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ECLAC

ECLAC SUBREGIONAL HEADQUARTERS FOR THE CARIBBEAN

# FOCUS

Magazine of the Caribbean Development and Cooperation Committee (CDCC)

## SUSTAINABLE ENERGY FOR ALL IN THE CARIBBEAN



ISSUE 2 / APRIL - JUNE 2016

## ABOUT ECLAC/CDCC

The Economic Commission for Latin America and the Caribbean (ECLAC) is one of five regional commissions of the United Nations Economic and Social Council (ECOSOC). It was established in 1948 to support Latin American governments in the economic and social development of that region. Subsequently, in 1966, the Commission (ECLA, at that time) established the subregional headquarters for the Caribbean in Port of Spain to serve all countries of the insular Caribbean, as well as Belize, Guyana and Suriname, making it the largest United Nations body in the subregion.

At its sixteenth session in 1975, the Commission agreed to create the Caribbean Development and Cooperation Committee (CDCC) as a permanent subsidiary body, which would function within the ECLA structure to promote development cooperation among Caribbean countries. Secretariat services to the CDCC would be provided by the subregional headquarters for the Caribbean. Nine years later, the Commission's widened role was officially acknowledged when the Economic Commission for Latin America (ECLA) modified its title to the Economic Commission for Latin America and the Caribbean (ECLAC).

### Key Areas of Activity

The ECLAC subregional headquarters for the Caribbean (ECLAC/CDCC secretariat) functions as a subregional think-tank and facilitates increased contact and cooperation among its membership. Complementing the ECLAC/CDCC work programme framework, are the broader directives issued by the United Nations General Assembly when in session, which constitute the Organisation's mandate. At present, the overarching articulation of this mandate is the United Nations Sustainable Development Goals.

Towards meeting these objectives, the Secretariat conducts research; provides technical advice to governments upon request; organizes intergovernmental and expert group meetings; helps to formulate and articulate a regional perspective within global forums; and introduces global concerns at the regional and subregional levels.

Areas of specialization include trade, statistics, social development, science and technology, and sustainable development, while actual operational activities extend to economic and development planning, demography, economic surveys, assessment of the socio-economic impacts of natural disasters, climate change, data collection and analysis, training, and assistance with the management of national economies.

The ECLAC subregional headquarters for the Caribbean also functions as the Secretariat for coordinating the implementation of the Programme of Action for the Sustainable Development of Small Island Developing States. The scope of ECLAC/CDCC activities is documented in the wide range of publications produced by the subregional headquarters in Port of Spain.

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**FOCUS: ECLAC in the Caribbean** is a publication of the Economic Commission for Latin America and the Caribbean (ECLAC) subregional headquarters for the Caribbean/Caribbean Development and Cooperation Committee (CDCC).

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**DIRECTOR'S DESK:**

# SUSTAINABLE ENERGY FOR ALL IN THE CARIBBEAN

Access to energy is one of the most serious challenges faced by the Caribbean. As a result, it is important for the subregion to improve energy efficiency as well as to promote the use of alternative sources of energy. Energy efficiency (EE) and renewable energy (RE) are especially relevant to the Caribbean since the subregion holds substantial renewable energy potential in relation to solar, wind and geothermal energy, but remains highly dependent on fossil imports for its energy needs.

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The last decade has seen an impressive evolution in the development and application of energy efficiency (EE) and renewable energy (RE) technologies. For example, in its 2014-2015 report, the International Renewable Energy Agency (IRENA) notes that globally renewable energy power capacity has grown by over 85 per cent over the past 10 years. Additionally, IRENA analyses have shown a decline in the cost of renewable energy technologies by more than 70 per cent over the period, thereby making it possible to provide competitive utility scale electricity services from renewable sources in many countries. In terms of investments, over US \$270 billion were invested in renewable energy technologies in 2014, which represents a 15 per cent increase compared to 2013, and more than five times that of the early 2000s. According to IRENA, the global energy transition has also

stimulated widespread socio-economic benefits, through the adoption of some form of renewable energy technology in 164 countries as at mid-2015, with as many as 7.7 million jobs already created from EE and RE activities as of 2015.

