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Stimulating the Market: Incentives for Cleaner Production and Energy Efficiency in Latin America

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Abstract

Resource efficiency, including cleaner production and energy efficiency (CP/EE), is thought to be an important strategy for developing countries to grow their economies in a sustainable manner. However, in many regions the private sector, particularly smaller enterprises, has been reluctant to adopt such strategies due to a combination of informational, technical and economic barriers. A variety of players in Latin America, including international aid agencies, governments, banks and national cleaner production centers, have introduced market-based mechanisms to encourage enterprises to adopt resource efficient practices. In this paper, we conduct a comparative analysis of the availability and utilization of different types of market-based instruments for cleaner production and energy efficiency in micro, small and medium size enterprises in Central America. We surveyed 19 programs in 5 countries (Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua) to examine how effectively these instruments are being utilized, complementary barriers that prevent their adoption, and best practices for increasing their uptake. We find that most programs are focused on energy efficiency, are financed by international donors, offer grants and awards to companies for pursuing CP/EE, but are not specified towards MSMEs.

Keywords: cleaner production, resource efficiency, Small and Medium Enterprises, market-based mechanisms, energy efficiency

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1. Introduction

The transition to sustainable development emphasizes the advancement of human well-being over multiple generations and preservation of the ecological capacity of the regions where those humans live. Most countries in Latin America and the Caribbean (LAC) are projected to grow steadily in the near future but are challenged to do so sustainably because of concurrent increases in industrial pollution, resource depletion and human exposure to harmful substances.

Micro, Small and Medium Enterprises (MSMEs) are of particular importance in developing regions because they are an engine of economic growth. They constitute 99% of the companies in Latin America and the Caribbean, account for 30% of the region's GDP, and represent 67% of the employed population (OECD 2012). Small quantity generators (SQG), like MSMEs, have faced less scrutiny for environmental enforcement because individually they pollute a little, though these amounts may be quite large in the aggregate (de Cerreño et al. 2002). Thus, addressing environmental challenges among them is a non-trivial matter that is necessary to realize a sustainable transition in the region.

Resource efficiency can play a critical role in Latin America's future sustainable growth. For two decades both government and non-governmental agencies in the region have promoted such strategies to help companies reduce their environmental impacts while improving their economic performance. Economic instruments, such as pollution taxes, subsidies and lending programs are designed to encourage companies to implement environmentally-sound practices by lowering the required investment or offering other economic benefits to those who implement them. However, many businesses, particularly MSMEs, have been reluctant to implement resource efficiency practices because they were perceived to be more problematic or less profitable than other types of investments. As governments and others introduce policies and programs to engage MSMEs in resource efficiency, they need to be cognizant of the barriers MSMEs face in adopting them.

This paper presents a comparative analysis of how market-based mechanisms are being utilized to engage MSMEs in resource efficient practices across Central America. We investigate the availability and uptake of existing public and private sector incentive programs for energy efficiency and cleaner production in five countries: Costa Rica (CR), El Salvador (SV), Guatemala (GT), Honduras (HN), and Nicaragua (NI). The paper proceeds with a literature review, followed by the methodology and findings on their availability and uptake. We then discuss the results and make recommendations to improve uptake of these incentives by smaller enterprises.

2. Literature review

2.1 Cleaner production and energy efficiency in Latin America

Cleaner Production (CP) is an "integrated preventative environmental strategy" through which companies continuously apply a variety of tools to improve resource efficiency, minimize risks and environmental impact, and reduce waste and costs (UNEP 2015). Energy efficiency is one dimension of CP (at times treated independently of CP) that focuses on increasing the amount of useful output per unit of energy input. With rising fossil fuels' prices and concerns about climate change, energy efficiency has risen in importance, as it has come to provide the most direct and immediate savings for companies that institute these practices.

Cleaner production has been promoted since the early 1990s in Latin America and the Caribbean, as well as other industrializing regions (Van Berkel 2010). The United Nations Environment Programme (UNEP), United Nations Industrial Development Organization (UNIDO), and several OECD governments were instrumental in the creation of National Centers of Cleaner Production (NCPCs) that are focal points for CP activities in thirteen countries throughout the region (UNEP 2015). Their main activities include information dissemination, awareness building, training, CP assessments, policy advising, and

technology transfer. MSMEs have been a critical target group for CP in Latin America as they lack the knowledge, human and financial resources to fully implement CP strategies on their own (Van Berkel 2010).

