluation: case of energy efficiency labels in Panama

Impact evaluation :

Análisis Técnico-Económico del impacto del programa de etiquetado con apoyo del Banco Mundial, los resultados muestran que a nivel país, el programa ahorrará:

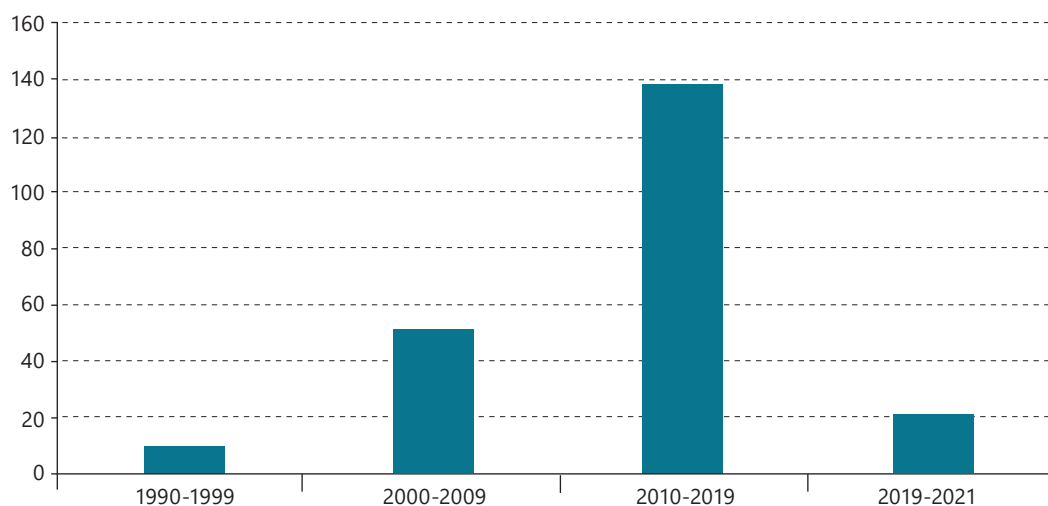
- 370 GWh por año en 2030 (un 14% del consumo eléctrico en el sector residencial en 2015)
- Más de 100 Millones de USD hasta 2030
- 70 MW evitados en capacidad eléctrica instalada en 2030 (aproximadamente 300 Millones de USD)
- 1.6 Mt de CO2 (equivalente a más de 30,000 automóviles) entre 2019-2030

Source: BIEE Cepal policy database.

B. Overview of measures

Almost 200 active measures have been identified in the 16 countries and 240 including proposed measures and measures no longer active⁸. The implementation of energy efficiency measures has intensified since 2010, as shown by the number of new measures by period of 10 years: almost three quarters of all measures have been implemented since 2010 (Figure 1).

Figure 1
Number of new measures implemented by period^a



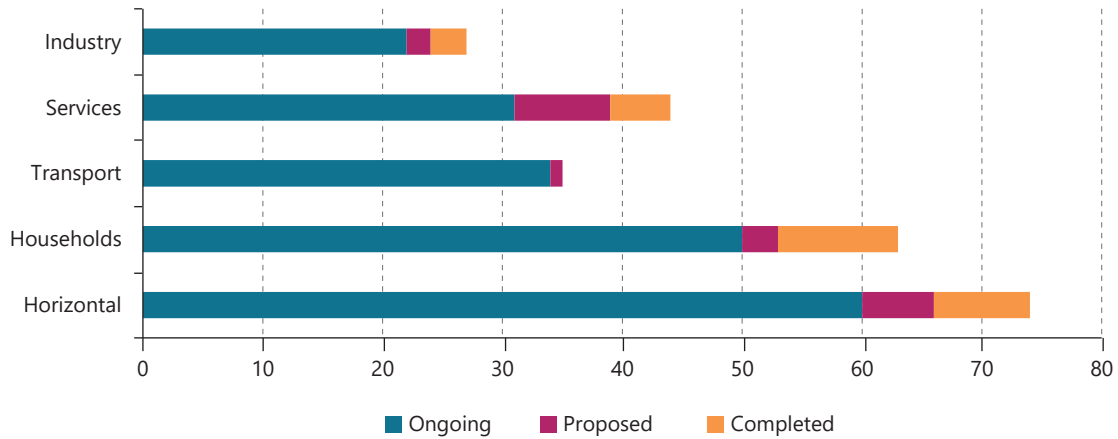
Source: BIEE Cepal policy database.

^aThe number of measures by period is lower than the total number as some proposed measures do not have a date of implementation.

The majority of measures are horizontal, i.e. not sector specific, which is logical, as it is the necessary backbone to start implementing sectoral measures.

⁸ The analysis relies on the state of the data base as of end of July 2021; as countries keep on adding new measures, this may not exactly reflect its content at the date of publication; however, the most important measures were covered.

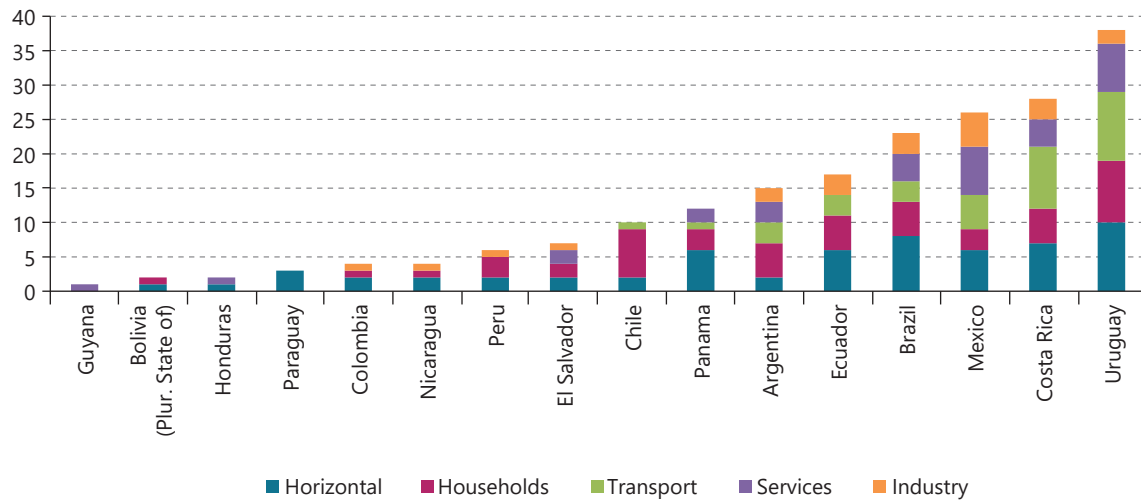
Figure 2
Number of measures by sector in LACs



Source: BIEE Cepal policy database.

The number of measures by country varies quite a lot from one country to the other: it is above 20 in 4 countries (Brazil, Mexico, Costa Rica and Uruguay), but below 5 in 6 countries. The number of measures is purely indicative as despite a harmonisation of their presentation in the data base, a regulation may be duplicated for many appliances and sectors in a country but grouped in less categories in another country.