The Economic Commission for Latin America and the Caribbean's (ECLAC) engagement with countries and stakeholders has revealed tangible evidence to show that aspects of this energy revolution are also taking place in our subregion. Antigua and Barbuda recently completed the installation of its first solar power plant, with similar initiatives already operational in Saint Kitts and Nevis, and Aruba. Wind farms already dot the pristine Caribbean landscape in Jamaica, Aruba and Nevis, while both commercial and residential application of solar water heating is common place in Barbados, Saint Lucia and Grenada. The use of mini-hydro power plants is now a proven technology in Saint Vincent and the Grenadines; while Dominica and Saint Kitts and Nevis are on the way to tapping their geothermal sources of energy. The application of Ocean Thermal Energy Conversion technologies is receiving serious consideration in the Cayman Islands, and many other regional economies are already showing signs of gearing themselves to confront these changes.

Countries have also undertaken institutional, regulatory and policy

reforms. Among such adjustments are the decoupling of power generation and transmission in order to accommodate independent power producers; strengthening of utility regulatory frameworks; adjustment of energy metering and pricing strategies; and changes in the fiscal and incentive regimes, especially with respect to energy use for transportation.

While many Caribbean countries have joined the global transition towards sustainable energy, this is such a broad and all-encompassing subject that comprehensive energy policies are required in order to accomplish sustainable and clean energy security. Energy efficiency and renewable energy should be guiding principles to improve the performance of the transport sector, to reassess the process of transportation and distribution of water, to address the complex nature of the water-food-energy nexus and, in general, to improve efficiency in consumption behaviors and production patterns.

In this edition of Focus we highlight three issues of importance to energy efficiency and renewable energy in the Caribbean, namely (i) the importance of energy efficiency policies for the region; (ii) priority strategies to guide the transition to sustainable energy and energy efficiency; and (iii) the progress made in the region based on the experiences of Dominica and Saint

► (continued on page 14)



# PROMOTING ENERGY EFFICIENCY POLICIES<sup>1</sup>

Omar D. Bello

Do Caribbean countries need energy efficiency policies? Most international development institutions have claimed that Latin America and the Caribbean has one of the cleanest energy mixes.<sup>2</sup> in the world.<sup>3</sup> This assessment could lead one to conclude that Caribbean countries do not need to further promote energy efficiency as part of their national energy policies. This conclusion, however, could be misleading. In order to gain a better understanding of the issue at hand, it is worth taking a detailed look at the energy matrix of countries in the Caribbean.

**G**uerra (2016) found the following three stylized facts looking at a case-by-case analysis of the energy matrices of Caribbean countries: (1) most countries in this subregion are net importers of some form of energy; (2) most of the energy supply comes from oil; and (3) energy losses are significant.

With respect to fact one, the total consumption exceeds primary energy supply in every country with the exceptions of Suriname and Trinidad and Tobago. For example, in 2012 the primary energy produced in Trinidad and Tobago was double the amount of its local consumption. This situation is atypical in the sense that the median Caribbean country consumes 25 per cent more energy than its primary supply. As a consequence, it is important to analyze the energy matrix on a country basis rather than as a regional aggregate, in order to ensure that the analysis is not skewed by the case of Trinidad and Tobago (because of its size and unique circumstance).

With respect to fact two, nearly 81 per cent of the energy supply of Caribbean states comes from oil products. Specifically, most energy imports are oil (refined) products. This fact makes Caribbean economies vulnerable to fluctuations in the price of oil on international markets.

With respect to fact three, energy processes in Caribbean countries are inefficient, with energy losses in electricity generation, transmission and distribution processes being quite significant. The production of electricity in the Caribbean requires more “energy inputs” than the Latin American region, (see Espinasa and Humpert, 2013). More energy inputs needed to produce electricity suggest inefficiencies during the process. For the majority of countries in our region of study, losses in the form of heat, waste and other sources exceed 60 per cent of the total amount of energy used to produce electricity for all Caribbean countries, with the exception of Belize.

## ENERGY EFFICIENCY POLICIES IN THE CARIBBEAN

Given the current status of the energy matrix of Caribbean countries, the promotion of energy efficiency policies should be seen as a priority. With this in mind, it is important to understand the experience of the subregion to date in the implementation of these policies.