There have been numerous CP promotion and demonstration projects in Latin America and the Caribbean as well as a variety of financing programs to encourage smaller enterprises to invest in CP/EE (IOEW and UNIDO 2009). However, even after being exposed to successful cases, MSMEs have been hesitant to pursue such strategies. Williamson et al. (2006) posit that SMEs¹ will green their operations only if they are required by regulations or if there are obvious cost savings, customer requirements or efficiency needs. MSMEs decision to invest in CP may be constrained by supply and demand conditions. On the supply side, there has been limited availability of technical and financial assistance to help companies identify and fund CP initiatives (Ashton et al. 2002). Supply may be constrained by a lack of in-country funding, administrative costs for managing small loans, competing priorities for government policies and private sector funding, and stringent rules for disbursing funds. On the demand side, many SMEs may be unaware of or unwilling to seek financing options available to them. A majority of SMEs surveyed by the World Bank opt for financing investments from their own internal resources rather than seeking external financing (Gregory 2013). Their unwillingness to seek external capital arises from: a) lack of tangible equity to leverage by borrowing; b) lack of collateral; c) unwillingness or inability to provide proprietary or revenue information (for fear of being taxed); and/or d) risk aversion (Gregory 2013). The World Environment Center (WEC) reports that Central American MSMEs typically require very small investments for CP projects (less than US\$10,000), which suggests that these amounts are not large enough to be attractive as loans to private lenders (WEC, unpublished data). While both supply and demand aspects need to be addressed in order to stimulate the greening of MSME operations, in this article we focus on the supply side.

2.2 Market-based mechanisms for promoting resource efficiency

Increasing recognition of the external social and environmental costs imposed by industrial activities has pushed governments to create regulations and policies that require private companies to reduce those costs. Market-based mechanisms are economic instruments that give private companies greater flexibility to internalize the external costs of their operations.

Regulatory entities have the capacity to increase market efficiency through price signals seeking to correct market distortions resulting in environmental damage. Typical measures to discourage environmental externalities include pollution taxes, charges and fees (e.g. water charges above usual demand to encourage resource conservation). Other mechanisms aim at offsetting short term pricing distortions that prevent the adoption of sustainable practices, such as grants, awards and preferable purchasing agreements that give incentives to those actors engaging in the activities being promoted (e.g. CP). Tax deductions and depreciation allowances also provide incentives to change inefficient equipment faster. Additional financial instruments include lending (credit borrowing and loans) by banks and other financial institutions, which many argue can more cost effectively and efficiently provide financing to companies for investing in clean production and energy efficiency initiatives.

In 2009, UNIDO completed a comprehensive study on financing mechanisms for cleaner production and environmentally sound technology (CP/EST) in SMEs around the world. Latin America featured prominently in their study as the region was observed to have more funding opportunities than others. These mechanisms included government tax incentives for purchasing clean technology (exemption from customs duties or value added tax), special CP/EST funding offered by private banks and governments, as well as general credit lines for small businesses offered by banks. Special funding

¹ The term Small and Medium Enterprises (SMEs) is also used in this article when referring to other studies that focused on SMEs, our own work includes micro enterprises.

schemes for cleaner production and environmentally sound technology were available Bolivia, Brazil, Colombia, El Salvador, Honduras, Mexico, Peru, Paraguay, but not Guatemala and Nicaragua, but they were under-utilized by SMEs (IOEW and UNIDO 2009)². Difficulty in obtaining funding was most closely related to a lack of information on funding options and appropriate financial and accounting systems. More generally, the lack of business registration and collateral, as well as inadequate accounting systems and poor preparation of financial proposals are important barriers to SMEs accessing financing (OECD 2009). As such, they recommended that highlighting return on investment and price signals were most important to gain the interest of SMEs, and that funding opportunities must be identified as part of CP technical consulting services.

3. Methods

The objective of the study was to perform a comparative analysis of the uptake of market-based mechanisms for cleaner production and energy efficiency among MSMEs in Central America. Through this research we sought to identify:

- trends and best practices throughout the region for incentivizing smaller enterprises to incorporate environmentally-sound, energy efficient and cleaner production practices,
- challenges that implementing organizations face in developing and managing such programs, and
- strategies for improving the uptake of market-based incentives among smaller enterprises.