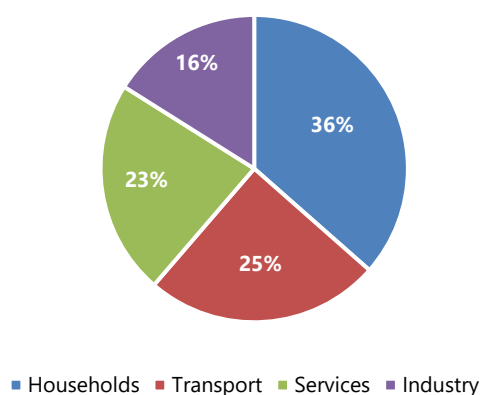
Figure 3
Number of measures by sector by country^a



Source: BIEE Cepal policy database. If horizontal measures are excluded, the residential sector (i.e., households) is the dominant sector addressed by energy efficiency measures in LACs, as it concentrates 36% of all sectoral measures; it is followed by transport (25%), services (23%) and industry (16%) (Figure 4).

^a Ongoing measures only.

Figure 4
Distribution of sectoral measures by sector^a



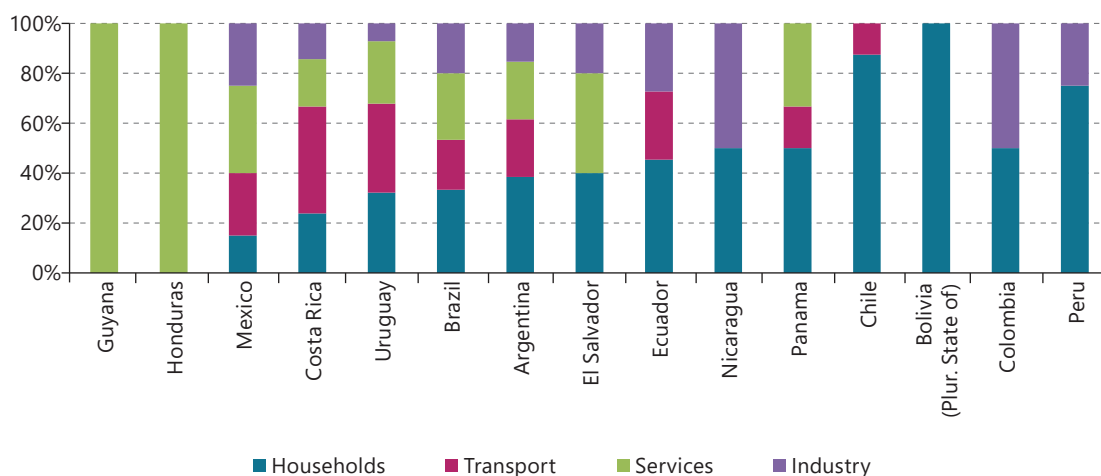
Source: BIEE Cepal policy database.

^a Ongoing measures only and horizontal measures excluded.

Buildings (households and services) attract around 60% of all measures, a share three times more important than their participation in the final energy demand (around 23% for the region). Indeed, considering the size and continuous growth of household appliances market in LACs, equipment efficiency is a very significant aspect of energy efficiency strategies. Governments in LACs have widely used regulations for that purpose, by establishing Minimum Energy Performance Standards (MEPS) and energy efficiency labels for electrical appliances to eliminate the inefficient products from the markets. They have also focused on public services (public buildings and public lighting), as it is a sector on which they have a direct influence.

In Argentina, Brazil, Costa Rica, Mexico, and Uruguay, which are the most active countries, the measures are quite diversified among sectors (Figure 5). In El Salvador, Ecuador and Panama, the focus is on 3 sectors only. In some countries only one sector is targeted: households in Bolivia (Plurinational State of), Colombia, Peru, and, to a lower extent, Chile; services in Guyana and Honduras.

Figure 5
Distribution of sectoral measures by country and sector^a



Source: BIEE Cepal policy database.

^a Horizontal measure excluded (ongoing measures only); only horizontal measures in Paraguay.

I. Overview of measures by type

Around one third of measures are regulations on appliances and equipment, combining mandatory information on energy efficiency performances (i.e. energy efficiency labels⁹) and MEPS (Minimum Energy Performance Standards) (17% of measures each).

Programmes (i.e., action plans, combining different measures) correspond to 14% of measures, as well as financial or fiscal incentives.

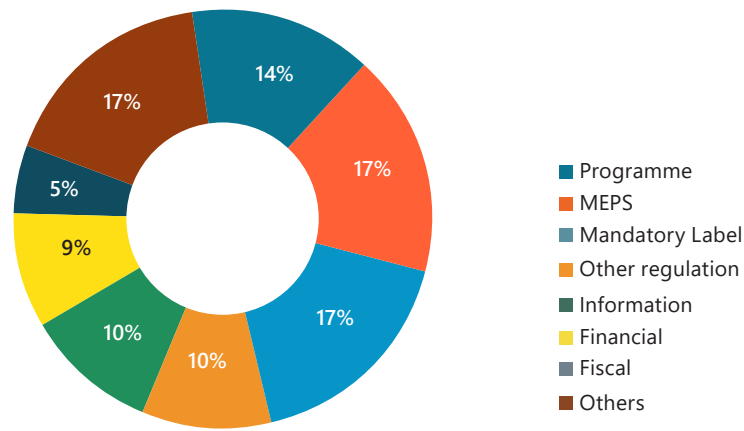
Other regulations (mainly energy efficiency laws) represent 10% of the total, as information measures.

The category “Others” corresponds to all other measures and includes pilot projects, education/training programmes, EE agencies or institutions, voluntary agreements, ESCO and certification among others (Figure 6).

Countries with a large number of measures, such as Uruguay, Mexico, Costa Rica or Brazil have a more balanced mix of the different types of measures, whereas countries with few measures mainly have a greater share of regulations (labels, MEPS and other regulations) and general measures (programmes or others) (Figure 7).

⁹ Most often energy efficiency labels are mandatory: this is why they are classified as regulation. Some countries have however favoured a voluntary approach which is usually just a transition phase before making them mandatory.

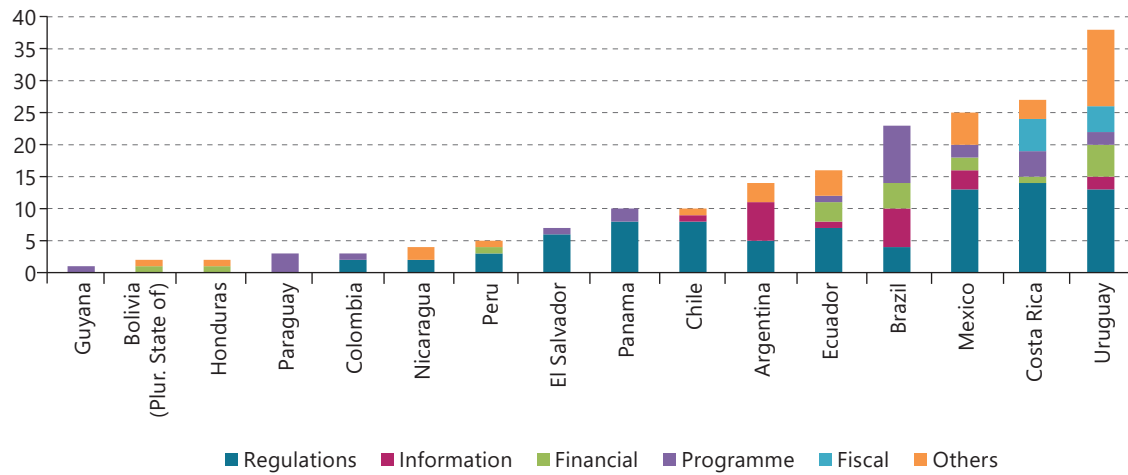
Figure 6
Distribution of all measures by type^a



Source: BIEE Cepal policy database.