According to Guerra (2016), on average each Caribbean country (or territory) has one of the following energy policies in place: (a) energy efficiency standards for building construction; (b) tax credits for the adoption of energy efficiency policies; (c) tax reductions/

exemptions; (d) public demonstration (mostly education and awareness); (e) restrictions on incandescent bulbs; and (f) appliance labeling standards. Among these, tax reduction is the most likely, with one energy policy in the planning phase (usually promoting standards for building construction). That is, the typical Caribbean country (or territory) has only considered one out of six possible alternatives to promote energy efficiency within its boundaries, (see Table 1).

Moreover, out of 17 Caribbean countries and territories, four do not have a single policy related to energy efficiency or are in a planning phase, while another four have only given consideration to one policy. It is therefore safe to conclude that in nearly half of these Caribbean countries no energy efficiency policies have been promoted.

include Jamaica and Saint Vincent and the Grenadines, who have at most three policies currently implemented. Six of 16 countries are now considering new measures to promote efficiency in their energy sector, Dominica, Saint Vincent and the Grenadines, and Trinidad and Tobago being those which have the most visible efforts in promoting this type of initiative.

It is also important to note that this situation has evolved in a context of

<sup>1</sup> A This article is based on Sergio Guerra (2016). Energy Efficient Policies in the Caribbean: A manual to guide the discussion.

<sup>2</sup> The energy mix of a country refers to a quantitative representation of all energy available for use in various production processes. A similar concept is that of Total Primary Energy Supply (TPES)

<sup>3</sup> UNDP. (2015, February 24). UNDP, IDB, ECLAC to boost access to sustainable energy in Latin America and the Caribbean. Retrieved December 3, 2015, from [http://www.latinamerica.undp.org/content/rblac/en/home/presscenter/articles/2015/02/24/undp\\_idb\\_eclac\\_to\\_boost\\_access\\_to\\_sustainable\\_energy\\_in\\_latam.html](http://www.latinamerica.undp.org/content/rblac/en/home/presscenter/articles/2015/02/24/undp_idb_eclac_to_boost_access_to_sustainable_energy_in_latam.html)

Table 1: Energy efficiency programs and policies in the Caribbean countries

	Energy efficiency standards	Tax Credits	Tax Reduction / Exemption	Public Demonstration	Restrictions on Incandescent Bulbs	Appliance Labeling Standards
Antigua and Barbuda	Planning	n.a.	n.a.	Planning	Planning	Planning
Aruba	n.a.	n.a.	In place	In place	n.a.	n.a.
Bahamas	n.a.	n.a.	n.a.	n.a.	In place	n.a.
Barbados	Planning	Planning	n.a.	Planning	n.a.	n.a.
Belize	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Cayman Islands	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Dominica	Planning	n.a.	In place	In place	Planning	Planning
Grenada	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Guyana	n.a.	n.a.	In place	In place	n.a.	n.a.
Jamaica	n.a.	In place	In place	n.a.	n.a.	In place
Dominican Republic	n.a.	n.a.	In place	In place	In place	n.a.
St. Kitts and Nevis	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
St. Vincent and the Grenadines	Planning	Planning	In place	In place	In place	Planning
St. Lucia	n.a.	n.a.	Planning	n.a.	n.a.	n.a.
Trinidad and Tobago	Planning	In place	In place	n.a.	Planning	Planning
Turks and Caicos Islands	n.a.	n.a.	n.a.	n.a.	In place	n.a.
Virgin Islands	n.a.	n.a.	n.a.	n.a.	In place	n.a.

Notes: There is no official legislative framework for energy policies in Suriname. n.a. means that this specific policy is neither in planning nor implemented in the specific country.

Source: Guerra (2016) based on the United States National Renewable Energy Laboratory and the International Renewable Energy Agency reports.

increasing oil prices, which is a positive incentive for the adoption of energy efficiency policies. However, following the boom phase of 1995 to 2009,<sup>4</sup> oil prices have declined significantly, with the possibility that countries may no longer be as keen to adopt energy efficiency policies.

In light of the challenges posed to financing RE and EE strategies in the Caribbean (which has been made more difficult by their high debt burden), a strategy to address their fiscal burdens, and at the same time encourage energy policies may be helpful. One approach might be access to International Climate Change Funds. This could provide a welcome opportunity for the Caribbean to mobilize resources for financing energy efficiency projects. For instance, the Green Climate Fund (GCF), which operates within the framework of the United Nations Framework Convention on Climate Change (UNFCCC), was created as a mechanism to assist developing countries in the design of adaptation and mitigation practices to counter climate change. The GCF “will aim for a floor of 50 per cent of the adaptation allocation for particularly vulnerable countries, including Least Developed Countries, Small Island Developing States and African States.”<sup>5</sup> In fact, one of the fund’s investment priorities is to enhance resilience in

Small Island Developing States (SIDS).