After conducting internet-based and in-country secondary research to identify active programs offering market-based mechanisms for financing or rewarding CP/EE, we consulted with staff at the NCPCs³ to verify that the list of such programs were currently active and to gather points of contact for those organizations. We categorized the programs by country, types of incentives provided companies supported, and targeted projects. The initial list consisted of 33 programs and twelve were eliminated as they do not provide market incentives (funding or other economic benefits), have no environmental attributes in the selection criteria for rewarding applicants, or are not currently operational.

We then designed a standard questionnaire (see Appendix I) in English and Spanish to collect detailed information about the programs, such as number and size of recent applications and awards, outreach strategies and respondents' opinions on the performance, challenges and future of such program. The authors then sent the questionnaires to program managers for the identified programs in their respective countries. They conducted in-person or telephone interviews with these representatives to complete the questionnaire. The quantitative and qualitative data were then compiled, independently coded, compared and analyzed to identify trends and patterns across the programs. The small number of programs surveyed limited the quantitative analysis to descriptive statistics of the data.

4. Results

We interviewed personnel from nineteen programs in Central America. The results are divided into three sections that: 1) compare the programs' characteristics, 2) examine programmatic activities and disbursements to individual companies across all programs over the last five years, and 3) provide interviewees' reflections on the barriers, challenges and outlook for the programs.

² No respondents from Costa Rica in this survey, so no information about available programs there were included in the report.

³ Two of the co-authors (YST and MU) are employed by National Cleaner Production Centers (in SV and NI, respectively) and had direct access to information about funding programs in which their organizations have a role. In the other countries (CR, GT and HN) the local co-authors contacted the NCPC for this information.

4.1 Characteristics of the Surveyed Programs

Table 1 summarizes the characteristics of the nineteen programs, including the size and source of funds available, and the criteria for selecting awardees. Two programs focusing on energy efficiency were active across all five countries: the Central American Bank for Economic Integration's (BCIE) MiPyME Verde and the Inter-American Investment Corporation's GreenPyMEs. However, we were only able to interview personnel from the MiPyME Verde program in three countries (SV, GT and NI), while the representative from GreenPyMEs in El Salvador provided information for all five countries. Twelve of the programs indicated that they were specifically targeting support to MSMEs, and the others while not geared towards MSMEs could include them. However, even those programs that indicated a focus on MSMEs also funded activities in larger enterprises. Seven of the programs were grant programs (G), offering funds to purchase clean technology or offset the cost of technical assistance or audits (TA). Eight offered lines of credit (LC), which enable enterprises to more easily borrow money to finance their CP activities. Four were award (A) programs giving recipients public recognition for their CP/EE efforts, and in some cases, cash prizes. Almost all the programs (16 of 19) were started after 2010, with three started in the mid-2000s - the National Cleaner Production Award in Nicaragua (2006) and MiPyME Coffee Excellence Cup in Honduras (2004), and one financing program El Salvador Development Bank (BANDESAL)'s Renewable Enterprise program (2006).

Seven of the nineteen programs are directly related to energy (EE or RE). Only two programs are directly focused on CP, both in Nicaragua, though one of these (National CP Award) only provides recipients with recognition and the use of a "green seal" and no financial benefits. Three programs, all in Costa Rica, explicitly include both CP and EE among other environmental initiatives that are eligible for financing. Seven of the programs focus on technology changes, and nine include efficiency improvements, while one program focuses on product improvements and one other on broader sustainable development goals.

Table 1. Comparison of market based mechanism programs in countries

Country	Program Name	Sponsoring Organization	Year Started	Activities Supported	Mechanism	MSME Focus
CR, SV, GT, HN, NI	GreenPyMEs	Inter-American Investment Corporation (IIC)	2010	EE	G/TA	Yes
CR	Eco-credit for individuals	Banco Popular	2012	EE/CP/ Other	LC	Yes
CR	Eco-credit for business	Banco Popular	2014	EE/CP/ Other	LC	Yes
CR	Grow SMEs	Bancredito SMEs Center	2011	EE/CP/ Other	LC	Yes
CR	Green SMEs	National Bank of CR	2014	Sustainable Dev.	LC	Yes
SV	MiPyME verde	Central American Bank for Economic Integration (BCIE)	2011	EE and RE	G	Yes
SV	Renewable enterprise	El Salvador Development Bank (BANDESAL)	2006	Greenhouse Gas Rdxns.	LC	Yes
SV	National Energy Efficiency Award	National Energy Council (CNE)	2013	EE	A	Yes
GT	MiPyME verde	Central American Bank for Economic Integration (BCIE)	2011	EE and RE	G	Yes
GT	Structured Finance for Debt or Investment	Grupo Financiero Occidente	2012	Clean Energy (EE/RE/Agroforestry)	LC	No