^a Including horizontal measures.

Figure 7
Number of measure types by country



Source: BIEE Cepal policy database.

^a Regulations include mandatory labels, MEPS and other regulations.

A. Regulations

1. Energy efficiency labels

Among regulations, energy efficiency labels are widely implemented and are important to guide consumers in purchasing energy efficient products, as they raise their awareness about the energy performance of products by allowing comparison across all models on the market. At the same time, they motivate manufacturers or importers to pay attention to the energy performance of the equipment they sell and to remove inefficient appliances from the market.

Labels are often among the first measures to be introduced, generally for refrigerators and air conditioning, and are then extended later to other electrical appliances (washing machines, TV, pumps, etc.), to lamps and to thermal equipment (e.g. water heater, cooking stove). Labels are now also being introduced for electric motors, cars and buildings.

There exist two main types of energy efficiency labels: comparative labels that enable the consumers to compare with other products on the markets and labels that qualify appliances to be efficient (“**endorsement** labels). Energy labels are mostly **comparative in LACs with two types: a classification by efficiency class with letters (A, B, C, etc.), which is generally the case in LACs, or labels that display the consumption of the appliance and compare it with the standard.**

Endorsement labels are also used in Mexico and Brazil as complement to comparative labels.

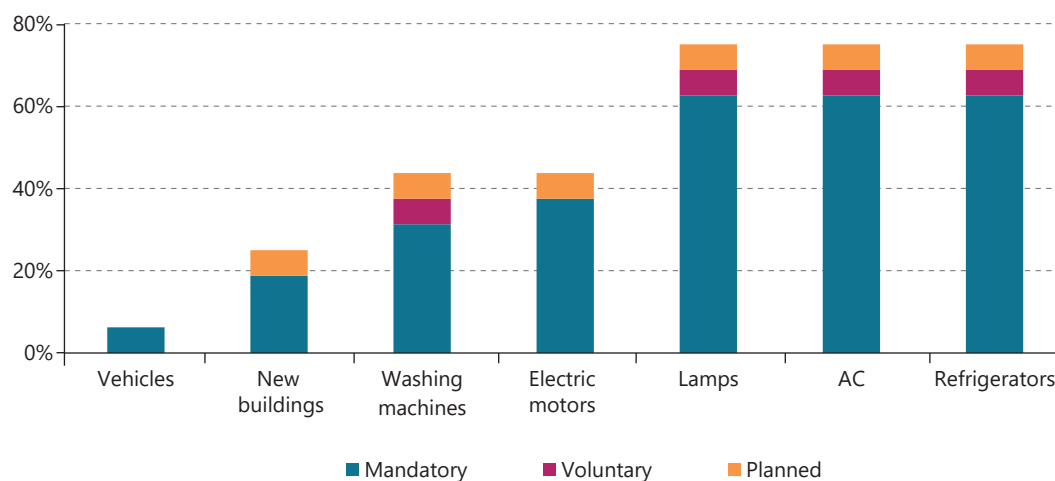
Unfortunately, labels are not sufficient to transform the market alone: they are the first step but need to be complemented with MEPS to remove inefficient equipment and appliances.

2. MEPS

A majority of countries (11) have implemented MEPS on refrigerators, AC and lamps (Figure 8). Electric motors and washing machines have MEPS in 40% of the countries. Efficiency standards on new buildings are implemented in 4 countries and planned in one country.

MEPS are often based on energy efficiency labels in combination with MEPS: the lowest efficiency class is used to set the level of the MEPS.

Figure 8
Share of countries with efficiency standards in LACs by type of equipment (2021)



Source: BIEE Cepal policy database.

3. Other regulations

Other regulations correspond mainly to energy efficiency laws in LACs but also include mandatory requirements for large consumers in selected sectors, such as mandatory energy audits, **energy consumption reporting, energy saving plans or energy managers**. They may also include mandatory installation of solar water heaters, mandatory maintenance and energy savings obligation imposed on utilities. Such mandatory requirements are not common in LACs. Two countries have mandatory **energy consumption reporting (Argentina, Brazil) and one mandatory energy saving plans (Costa Rica)**.

B. Financial incentives and fiscal instruments

Financial or fiscal incentives aim at encouraging investment in energy efficient equipment and processes by reducing the investment cost, either directly (financial incentives) or indirectly (fiscal incentives). Financial incentives include subsidies for energy audits or investments and soft loans¹⁰. Fiscal incentives include tax reduction, tax credit or accelerated depreciation, as well as tax on inefficient equipment (appliances and cars).

Very few LAC countries have implemented financial or fiscal measure: 8 countries have financial measures and Uruguay is the country with the largest number of financial measures (40% of the total). Financial measures are mainly used in services to subsidise efficient public lighting. In two countries, a discount on the electricity bill is awarded to large industrial consumers that invest in energy efficiency (Argentina and Costa Rica).

Only two countries have fiscal measures: Costa Rica (7 measures) and Uruguay (2). Two third of fiscal measures are used to promote electric vehicles.

C. Measures on information

Measures on information and communication are key components of an energy efficiency policy to motivate consumers and inform them about the technical and financial solutions to improve energy efficiency: they represent 10% of all measures. Such information can be disseminated to large consumers through training activities, mainly in industry (e.g. Argentina, Brazil and Ecuador), as well to future consumers in schools (e.g. Argentina, Nicaragua and Uruguay).

¹⁰ Subsidies incentives can be defined as a fixed amount, as a percentage of the investment (with a ceiling), or as a sum proportional to the amount of energy saved. In some case the rate of subsidy can be 100%, especially when the administration or electric utilities distribute free efficient lamps.

II. Institutional context

The institutional setting of energy efficiency policies and the level of commitment of countries to energy efficiency can be characterized by the existence of:

- Energy efficiency laws.
- National energy efficiency programmes with quantitative targets to be achieved.
- Institutions supporting the implementation of programmes, in terms of dedicated national and regional energy efficiency specific institutions (e.g., agencies).
- Other horizontal actions to promote energy efficiency.

A. Energy efficiency laws

One third of countries have an energy efficiency law (10 out of 16), and in two other countries a law has been drafted and is under approval in the Parliament (see Map 1 and 2). In Honduras, such a law has been proposed. The adoption of energy efficiency laws or energy laws with a strong component related to energy efficiency is becoming a common approach worldwide to consolidate the institutional commitment on energy efficiency. A law gives a more durable status to energy efficiency policies and may avoid to a certain extent the stop and go of energy efficiency policies linked to political changes as changing an existing law may be a complex process.

Often these laws provide a legal framework for the adoption of targets (see next sub section) or of other regulations, such as labelling, MEPS, obligations for large consumers. Energy efficiency laws may also provide a legal framework for setting up an energy efficiency fund (see Box 1) and a support scheme for energy efficiency investments, such as the energy efficiency certificate scheme in Uruguay.

