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MAKING THE CASE FOR ENERGY EFFICIENCY IN LATIN AMERICA AND THE CARIBBEAN

Opportunities Assessment

THE CASE FOR ENERGY EFFICIENCY POLICY

All economies can benefit from well crafted energy efficiency policies. The countries of Latin America and the Caribbean are no exception but such policies must be tailored to each country, taking into account differences in climate, income levels, and capacity within the energy efficiency ecosystem. According to USAID's Building Blocks for Energy Efficiency report, "energy efficiency policies address market failures that limit adoption of efficient technologies, thereby providing net economic benefits to users while supporting other public goods."

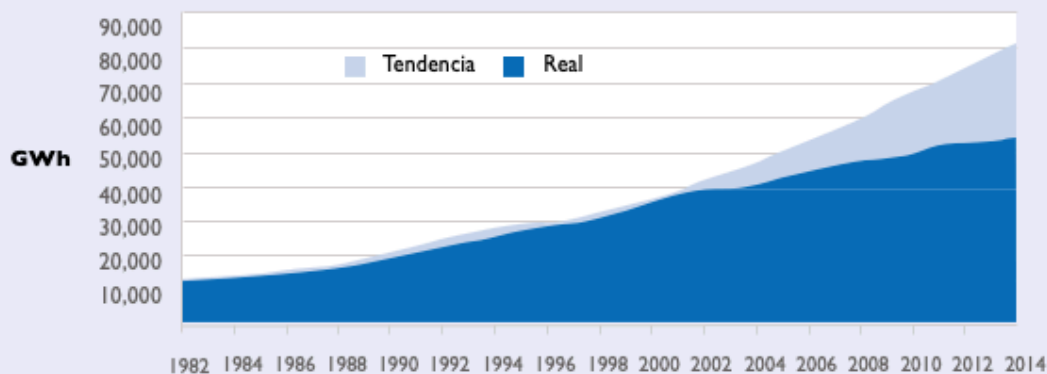
Because most energy efficiency investments occur in individual homes and businesses, major impacts are best achieved through government policies that apply across entire sectors of the economy. Some key benefits (public goods) arising from scaled energy efficiency and distributed energy programs in developing countries include climate change mitigation, economic development, job creation, grid reliability, utility financial health, and energy security. Finally, government energy supply policy is seldom

politically neutral and is often complicated by the dominance of state-run enterprises and energy subsidies. Energy efficiency policy, by contrast, has a long history of being less politically sensitive, thereby posing fewer barriers to government buy-in.

Energy efficiency policies are some of the most effective climate change measures for driving economic development. For this reason, they are particularly well-suited to development aid through technical assistance. For example, energy efficiency codes and standards can drive investments by millions of families and businesses, who also reap the returns.¹ Money invested in high-efficiency appliances, better construction, and improved industrial energy management is directed away from the power sector, which is capital intensive and may require fuel imports. Instead, this money goes to product manufacturers, retailers and small construction firms, and can often create an 'ecosystem' of small businesses around compliance. Furthermore, energy bill savings are distributed back into the economy across all sectors.

SCALED ENERGY EFFICIENCY IMPACTS – MEXICO

Federal energy efficiency policies and programs began in Mexico in the late 1990s with lightbulb substitution programs and minimum energy performance standards (MEPS) for household appliances and industrial electric motors. Since then, many other products have been regulated by Mexico's National Energy Efficiency Commission (CONUEE). A 2016 study demonstrates that Mexican residential electricity consumption growth has slowed since the launch of the energy efficiency program, implying 30% lower consumption levels by 2014 relative to the historical trend.



Source: CONUEE – "Análisis de la evolución del consumo eléctrico del sector residencial entre 1982 y 2017 e impactos de ahorro de energía por políticas públicas"

¹ Unlike many regulations, compliance with energy efficiency rules produces a positive return on investment from energy savings that is guaranteed for most consumers through the intelligent design of technical standards. Identification of standards that produce the greatest net return on investment is a common topic of technical assistance.

FACTORS DETERMINING EE INTERVENTIONS IN LATIN AMERICA AND THE CARIBBEAN

Energy efficiency potential is high throughout Latin America, but the choice of next step is as varied as the countries themselves. In Latin America, Mexico serves as a model where a combination of political commitment, institutional capacity, and international technical assistance have worked together to achieve real and lasting energy efficiency successes.² Recognizing the achievements made in appliance efficiency in Mexico, USAID is now pursuing energy efficiency construction codes, voluntary building retrofits, and industrial energy efficiency, with an emphasis on sub-national engagement. Many of the factors at play in Mexico are also relevant to the rest of the region, but a sub-regional or country-specific approach will yield the best results. The following main factors drive country-level optimization of the energy efficiency portfolio.