GT	Carbon Credit Transactions & Financing	Grupo Financiero Occidente	2012	Carbon Credits	LC/CC	No
HN	Strengthening the value chain	Honduran Foundation for Corporate Social Responsibility (FUNDAHRSE)	2012	Corporate Social Responsibility	G/TA	yes
HN	MiPYME Coffee excellence cup	IHCAFE & Alliance for Coffee Excellence	2004	Product Improvement	A	No
NI	MiPyME verde	Central American Bank for Economic Integration (BCIE)	2011	EE and RE	G	Yes
NI	Green Credit	Banco ProCredit	2013	EE and RE	LC	Yes
NI	Chemical Leasing	United Nations Industrial Development Organization (UNIDO)	2010	Chemical Leasing	A	No
NI	COPLAN	German Federal Enterprise for International Cooperation (GIZ)	2013	Competitiveness and Green Technology	G	No
NI	National Cleaner Production Award	Government of Nicaragua	2006	CP	A	no
NI	Ometepe Eco-efficiency grants	Multilateral Investment Fund (MIF)	2013	CP	G	No

Notes: Programs selected primarily support Cleaner Production (CP), Energy Efficiency (EE), Renewable Energy (RE) or other activities (which could include CP and/or EE). Types of mechanisms included Awards (A), Carbon Credits (CC), Grants (G), Lines of Credit (LC) and Technical Assistance (TA).

Donors: Nine of the surveyed programs provided the size of their funds: approximately US\$100M was available. One program had a variable level of funding that depends on the donors involved each year, while nine programs either did not provide this information or do not have a limit of funds (mainly the case for lines of credit). Foreign governments or international agencies provided 99.88% of the US\$100M. However, national donors funded six programs, five of which are lines of credit from private banks that did not disclose the amount of funding they have available (Banco Popular and Bancredito SMEs Center in Costa Rica and Grupo Financiero de Occidente in Guatemala). The National EE Award in El Salvador is also funded by local sources. Several international financial institutions either directly sponsor programs, or indirectly through local institutions. For example, the German kfW Development Bank initiated the “MiPyME verde” program in 2010 with the Central American Bank for Economic Integration (BCIE) to provide financing instruments for environmental investments focused on “more efficient use of natural resources” and reducing pollution. The program began in El Salvador with an environmental credit line that had a total budget of \$US10 million. SMEs making investments in “cleaner production, reduced usage of primary resources, emission reductions, environmental compliance, energy efficiency or renewable energy” could apply for funding for up to 80% of the investment, up to \$US500,000, and were given a payback period of 1-15 years, with a fixed interest rate of 7.36%. The program was later expanded to the entire region.

Beneficiaries and range of funds: Many programs do not directly award SMEs through the incentives being promoted. In three of the programs, the funds are not directly provided to the SMEs, but instead could be shared by other indirect stakeholders. Nine of the programs require a third party to disburse/administer the funds, acting like an auditor or consultant to ensure the correct use of funds.

The range of funds available to beneficiaries depends on the activities supported by the respective programs:

- Awareness activities like workshops, communication programs and dissemination require less than US\$10,000 for companies and less than US\$100,000 for institutions.
- Pre-feasibility studies to determine technical opportunities and eligibility for the programs receive US\$1000 to US\$5000.
- The cost of performing a CP/EE/RE technical diagnostic evaluation of opportunities at the company in those areas: US\$50,000-US\$80,000. This amount is typically paid to consultants to perform the technical diagnostic, not directly to the companies.
- Disbursements for implementation of projects and technology changes can range from \$50,000 to \$600,000 but in most cases is less than US\$100,000.
- Disbursements for technology changes can exceed US\$1,000,000. In such cases, the recipients are more likely to be larger companies, as the scale of economic activities of MSMEs is far smaller than would require a million dollar investment for technology change.