According to the fund’s investment policies, its objective is to finance projects and programmes with the potential to promote a paradigm shift towards low-carbon and climate-resilient sustainable development. Additionally, policies mandate that only revenue-generating activities can qualify for loans by the fund. This condition will also improve project efficiency, as Caribbean countries would have to accurately measure the potential impact of their proposals.

## CONCLUSION

The situation of the Caribbean subregion can be described as sub-optimal in terms of its energy matrix, meaning countries are net energy importers, with imports coming principally from crude oil products.

There are also serious inefficiencies related to their processes of electricity production, distribution and transmission, with little or no efforts in terms of promoting energy efficiency policies in the past.

Caribbean countries need energy efficiency policies, and the opportunity for improvement in this regard is considerable. The subregion has a

window of opportunity to re-think and plan strategically its energy sector for the future. In order to transform its energy matrix to one that is greener and more efficient, besides (sizable) investments in the sector, a credible and realistic commitment to develop and to implement a master plan that guides energy policy is also necessary.

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<sup>4</sup> See Acquatella, J., O. Bello, and F. Berrios (2016). *Evidencia estadística de Super Ciclos en las series de precio de los metales y el petróleo 1900-2015*. Mimeo. Natural Resources and Infrastructure Division. ECLAC, Santiago, Chile.

<sup>5</sup> <http://www.greenclimate.fund/ventures/funding#how-it-works> on February 25, 2016.





# PRIORITY AREAS TO GUIDE ENERGY EFFICIENCY POLICIES

Leda Peralta

In 2014, Small Island Developing States (SIDS) adopted the SIDS Accelerated Modalities of Action (SAMOA) Pathway as a guiding instrument to move the Sustainable Agenda forward. Among other issues, the resolution incorporates sustainable energy as one key persisting challenge due to the effects that dependence on imported fossil fuels have on vulnerable economies. In addition, this dependence also hinders efforts to increase resilience to climate change and natural hazards.

**T**he SAMOA Pathway highlights the importance of transformative and innovative measures to increase access to modern energy services, renewable energy and energy-efficient technologies, and to promote low carbon development. The emphasis on these specific components of sustainable energy was later reaffirmed by the Sustainable Development Goals (SDGs) as defined in the document *Transforming Our World - the 2030 Agenda for Sustainable Development*. The seventh goal focuses on affordable and clean energy; and notes that access to reliable and modern energy services needs to be supported by an increased use of renewable energy (RE) sources and improvement of energy efficiency (EE).

Despite the inclusion of sustainable energy in multiple development instruments,<sup>1</sup> access to and promotion of sustainable energy remains a challenge in the Caribbean subregion. Besides dependence on imported fossil fuels and its impact on national finances, which restricts investment capacity, Caribbean SIDS face a variety of technical and regulatory barriers that hinder the implementation of renewable energy and energy efficiency initiatives (see Table 1). The sector also faces governance issues, such as data gaps, ineffective/inadequate policies and regulations, overlapping mandates, outdated/inadequate tariffs, inefficient administration and maintenance, and monopoly over transmission and distribution, which result in some of the highest electricity

Table 1. Energy challenges in the Caribbean.

Technical	Socioeconomic
<ul style="list-style-type: none"> <li>✓ Isolated grid networks</li> <li>✓ Small overall generation capacity</li> <li>✓ Inability to meet existing and future energy demand</li> <li>✓ Outdated equipment</li> <li>✓ Low efficiency</li> </ul>	<ul style="list-style-type: none"> <li>✓ High electricity tariffs</li> <li>✓ Vulnerability to rising, volatile fuel prices</li> <li>✓ Missed opportunities for domestic investment and jobs</li> <li>✓ Energy poverty<sup>a</sup></li> </ul>

<sup>a</sup> Energy poverty is defined as a lack of access to modern energy services. These services are defined as household access to electricity and clean cooking facilities (IEA). The CARICOM Energy Policy was approved during the XLI Special Meeting of the Council for Trade and Economic Development on Energy, held on 1 March 2013 in Trinidad and Tobago.