Map 1
Energy efficiency law and institutions in LACS



Source: BIEE Cepal energy efficiency policy mapper, see <https://biee-cepal.enerdata.net/policymapper/>.

Map 2
Energy efficiency law and institutions in LACS



Source: BIEE Cepal energy efficiency policy mapper, see <https://biee-cepal.enerdata.net/policymapper/>.

Box 1**Energy efficiency law and energy efficiency fund: case of Uruguay**

In Uruguay, Article 21 of the energy efficient law provides different sources of financing with the energy efficiency fund, called FUDAEE: annual contributions of 0.13% of energy supply companies' total annual sales (electricity, natural gas, fuels and other oil products), 1% of total investment in new power capacity (or capacity expansion) using fossil fuels (excluding cogeneration), collection of fines imposed on inefficient practices, differential tax rates for inefficient products, grants from multilateral organizations, among others. However, present resources of FUDAEE come mainly from the annual contributions of energy supply companies.

FUDAEE is used for various purposes, as defined in Article 19 of the energy efficiency law and later amended in the budget law: finance the energy efficiency certificate scheme, as well as various other activities related to energy efficiency, such as technical assistance, investment projects, research and development, communication campaigns, control and monitoring of energy efficiency labels, including national laboratories ensuring the testing capacities.

Source: Own elaboration.

B. Quantitative objectives of energy efficiency plans

Most countries have a national energy efficiency programme. However only 7 countries have set quantitative targets. In Mexico, the definition of an energy efficiency programme with a quantitative target is included in the energy transition law (Box 2).

Box 2**Energy efficiency target and programmes in Mexico**

The Energy Transition Law (LTE, 2015) mandates CONUEE, the national energy efficiency agency, to propose, evaluate and review a national energy efficiency goal. The LTE established three planning instruments for the energy transition:

- (i) The Transition Strategy to Promote the Use of Cleaner Technologies and Fuels (Strategy).
- (ii) The Special Energy Transition Program (PETE).
- (iii) The National Program for the Sustainable Use of Energy (PRONASE).

The Transition Strategy and PRONASE are the public policy instruments that must prepare each Administration, including a national energy efficiency goal, which is reviewed annually and must be updated every 3 years. The latest version of the Transition Strategy (February 2020) set a goal of reduction of 2.2%/year of the final energy intensity between 2020 and 2035.

Source: Own elaboration.

- Energy efficiency targets can be expressed in terms of:
 - (i) Energy intensity reduction;
 - (ii) Energy consumption reduction compared to a baseline;
 - (iii) Energy savings;
 - (iv) Energy consumption level (i.e. absolute consumption cap).

Most LACs with an energy efficiency target have a target in terms of reduction of energy consumption compared to a BAU scenario (case ii) Table 3. Only Uruguay is really monitoring annual savings (case iii), the savings are calculated year by year by summing the energy savings linked to the different programmes.

Table 3
Energy efficiency targets in LACs

Argentina	Doubling of energy intensity reduction over 2020-30 (1,35%/yr vs 0,68%/yr in BAU).
Brasil	-10% electricity consumption in 2030 (compared to BAU) (-106 TWh).
Chile	-12% in total final energy demand by 2020 (compared to BAU).
Colombia	-10% electricity consumption in 2022 (compared to 2017).
Ecuador	543 Mboe avoided by 2035 (compared to BAU).
Mexico	Reduction of final energy intensity by 2.2%/year over 2020-2035.
Uruguay	5% reduction in energy consumption in 2024 thanks to EE measures (1.69 Mtoe cumulated consumption avoided over 2015-24 (i.e. 45% of 2012 consumption).

Source: BIEE Cepal policy database.

In EU countries, all countries must set up targets of types iii and iv as required by the European Law on energy efficiency (Energy Efficiency Directive)¹¹.

C. National energy efficiency agencies

Only two countries have set up a national energy efficiency agency: Mexico and Chile. Mexico was the first country to set up such an agency, with the creation of CONAEE in 1989, that became CONUEE in 2008. Three countries have a department in the Ministry of Energy dedicated to energy efficiency: Nicaragua, Peru and Uruguay. Two more countries also have organisations dedicated to energy efficiency: Ecuador and Honduras.

The primary objective of energy efficiency agencies is to provide technical expertise to governments and consumers, which cannot always be found in existing institutions. As the lack of quality of energy efficiency equipment and services is often seen as an obstacle to their good diffusion, energy agencies can play a role in that field by certifying (or supervising the certification) those which have the required quality. They can also act as a coordinator of all governmental initiatives in the field of energy efficiency to avoid scattered and uncoordinated actions by different ministries. In particular, the existence of such agencies has proved very useful in negotiating sectoral agreements with groups of consumers, equipment producers or energy utilities to reach specific targets for efficiency improvements. In countries that receive funding from international development assistance programmes, such agencies can in addition act as the national counterpart with whom donors can negotiate the implementation of financial packages for energy efficiency.

D. Other horizontal measures

Other horizontal measures are less common and more diversified among countries and include:

- A fund or budget to support investment or audits (Brazil and Uruguay);
- Energy efficiency certificates: case of Uruguay;
- Energy awards (Uruguay, Mexico, El Salvador);

¹¹ The target iii is known as Article 7 of EED and the target iv as Article 3 of EED.

- A subsidy programme through energy efficiency certificates (Uruguay, see Box 3);
- Other EE institutions: research or study centre on Energy Efficiency;
- Energy savings obligations for utilities (Brazil).

Box 3

Energy Efficiency Certificates in Uruguay to support investment in energy efficiency

The Energy Efficiency Certificates scheme (CEE), that was introduced in 2016 in Uruguay, is a competitive fund mechanism granted by the Ministerio de Industria, Energía y Minería (MIEM) for energy efficiency measures that have been implemented in all sectors (public and private organizations and homes). Every year MIEM opens a call for eligible projects which may receive funds based on the amount of energy saved over the lifetime of the energy efficiency project, that need to be certified by a CMVP (EVO). All types of energy efficiency measures are eligible; for example: solar water heaters, micro generation, replacement of electrical appliances or lamps with a more efficient equipment or lamp (label A), electric vehicles, etc. The reference price of the energy certificate (i.e. its monetary value) is determined each year by the Ministry, based on the funds available in FUDAEE, the national energy efficiency fund, and the energy saving target for that year. The average value of certificates has increased from around 850 UYU (Uruguayan Peso)/toe in 2016 to 1000 UYU/toe in 2019 and 2020^a. The average rate of subsidy^b varies quite a lot from one year to the other: from a minimum of 5% in 2018 to a maximum of 15% in 2019. The variation of this rate depends on multiple factors, such as the types of projects, their size, the fuels.

	2016	2017	2018	2019	2020
Price of CEE (UYU/toe)	848	874	900	1000	1000
Rate of subsidy	13%	14%	5%	15%	8%

Source: Ministerio de Industria, Energía y Minería, Uruguay (MIEM).

^a Around 30 US\$/toe over 2016-2019.

^b Ratio value of certificate received over investment.

Energy saving or efficiency obligation is an innovative measure in which energy companies (supplier/retailer or distributor) have a legal obligation to undertake energy efficiency activities with their customers¹². Such obligation only exists in Brazil where a total budget should be devoted for Demand Side Management programmes implemented by electric utilities¹³ (Box 4).