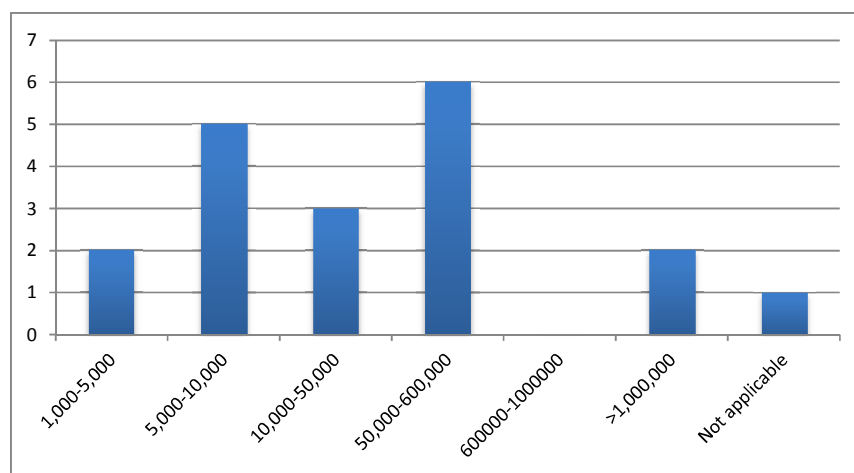


Figure 1: Range of funds available to recipients through surveyed programs

Outreach: Of the nineteen programs, about half (8) rely on training workshops or seminars to increase awareness of their programs and encourage companies to participate in the initiatives, some of these also hosted special events to publicize their programs and utilized traditional and online media. A few programs (4) relied on neither training nor media, but instead reached out to companies directly.

Application procedures: The requirements to apply for the programs typically involve compliance with at least three established criteria. Twelve of the programs require a preliminary registration in a website or list even before companies can submit their information to validate eligibility criteria, which is common in grant and award programs. Most of the application requirements relate to identification of economic risk, size of funds, and potential environmental benefits. In nine of the programs an environmental and economic audit is performed to ensure that the company complies with the program requirements and four programs require an external project manager or intermediary financial institution to provide the funds.

Only five of the programs require demonstration of environmental benefits. If environmental benefits are not explicitly required, this should be perceived as an incentive to SMEs, as companies need only to demonstrate the financial aspects. SMEs may also benefit from a lighter reporting during the monitoring/auditing process. The credit lines appear to be the most rigorous instruments, all of them require an economic and environmental audit and/or goals of environmental benefits in addition to the financial requirements. In this regard, grants by international cooperation can be seen as less strict than typical local instruments like credit lines, at least during the application process. Although some

programs include environmental aspects in the analysis like resources consumption, emissions generation or reductions, in most of cases these criteria are used to ensure that the size of the company is big enough to ensure minimum economic benefits. In various programs these criteria could lead to disqualifying micro enterprises and even small companies that have cottage or artisanal scale production.

Monitoring: Eleven of the programs include monitoring activities or systems. Nine monitor GHG emissions, which can be expected since these programs are directly related to energy or include energy measures while others monitor for financial indicators and resource use/reduction and cost of resources. However, these are also related to energy (electricity) or fuels and not to all resources (water, chemicals, etc.), confirming that programs have a strong focus on energy and not cleaner production more broadly. Notably, the award programs do not monitor activities after the prize is awarded.

4.2 Program activities in 2010-2014

Statistics about the applications, the type of projects approved and the size and sector of companies were requested for the last five years to all programs to perform a statistical analysis. However, in most of cases the information was limited to the last two years, and limited to general data. We attempted to analyze the applications and awards across the fifteen programs, however, the paucity and diversity of data, limited comparisons.

Thirteen programs provided some statistical information about applications received and approved in 2010-2014, but only two provided data for more than 2 years. Most of the applications data (68% of applications) were from the Green PYME program that is active across all countries. From 1575 applications, 1178 included cleaner production projects or measures. Only 1175 applications were approved and 730 said they included cleaner production measures. Most of the approved applications (69%) were related to energy efficiency, with 12% related to other aspects of CP, 5% related to renewable energy and 14% related to other activities (see Figure 2).