Source: CARICOM 2013.

Table 2. Regional sustainable energy targets.

Year	Percentage		
	Renewable power capacity	CO <sub>2</sub> emissions reduction	Energy intensity <sup>b</sup>
2017	20	18	??
2022	28	32	??
2027	47	36	33

Source: CARICOM 2013

<sup>b</sup> Energy intensity: measure of total primary energy use per unit of gross domestic product (IEA). The energy intensity target was established only for 2027.

costs in the world, low quality services and high technical and non-technical losses. As a region, the Caribbean has not explored its full potential for interconnection - also affected by small and isolated national grids -, and strategies and policies have not been fully integrated.

These barriers, combined with reduced

investment capacity, have deterred the use of renewable energy and energy efficient technologies notwithstanding the fact that the Caribbean's great potential for using renewable energy sources has been vastly improved and that energy efficiency measures are often referred to as the fifth fuel, as they offer quick and cheap reductions in energy costs.

<sup>1</sup> Energy related issues have been included in the Barbados Plan of Action (1994), the Mauritius Strategy of Implementation (2005), the SAMOA Pathway (2014), and the Sustainable Development Goals (2015), as well as in initiatives such as the United Nation's Sustainable Energy for All (2010).

Therefore, in an effort to benefit from economies of scale, and to address the multiple barriers faced by Caribbean SIDS, in 2013 CARICOM member States adopted an Energy Policy<sup>2</sup> to increase regional cohesion and benefits. The policy established a series of targets that would lead to a sustainable and efficient energy sector (see Table 2).

According to CARICOM (2015), energy efficiency measures should target sectors that: i) account for a large share of the economy's energy consumption; ii) are highly energy-intensive or inefficient; and/or iii) are central to the economy. These three indications are accompanied by a variety of technical and regulatory measures that are further explored in the next sections using the International Energy Agency (IEA) framework, which structures energy efficiency policies into priority areas: (i) cross-sectoral policies; (ii) appliances and equipment; (iii) lightning; (iv) buildings; (v) transport; (vi) industry; and (vii) energy utilities. This is an important framework which can help promote better energy policies in the region.

## CROSS-SECTORAL POLICIES

Cross-sectoral policies require important public involvement since they affect nearly all energy consumption sectors. They are usually related to regulation and to accurately and timely measure the outcomes of energy efficiency policies.

Cross-sectoral policies arise mainly because of standard market failures: time-inconsistent preferences, asymmetries of information, non-competitive markets, externalities and public goods. The International Energy Agency recommends the following actions:

- a. Promote the collection of reliable, timely and detailed data on energy end uses and market technologies.
- b. Regularly update strategies and policies based on up-to-date evidence.

c. Minimize market distortions caused by subsidies and other disincentives to EE and RE.

d. Facilitate private investments in energy efficiency.

The IEA, in collaboration with ECLAC, held the regional workshop Energy Efficiency Policies for Latin America and the Caribbean in 2014, and participants added a few more actions to the list to adjust it to the regional context: (i) strengthen local expertise and capacity; (ii) strengthen coordination and planning between Ministries; (iii) improve quality and availability of data; and (iv) identify financing mechanisms for EE. In line with these recommendations, CARICOM observes that (nationally and regionally) the Caribbean lacks a long term vision with clear and concise implementation mechanisms. Therefore, policies and accompanying instruments remain inadequate as it is difficult to monitor and evaluate progress through imprecise targets and actions. This situation has improved since all CARICOM member States adopted the regional Energy Policy and have designed national energy strategies. However, the situation is not the same for energy efficiency measures, as less than half of CARICOM members have established improvement targets or strategies.

In addition, the Energy Policy aims at strengthening cohesion within the region by establishing common goals and benefiting from a regional approach to sustainable energy. A regional approach has the potential of creating economies of scale, producing energy locally or wherever it is cheaper, promoting investment in EE and RE, and reducing operation costs.

## APPLIANCES & EQUIPMENT AND LIGHTING POLICIES

Policies oriented towards lighting, appliances and equipment, target (but are not limited to) the residential sector

to facilitate the entrance of new energy technologies and to promote the exit of outdated high-energy consuming appliances.