No country has a tax linked to energy efficiency (energy tax, CO₂ tax). That is common in OECD countries, but often unpopular if not well dimensioned.

Box 4

Energy saving obligation in Brazil: PEE

PEE was implemented in 2000 under the supervision of ANEEL. It required electricity suppliers to spend 0.5 % of their yearly net operating income in energy efficiency projects. Between 2008 and 2012, most projects targeted low-income households. PEE has been adapted several times. As of end of 2019, PEE has saved 63 TWh and 2.8 GW. The average investment in EE projects has been 550 R\$/year.

Source: Energy efficiency policy data base. See <https://www.aneel.gov.br/programa-eficiencia-energetica>.

¹² If this obligation can be met by trading energy saving certificates, this is usually called "White Certificates". In North America it is often called Energy Efficiency Resource Standards.

¹³ <https://biee-cepal.enerdata.net/en/measures/22>.

III. Households and services

A. Labels for households' appliances

Around 70% of countries have labels for households' appliances (Table 4). These labels are mandatory in most countries and the number of mandatory labels for household's equipment is close to 10 in 5 countries. Labelling is well developed for refrigerators and Air Conditioning (AC): they are mandatory in 10 countries, voluntary in 1 and planned in 1 country.

In some countries (Argentina or Mexico) part of the appliances have mandatory labels and others have voluntary labels: the voluntary approach is generally an initial step before making them mandatory. Some countries have labels for thermal equipment, using gas or LPG, such as water heaters or cooking appliances (e.g. Argentina or Mexico). Quality labels also exist for solar water heaters.

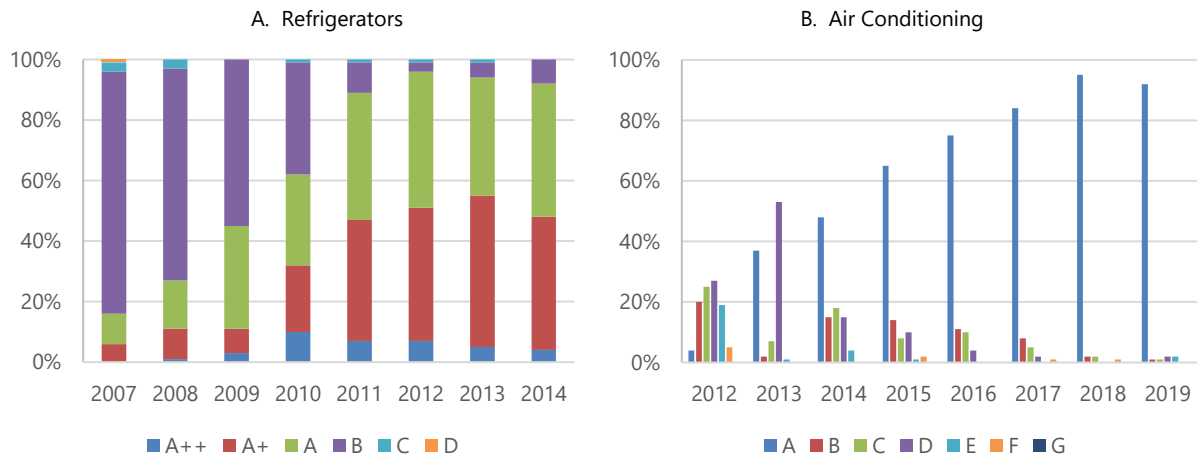
Table 4
Labels for households' equipment in LACs (2021)

	Number of appliances with labels	Labels for refrigerators	Labels for AC	Labels for lamps
Argentina	9	M	M	M
Bolivia (Plurinational State of)	0			
Brazil	9	V	V	V
Chile	4	M	M	V
Columbia	6	M	M	M
Costa Rica	5	M	M	M
Ecuador	9	M	M	M
El Salvador	0			
Guyana	0			
Honduras	0	P	P	P
Mexico	9	M	M	M
Nicaragua	3	M	M	
Panama	3	M	M	M
Paraguay	0			
Peru	9	M	M	M
Uruguay	4	M	M	M

Source: BIEE Cepal policy database; M: Mandatory; V: Voluntary; P: Planned.

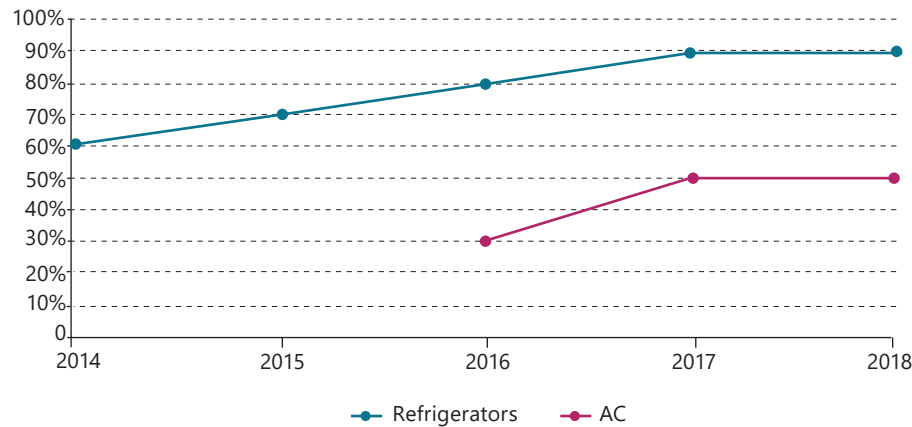
Energy efficiency labels are quite effective as can be seen from the monitoring of the sales of new appliances by label class for refrigerators and air conditioning appliances in Chile: after a few years after the introduction of the labels, the most efficient class dominates the sales (see Figure 9). Besides Chile, Uruguay is also monitoring closely the market share of labelled appliances, which is not the case in all countries (see Figure 10).

Figure 9
Sales of new refrigerators and Air Conditioning appliances in Chile by label class



Source: Ministerio de Energia, Chile, February 2021.

Figure 10
Share of refrigerators and Air Conditioning appliances of class A in total sales in Uruguay



Source: Ministerio de Industria, Energía y Minería, Uruguay, September 2020, First BIEE Meeting.

B. Energy efficiency labels for buildings

Labelling programs are also being introduced for residential buildings: this is the case in 3 countries in LACs (Argentina, Chile and Brazil). Known also as energy performance certificate, these labels are designed to show the energy performance of buildings based on how much they consume. The overall aim is to raise awareness and stimulate the market towards energy efficient buildings. In LACs, Argentina and Chile have

voluntary labels for buildings, characterised by a letter, from A+ or A (most efficient) to G (least efficient), considering 4 end uses: heating, cooling, water heating and lighting. Brazil awards the Procel Seal for buildings when it meets certain requirements.

When it is mandatory the energy rating information must be disclosed during sale and lease. Real estate advertisements are obliged to convey the energy performance information. Implementing a building labelling program is generally a long process as it is necessary to train the work force necessary to design, implement and control the labels. Government and industry associations can facilitate training and ensure future high-quality energy assessments by providing well-designed training and guidance tools and software. Financial incentive schemes may be linked to performance criteria determined by a label.

C. MEPS on electrical appliances

The aim of performance standards is to impose a minimum energy efficiency level of new appliances so as to remove the least efficient products from the market. Around two thirds of countries (11 out of 16) have implemented at least one MEPS (Table 5).