Local Climate - In Latin America, where heating loads are low, it is often technically possible for buildings to produce more electricity than they consume, through a combination of optimal shading, orientation and insulation to reduce cooling loads, and installation of high-efficiency technical equipment and solar panels to cover the remaining load. In tropical, hot, and arid regions, the challenge will come mainly from reducing demand from air conditioners. This can best be done with an integrated approach, which includes a combination of equipment standards and

incentives, along with construction regulations and retrofits to insulation, weatherstripping, and shading.

Mean Income - A second important consideration in pursuing energy efficiency measures in LAC is the varying levels of country development in the region. In a low-income country like Haiti, for example, programs may focus on light bulbs, which are accessible to most people, whereas major appliances may be more relevant in a mid-income country like Uruguay.

- In very low income countries, households may only use a few appliances (e.g. lighting, television, and cell phone charger) and/or may lack grid access. In this case, off-grid solar systems combined with super efficient equipment may provide the greatest development benefit.
- Higher income populations may have the ability to purchase high-efficiency equipment with little financing support. In this case, regulations and rebates may be sufficient to transform markets.
- Appliances like refrigerators may be built domestically in large more economically-developed economies, so these manufacturers are key stakeholders in any process. Less-developed economies, on the other hand, rely on imports and therefore benefit from alignment with trading partners.

Capacity Considerations - Human capacity in the energy efficiency ecosystem correlates closely with economic development but implies

² Chile has also been highly ambitious and successful in implementing energy efficiency policies and programs




REGIONAL OPPORTUNITIES IN CENTRAL AMERICA AND THE CARIBBEAN

- The Mesoamerican Program for the Rational and Efficient Use of Energy (PMUREE) originated as a private sector initiative with support from the Mexican Government as part of its “Proyecto Mesoamericano.” PMUREE integrates 10 countries of Central America plus Mexico, Colombia, and the Dominican Republic. PMUREE is coordinated with SICA and primarily provides technical assistance on the topic of technical standards, as well as finance mechanisms, public sector retrofits, strengthening of institutions, energy management systems, capacity building, and transport. PMUREE has provided technical assistance for energy efficiency standards for refrigerators, air conditioners, and lighting throughout Central America, but is currently not funded.
- In a similar way, the Caribbean Centre for Renewable Energy and Energy Efficiency (CCREE) works through the regional policy and trade coordination entity CARICOM to support development of clean energy programs and policies throughout the region. CCREE partners with technical institutions such as the U.S. National Renewable Energy Laboratory (NREL). Similarly, the CARICOM Regional Organization for Standards & Quality (CROSQ) coordinates energy efficiency standards within CARICOM. Activities of these two organizations have included major energy efficiency policies, including minimum energy performance standards for appliances, and energy efficient construction codes for commercial and public buildings.

distinct consideration for technical assistance. Even where energy efficiency laws exist, government agencies mandated to implement them may be understaffed and lack political influence. Product testing laboratories may be scarce and a private industry of energy efficient construction may be lacking. Technical assistance plays a critical role in filling these gaps, but must be appropriately deployed, since partner agencies lack capacity to absorb it. In this case, initiatives will lack sustainability. One strategy to counter this is to build capacity within local academic institutions and consultants, who may carry the ball once the development support has ended. Finally, political will and priority of climate and energy efficiency policy are key enablers of successful energy efficiency programs. Technical assistance should include analysis and communications that communicate benefits and foster political support.

ENERGY EFFICIENCY TECHNICAL ASSISTANCE TOOLKIT

In order to highlight opportunities for technical assistance deployment and illuminate best-practices strategies and potential barriers to implementation of energy efficiency policies and programs in developing countries, USAID's [Energy Efficiency for Development](#) program developed a [toolkit](#) based on eight "building blocks" which are highlighted below.

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|  <p>ENERGY EFFICIENCY STANDARDS AND RETROFITS Include evaluation of market dynamics, regulatory costs and benefits, development of technical standards and stakeholder engagement.</p> |  <p>MARKET PRIMING AND FINANCING Kick starts markets for high-efficiency technologies by creating economies of scale and facilitating reduction of costs to end consumers.</p> |  <p>POLICY PLANNING Integrates energy efficiency into national power development and integrated resource plans, enabling targets and strategies for low emissions development strategies (LEDS), and implementation of Nationally Determined Contributions.</p> |
| <ul style="list-style-type: none"> • Equipment Performance Standards • Building Codes and Public Sector Retrofits • ISO 50001 and ESPC/ ESCOs | <ul style="list-style-type: none"> • Bulk Procurement • Incentive Programs • Efficiency Funds, Low Income and Small Business Programs | <ul style="list-style-type: none"> • Energy Efficiency Policy Prioritization and Road-mapping • Energy Efficiency Resource Planning |

THE ENERGY EFFICIENCY OPPORTUNITY IN ECUADOR

In Ecuador, significant progress has been made in establishing the legal framework for government-led energy efficiency programs and policies. A National Plan for Energy Efficiency (PLANEE) 2016-2025 was developed with technical assistance from the Interamerican Development Bank (IDB) and then integrated into the larger Electricity Master Plan. The Ministry of Energy and Non-Renewable Resources (MERNNR), which has authority to implement the PLANEE, estimates savings of 84 billion USD and reduction in GHG emissions of 65 MtCO_{2e}. So far, the PLANEE includes actions in replacement of domestic appliances, street lighting retrofits and voluntary adoption of Energy Management Standards (ISO 50001) in the private sector. Ecuador has a labeling program for domestic appliances, but the definition and enforcement of efficiency standards is unclear. There are as of yet no mandatory energy efficiency construction codes in Ecuador.