The Caribbean residential sector consumes important volumes of electricity which, combined with inefficient appliances and equipment, exerts additional pressure on already burdened and outdated electric grids. According to CARICOM, appliances are cheap to acquire but expensive to operate, given the lack of efficiency standards in the region.

The incorporation of labels and standards for household appliances and equipments could have multiple benefits in the Caribbean. First, energy-efficient equipments would reduce energy consumption, thus contributing to energy conservation. This is particularly relevant considering the inefficiency of electric grids and the high technical and non technical losses suffered in most Caribbean SIDS, which are then exacerbated by inefficient appliances and equipment. Additionally, the introduction of such practices would encourage widespread use of efficient equipments, contributing to changes in consumption patterns. It is worth noting that labeling should be accompanied by regulations and fiscal incentives that are attractive and user-friendly.

Even though this practice is still incipient in the Caribbean, the region's Energy Policy incorporates numerous activities to promote labeling and efficiency standards for lightning and appliances. Moreover, some CARICOM member States have already started implementing mandatory labeling and standards, and the Organization of Eastern Caribbean States concluded the implementation of the first phase of the Eastern Caribbean Energy Labeling Project in Antigua and Barbuda, Dominica, Grenada, Saint Kitts and Nevis, Saint Lucia and Saint Vincent and the Grenadines.

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<sup>2</sup> The CARICOM Energy Policy was approved during the XLI Special Meeting of the Council for Trade and Economic Development on Energy, held on 1 March 2013 in Trinidad and Tobago.

## PRIORITY AREAS TO GUIDE ENERGY EFFICIENCY POLICIES

Also targeting the residential sector, countries such as Barbados and Saint Kitts and Nevis have established loan programs and/or tax exemptions to promote the use of solar water heaters, which are being widely used in the region.

During the regional workshop on Energy Efficiency Policies for Latin America and the Caribbean (2014), participants identified four recommendations to move this issue forward: “(i) implement mandatory Minimum Energy Performance Standards (MEPS) and energy labels for lighting, appliances and equipment; (ii) phase-out least efficient products through MEPS, taxation, subsidies and regulations; (iii) engage in regional collaboration and harmonization of standards and testing procedures to reduce compliance and testing costs and increase demand for energy efficient products; and (iv) promote market transformation policies.” Furthermore, since lighting tends to be part of an integral design system, building codes that promote the use of natural light should be encouraged.

### BUILDING POLICIES

In 2012, the use of energy in buildings represented 16 per cent of total energy consumption in Latin America and the Caribbean (IEA 2015), and this share is

Additionally, updated and mandatory building codes should guide any new developments and improvements to existing infrastructure.

The CARICOM Energy Policy highlights the importance of establishing efficient building codes as well as performance standards accompanied with incentives to promote use of energy efficient technologies and equipment. However, high initial investment costs and lack of awareness of efficient technologies could hinder the materialization of these savings. In this regard, CARICOM (2015) identified five strategies that could boost improvements in buildings and their components:

- a. Establish performance standards for cheap and readily available technologies, such as cooling, ventilation and insulation systems, and lighting. Besides savings in energy, initial focus on available and simple technologies would encourage further changes in consumption and production patterns.
- b. Simplify permitting procedures by establishing clear guidelines for users.
- c. Implement tax incentives and encourage energy audits.
- d. Fund case studies or pilot projects.
- e. Use post-disaster situations to promote resilient reconstruction

establish a realistic Regional Energy Efficiency Building Code and Minimum Energy Performance Standards in line with the current energy policy. Both instruments are expected to be presented to the Council for Trade and Economic Development (COTED) in November 2017.

### TRANSPORT POLICIES

Transportation policies are complex given the weight of the sector as one of the main consumers of fuel, but also given its interactions with areas such as commerce, manufacturing, and tourism.

Even though transportation accounted for 36 per cent of the total energy consumption in Latin America and the Caribbean in 2012, it remains understudied and there are important data gaps which hamper decision-making and a comprehensive understanding of the sector. In addition, transport-related policies are so varied that they require important investments and systemic changes, such as urban planning, development of public transportation alternatives, establishment of sectoral emissions goals, introduction of tax incentives to promote use of EE vehicles, and behavioral changes. Therefore, the International Energy Agency (IEA) recommendations are

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