Table 5
MEPS for appliances and lamps

	Number of appliances with MEPS	MEPS for refrigerators	MEPS for AC	MEPS for lamps
Argentina	9			
Bolivia (Plurinational State of)	0			
Brazil	9			
Chile	4			
Colombia	6			
Costa Rica	5			
Ecuador	9			
El Salvador	2			
Guyana	0			
Honduras	0	P	P	P
Mexico	9			
Nicaragua	3			
Panama	3			
Paraguay	0			
Peru	9			
Uruguay	0			

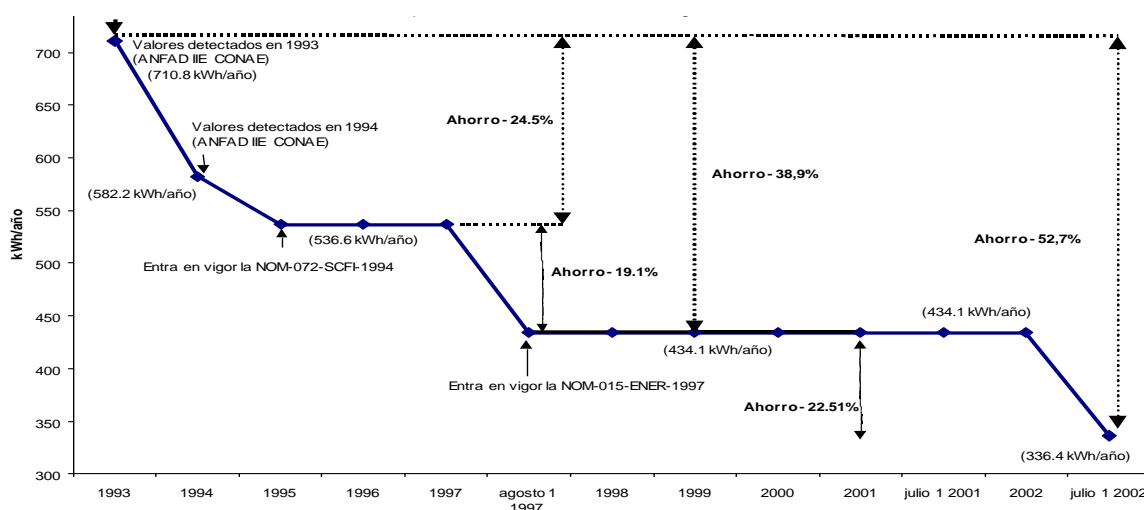
Source: BIEE Cepal policy database; P: Planned.

Air conditioning (AC) is an important use of electricity in the service sector and in the residential sector in some countries and areas. Regulations to foster the adoption of efficient AC have been promoted in many countries. **MEPS** for AC in residential are mandatory in 10 countries (i.e. two third of countries), and planned in 1 country.

Around 75% of LACs have implemented a phase-out of incandescent lighting that are replaced by CFL (Compact Fluorescent Lamps) and increasingly LEDs. Usually, this phase-out is linked to the adoption of MEPS for lighting with different dates of enforcement depending on the size of lamps.

Early implementers of MEPS, Mexico and Brazil, have tightened twice their MEPS for refrigerators and AC since mid 90's (by around 20% each time in Mexico for refrigerators and for the most common AC equipment). According to CONUEE evaluation, MEPS on refrigerators have led to a saving of over 60% in Mexico since the introduction of the first MEPS (Figure 11).

Figure 11
Specific consumption of new refrigerators in Mexico^a



Source: Comisión Nacional para el Uso Eficiente de la Energía, Mexico (CONUEE), 2018.

^a Case of a refrigerator of 284 l.

D. Energy efficiency standards for buildings

Energy Building codes are minimum requirements for energy efficient design and construction for new residential and commercial buildings. Only three countries have implemented such buildings codes: Mexico for non-residential buildings in 1998, Chile in 2000 for all buildings and Ecuador in 2019 for residential buildings. Uruguay is planning to introduce energy building codes for residential buildings.

In principle, the advantage of mandatory requirements compared to voluntary codes is that mandatory enforcement is the only way to guarantee energy savings. In addition, building designers and construction companies are more likely to comply with the code if they know that everyone else must. Finally, manufacturers will provide more widely energy-efficient products if they know that there is a market. Unfortunately, in most countries, building energy codes are not really enforced, for various reasons, such as the lack of expertise of the bodies in charge of control, the facts that standards set at national level while the control is often under the responsibility of local authorities. Although they have been implemented since a long time, standards in Mexico had limited impacts as they do not seem to be enforced, because of lack of control mechanisms.

Buildings codes for new buildings should be regularly revised and upgraded to take into account technical progress¹⁴. To prepare these revisions, many countries encourage construction to go beyond minimum performance requirements with specific labels.

E. Mandatory requirements for some consumers

The main mandatory requirement that has been introduced in LACs in services is the mandatory energy consumption reporting.

Mandatory energy consumption reporting implies that designated large consumers report their energy consumption to the administration. This measure is seen as an incentive to consumers to

¹⁴ In the EU, the EU regulation on buildings («EPBD») requires a revision every 5 years.

monitor closely their energy performance. In some cases, the reporting should also include the energy saving actions that have been undertaken. This measure is mainly applied in public buildings in LACs. Such measure exists in Argentina since 2008 for public buildings (PROUREE, “**Programa de Uso Racional y Eficiente de la Energía**”¹⁵) and in Mexico since 2000 for buildings and vehicles of industrial and services entities of the Federal Public Administration (Programa de Ahorro de Energía en Inmuebles de la Administración Pública Federal, APF)¹⁶.

Mandatory maintenance of energy-consuming equipment is another important field of regulation, which does not yet exist in LACs. The concern is that without a proper maintenance, the efficiency of some energy consumers’ equipment (e.g. boilers, AC systems) decreases over time: the objective of the regulation is to maintain as long as possible the initial efficiency of the equipment. This measure was mainly implemented in EU countries¹⁷. The mandatory technical controls for cars that exist in many countries may to some extent contribute to save energy, depending on the items that have to be controlled.

For solar waters, the lack of regulations, such as obligation of installation, is due to the fact that water heaters are in general less widespread and used less intensively because of a generally warmer climate, except in the southern part of the region (Argentine, Chile, Uruguay and north of Mexico), which make solar heaters less cost effective.

F. Information dissemination

Beyond the traditional information campaigns, new more targeted modes of information and communications have been developed for households and small consumers, such as energy efficiency platforms, information centres and their new form of “one stop-shops”.

To inform households on energy efficiency actions many countries have set up information centres to provide technical solutions. One stop-shops are broader and also provide information on financial solutions as well as on existing public support in terms of subsidies, tax credit or soft loans, information often scattered among different organisations. One-stop shops allow governments or other information providers to provide better and more cost-effective services to their target audiences. These shops can be a physical place in the main cities to be as closed as possible of the consumers or can be virtual (phone or internet services).

¹⁵ <https://biee-cepal.enerdata.net/es/medidas/233>.

¹⁶ <https://biee-cepal.enerdata.net/es/medidas/26>.

¹⁷ The EU directive (EPBD) made mandatory the maintenance of heating boilers and air conditioners above a certain size.