¹ <https://www.cnelep.gob.ec/plan-nacional-eficiencia-energetica/>

² A successful refrigerator substitution program (RENOVA) replaced around 100,000 refrigerators

All of the Building Blocks are applicable to Latin America broadly, and should be considered in the following order:

- **Program Design Assessment** - This critical preliminary step guides technical assistance programs towards the most impactful building blocks and identifies the most effective barriers to target. It answers questions about the GHG mitigation, economic development benefits and equity concerns related to each program activity, and seeks to maximize the ability of technical assistance to be the determinative factor for progress.
- **Equipment (Appliance) Performance Standards** may be the lowest-hanging fruit for LAC countries where they have not already been fully implemented and therefore always merits consideration as a first step. Most LAC governments have articulated energy efficiency goals, but have not fully implemented them,³ possibly due to a lack of capacity or political priority in the implementing agency. Existing

³ In Ecuador, for example, although restrictions on imports of inefficient refrigerators is in place, a study by LBNL in 2019 found that this standard is less stringent than Mexican requirements of a decade ago.

regulations can be strengthened through technical assistance. Appliance standards usually yield the highest leverage of energy efficiency policies - leveraging program costs by many orders of magnitude through distributed investments of millions of consumers.⁴ Emphasis should be placed on costs and effectiveness of certification and enforcement. Advancements in this area vary greatly by country, and more advanced governments can serve as regional leaders, especially between trading partners.

- **Energy Efficiency Funds** targeted at low-income households and small businesses are a direct economic aid to disadvantaged and vulnerable communities. Financing support in this type of program are among the most effective job creators of any climate policy⁵ and the potential exists to leverage government financing programs, USG resources (e.g. DFC) and development banks.
- Filling gaps in **Policy Prioritization and Roadmapping**, if combined with communications and diplomatic support, can

JOB CREATION - Manufacture, installation and inspection of energy efficiency technologies creates jobs in the manufacture of appliances and materials, or in the design, construction, renovation and certification of low-emissions buildings and facilities. A growing body of evidence suggests that these are among the most job-intensive of government economic stimulus investments. For example, a program to replace household refrigerators with newer, more efficient ones in Mexico between 2009-2018 is estimated to have created 1600 new permanent and 10500 new temporary jobs*. Building retrofit programs are even more effective, with each dollar invested creating employment at a rate of about the local rate of labor productivity. This implies that \$1 million invested in this area creates roughly 60 jobs in Colombia, 90 jobs in Ecuador and 200 jobs in Honduras**.

*IEA (International Energy Agency). 2020. Sustainable Recovery. World Energy Outlook Special Report. Paris: IEA. <https://www.iea.org/reports/sustainable-recovery>.

**Based on analysis from the Global Green Growth Institute (2015) combined with International Labour Organisation statistics

bolster key institutions and increase the ambition in NDCs and other high-level policies. While this can be done in tandem with other assistance providing short-term benefits, it should be done early in the program in order to maximize benefits.

- **Industrial Decarbonization** can bring together sector-specific technical assistance and financing initiatives, working with individual firms or industry chambers to implement cost-effective technologies in large emitters. These programs can target heavy industry, such as iron and steel or cement, or take a broad approach of energy management training across industrial sectors, using a framework such as international standards (e.g. ISO 50001).
- **Building Codes** act at scale and transform the built environment for years to come, but rely on a sound infrastructure of regulations and permitting and inspection, usually at the municipal level. These are most appropriate in cases where technical codes are well-established, and sufficient capacity exists to enforce them. In this case, technical assistance helps to fill capacity gaps through training of regulators as well as SMEs in the construction and certification industry.
- **Financial Incentives and Rebate Programs**, if well-designed, can propel markets for higher-efficiency equipment and construction, and can create economies of scale that lower costs, thus enabling the next generation of regulations.
- **Public Sector Retrofits** signal leadership and the technical tools applied can be shared with the private sector in order to build capacity there. These programs can leverage financing programs, particularly international development banks such as the IDB and World Bank.

4 For example, USAID technical assistance to South Africa on appliance standards of about \$500k was found to drive over \$1B in investment by consumers over the next 10 years.

5 See, for example, the Global Green Growth Report at https://www.unido.org/sites/default/files/2015-05/GLOBAL_GREEN_GROWTH_REPORT_vol1_final_0.pdf.