IV. Transport

Measures in transport include car labelling and MEPS for cars and light vehicles. Labels exist in 5 countries, while MEPS have only been introduced in Mexico (Table 6). The fact that MEPS on vehicles are less common is probably due to the fact that in many countries most of new vehicles are second hand imported vehicles which make standard more difficult to implement and control. The other most important measures relate to the promotion of the electrification of transport which represent around half of the measures in transport and are present in only six countries.

Table 6
Energy efficiency measures in transport

	Labels for cars	MEPS for cars	Electrification of transport
Argentina			
Bolivia (Plurinational State of)			
Brazil			
Chile			
Colombia			
Costa Rica			
Ecuador			
El Salvador			
Guyana			
Honduras			
Mexico			
Nicaragua			
Panama			
Peru			
Uruguay			

Source: BIEE Cepal Policy data base.

A. Labels for cars and light vehicles

As for electrical appliances or motors, energy labels aim to increase the number of efficient cars by raising awareness about vehicle energy performance and allowing comparison across all models and technologies. The fuel consumption of cars or light vehicles in kilometre per litre (km/l) are displayed on these labels during sale, with generally a distinction between urban or non-urban driving and an average (mixed cycle).

Five countries have such an energy efficiency label for of cars and light vehicles in LACs (see Map 3): Argentina, Brazil, Chile, Ecuador and Uruguay. They have been implemented for already quite some years in Brazil, Chile, and Uruguay (in 2009 for Brazil, and 2013 for the two others); they are more recent in Argentina (2019) and Ecuador (2021). These labels are mandatory in Argentina, Chile and Ecuador. Costa Rica has implemented in 2019 a mandatory labelling to identify clean vehicles (based on local emissions), which is different from energy efficiency labelling.

Map 3
Energy efficiency labels for cars in LACs



Source: BIEE policy mapper.

B. Electrification of transport

Six countries have implemented measures to promote electric mobility. Costa Rica and Uruguay are the most advanced in supporting the electrification of transport modes in LACs with 8 measures each, combining a mix of fiscal incentives, subsidies and regulations (Table 7). Panama and Ecuador are just starting by designing a national strategy for electric mobility.

Table 7
Measures on electric mobility in Costa Rica and Uruguay

Country	Name of measure	Type
Costa Rica	National Electric Transportation Plan 2018-2030	Programme
Costa Rica	Transition to an electric/ zero-emission vehicle fleet in public sector	Programme
Costa Rica	Law on Incentives and Promotion of Electric Transportation.	Fiscal
Costa Rica	Fiscal incentives for electric transport	Fiscal
Costa Rica	Incentives for used electric vehicles	Fiscal
Costa Rica	Exemption of tax on spare parts for electric vehicles	Fiscal
Costa Rica	Badges for electric vehicles	Information
Costa Rica	Regulation of network of recharging centers for electric cars	Others
Uruguay	Subsidy for replacement of diesel with electricity for buses	Financial
Uruguay	Discount on the registration fee for electric cabs	Financial
Uruguay	Investment Promotion Law - electric vehicles	Fiscal
Uruguay	Reduction of Internal Specific Tax for hybrid and electric vehicles	Fiscal
Uruguay	Tax exemption for vehicles, batteries and electric chargers	Fiscal
Uruguay	Electric mobility rate and commercial discount	Financial
Uruguay	National Electric Vehicle Recharge Network in Uruguay	Others
Uruguay	Reduction of tax for electric vehicles	Fiscal

Source: BIEE Cepal Policy Data base.

V. Industry

The most frequent measures are Minimum Energy Performance Standards (6 countries), followed by energy efficiency labels for electric motors (4 countries) (Table 8). Two countries have **mandatory requirement for large consumers** (energy consumption reporting in Mexico and energy saving plans in Costa Rica). Financial and fiscal measures exist in 2 countries and have ended in three other countries.

Table 8
Overview of measures in industry

	Labels for motors	MEPS for motors	Mandatory requirements for large consumers	Financial/fiscal measures
Argentina				
Bolivia (Plurinational State of)				
Brazil				
Chile				
Colombia				
Costa Rica		V		
Ecuador				
El Salvador				
Guyana				
Honduras		P		
Mexico				
Nicaragua				
Panama				
Peru				
Uruguay				

Source: BIEE Cepal Policy Data base; V: Voluntary; P: proposed; Light Gray: measures implemented but no longer in place.

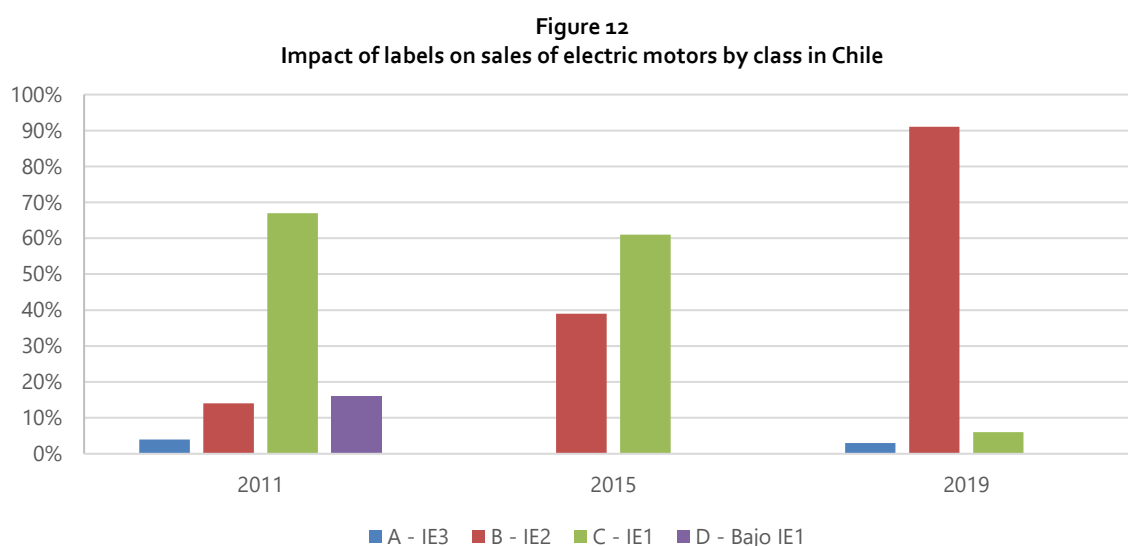
A. Labels for electric motors

Electric motors and electric motor-driven systems (EMDS) in industry absorb almost half of the total electricity use. EMDS are estimated to account for approximately 70% of the electricity consumption in industry. Many policies and measures are in place to increase the efficiency of new motors, in particular

their labelling and the introduction of MEPS. MEPS and labels are usually based on an international classification ranking the motors in several classes from IE₁ (less efficiency) to IE₃ (most efficient).

Energy efficiency labels for electric motors exist in 5 countries (Chile, Brazil, Colombia, Mexico, Peru) and are planned in Honduras. These labels increase the visibility of energy efficient alternatives. Examples of labels are in Colombia (comparative label) and Brazil (Procel Seal, which is an endorsement label part of the Procel Programme).

As for household appliances the impact of labels is quite effective as shown in the case of Chile in figure 12.



Source: Ministerio de Energía, Chile, February 2021.

B. MEPS for electrical motors

MEPS for electric motors have been implemented in 5 countries to remove the most inefficient electric motors and electric motor-driven systems from the markets (Table 8). Voluntary standards exist in Costa Rica.

Mexico adopted the US EPA standard in 1998. Brazil issued the first MEPS in 2002 for standard efficiency motors. MEPS for IE₂ level took force in Brazil in 2009 and Brazil shifted to the IE₃ level in 2017, as well as Colombia (2015). Mexico has implemented NEMA standards since 2016. Other countries with MEPS at the level of at least IE₂ include Chile (2008) and Ecuador (2011). In addition, a few countries have implemented requirements at IE₁ level.

C. Mandatory requirements for large consumers

Mandatory energy consumption reporting in industry exist in Mexico since 2011 for large electricity users in industry (Users of the High Energy Consumption Pattern, UPAC). It has been introduced by the Energy Transition Law and its Regulations: large industrial users must provide annually to the Energy Transition Information System (SITE) of Conuee, the information on their energy use obtained in the

previous year on the energy efficiency measures implemented and the energy savings resulting from the implementation of those measures¹⁸.

Mandatory energy saving plans may also be required for large consumers, generally in industry. In Costa Rica, the Energy Efficiency law imposed on industrial consumers above a certain energy efficiency index such an obligation, as early as 1996¹⁹.

Mandatory energy audits²⁰ do not exist in LACs although they have been widely implemented in Europe and Asia: their objective is to provide consumers a better understanding of their energy use and to identify potential actions for energy savings. In Europe, for instance, the energy efficiency directive has made mandatory energy audits in companies of certain size in industry and services since 2015 (Article 8). This obligation can be avoided by implementing ISO standard 50001 on energy management. Paraguay is considering implementing such a measure.

Mandatory energy managers are imposed in companies above a certain size in industry, in the service sector. Such a measure is not yet in place in LACs.

¹⁸ <https://biee-cepal.enerdata.net/en/measures/96>.

¹⁹ <https://biee-cepal.enerdata.net/es/medidas/61>.

²⁰ Such audits consist of walk-through audits or detailed energy audits. Their impact depends on the implementation of the identified measures audits; in some, exist legal requirements to carry out the measures found. Quite frequently, mandatory audits are accompanied by subsidies for investments and training for auditors and companies' staff.

VI. Conclusions

Around 240 measures have been identified in the 16 countries under review, mostly on energy efficiency. The implementation of these measures has intensified since 2010, as almost three quarters of all measures have been implemented after 2010.

Apart from horizontal measures (i.e. not sector specific), the residential sector is the dominant sector addressed by energy efficiency measures in LACs, with around 40% of all sectoral measures; it is followed by transport and services (around 25% each).

Around one third of measures are regulations on appliances and equipment, combining mandatory information on energy efficiency labels and Minimum Energy Performance Standards (MEPS). Programmes correspond to 14% of measures, as well as financial or fiscal incentives. Other regulations (mainly energy efficiency laws) and information measures represent 10% each of the total.

Very few LAC countries have implemented financial or fiscal measure, apart from Uruguay (mainly financial measures) and Costa Rica (fiscal measures).

Most countries have an energy efficiency law and a national energy efficiency programme. However only half of these programmes have quantitative targets. Only two countries have a national energy efficiency agency: Mexico and Chile.

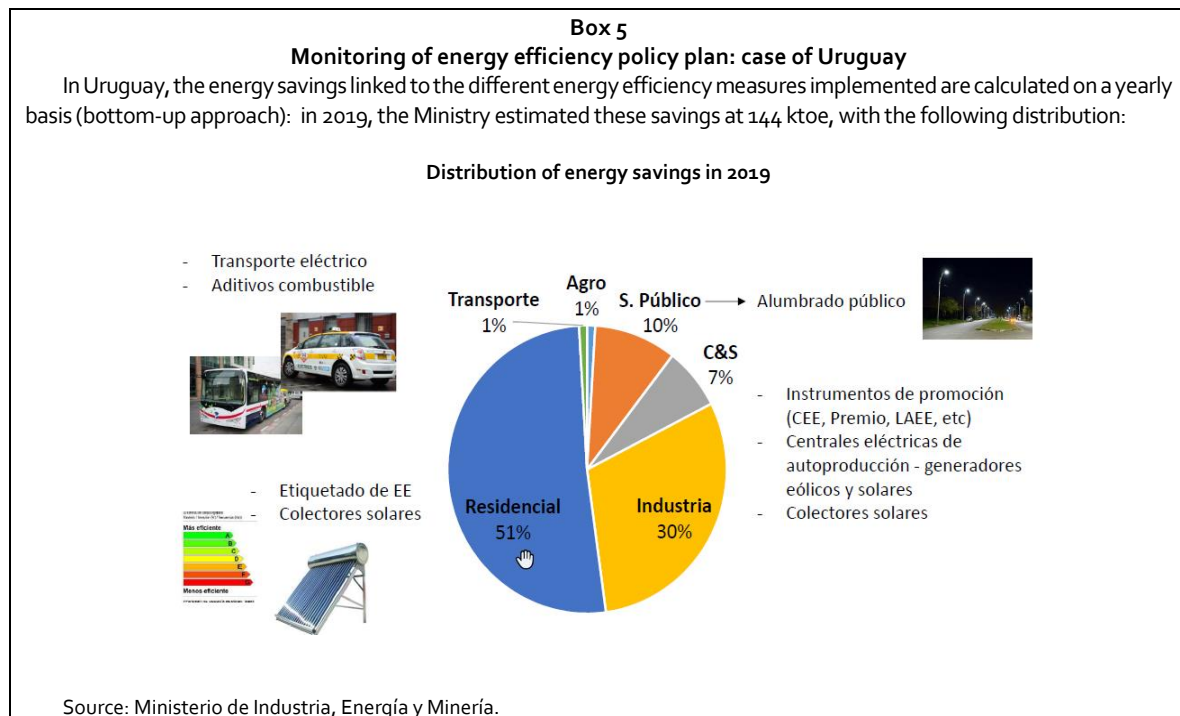
Two countries have set innovative measures: Brazil, with an energy saving obligation for electric utilities that have to invest on energy saving actions with their customers, and Uruguay, with a subsidy programme through energy efficiency certificates.

Around three quarters of LAC countries have labels and MEPS for households' appliances. These labels are mandatory in most countries. The number of household's equipment with labels or MEPS is close to 10 in 5 countries.

Measures in transport include mainly labelling for cars and light vehicles (5 countries) and measures to promote electric mobility (6 countries). Costa Rica and Uruguay are the most advanced in supporting the electrification of transport modes.

The most frequent measures in industry are energy efficiency labels and MEPS for electric motors. Two countries have mandatory requirement for large consumers (energy consumption reporting in Mexico and energy saving plans in Costa Rica).

Monitoring the impact of energy efficiency policies and other policy measures related to SDG 7 is important. Only a few countries have a real monitoring of the impact of the policy measures they have implemented. This monitoring can be done measure by measure or restricted to the main measures (bottom-up estimation) or through an analysis of trends in energy demand related indicators, i.e. energy efficiency indicators (top-down evaluation). Only a few countries are doing a real monitoring of the impact of policy measures, mainly Brazil, Mexico and Uruguay (see example of Uruguay in Box 5).



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