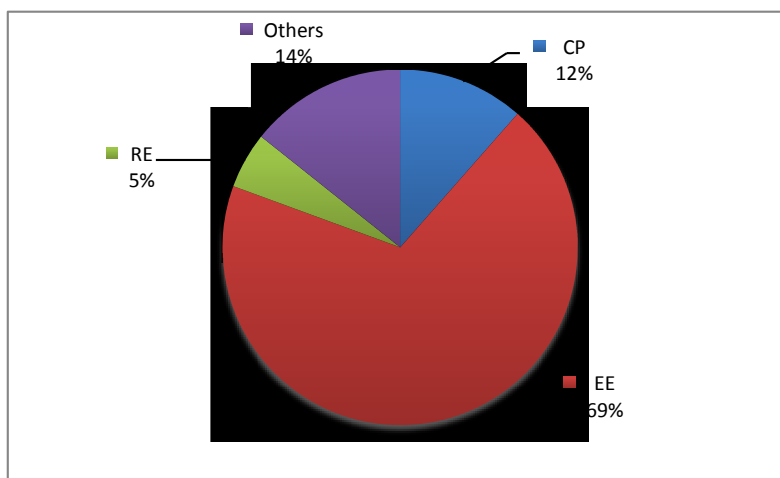


Figure 2: Approved applications across thirteen programs by type of project

4.3 Successes, barriers, and outlook

For the majority of programs, success is recorded in terms of the growth in the number of projects awarded and the amount of funding disbursed, as well as the economic and environmental benefits realized by the recipient enterprises. Among the benefits, cost savings were most frequently reported, as was increasing environmental awareness among participating companies. About half of the

respondents felt that their programs had successfully generated broader impacts with the growth of other market-based mechanisms in their respective countries.

Half of the respondents indicated that the biggest barrier for companies to participate in their programs was a lack of awareness of the existence of the programs. Eight respondents thought that the companies' lack of capital, lack of credit history, poor creditworthiness or inability to make convincing business cases were a critical barrier. Six suggested that the firms lacked the human resources to develop effective proposals from both technical and financial perspectives, and four indicated that the mindset of company owners and their unwillingness to make changes created a cultural barrier.

Conversely, from a programmatic perspective, the majority (twelve) of respondents felt that raising awareness amongst the target population was their most significant challenge for expansion of their programs. About one-quarter suggested that a major concern for them was securing and maintaining financing and other resources to sustain the program activities. A couple indicated that most banking institutions remain uninterested in financing sustainability related activities, and that bank staff require training to be able to analyze the non-financial aspects of loan or grant proposals from companies.

Respondents were asked to identify strategies for strengthening their programs. More than one-quarter believed that training on CP/EE topics for a wide variety of professionals – entrepreneurs, consultants, project developers, and technology suppliers would be critical to increase the demand for market-based products. An equal number suggested that stronger environmental regulation and enforcement would motivate companies to participate in their programs. Several respondents cited the need for additional resources, adjusting program structures and collaboration with others in this space as important factors for future success.

5. Discussion and Conclusions

In most of Latin America, particularly the larger countries such as Mexico, Brazil, Argentina and Chile, lending programs are the most common type of market incentive available to companies (OECD 2012). Grants and awards appear to be the most common types of incentives provided for cleaner production and energy efficiency in Central America, except in the case of Costa Rica and Guatemala where local banks have created lines of credit for green projects. While credit lines are funded by domestic sources, the grants are funded by foreign donors, particularly European governments. A larger pool of funds and less stringent eligibility criteria suggest that MSMEs are more likely to utilize grants rather than domestic loan programs. National awards, which provide recognition or cash prizes after a company invests in CP/EE limit the number of companies that are capable of making the investments without external assistance in the first place.

Although most of the programs can fund cleaner production measures, most do not explicitly focus on CP. It would appear that interest in funding energy efficiency has outpaced cleaner production in Central America. For example, El Salvador's available programs almost exclusively focus on energy efficiency; it is also notable that a National CP Award program ceased in 2009 and a National EE Award was introduced in 2013. The potential for implementing CP may be reduced because of the limited scope of different programs. For example, if the company applies to an energy efficiency program, measures related to other environmental aspects such as water or solid waste could not be funded; such aspects could be justified if they can also result in energy efficiency improvements. Another point to consider is that the recommendations that could be funded by the program may not necessarily be the most important or the priority of the company.

We primarily looked at the supply side of market-based incentives, but there is a lot of evidence that small companies are not demanding these services, and do not want external financing for their projects because of the perceived requirements and risks they think they would face. Program managers identified the greatest obstacle to greater adoption of their programs as lack of awareness among the MSME owners/managers, which has been described elsewhere. They suggest that training

for a variety of stakeholders, from the small business owners to consultants and even staff at lending institutions, should be the top priority for increasing demand for market-based instruments in the region. Most programs have a several requirements to determine companies' eligibility to participate, monitoring indicators that are not necessarily consistent with the eligibility requirements, and in some instances no follow-up to track actual impact of the incentives on economic and environmental performance. These requirements inhibit companies' willingness to participate as they risk wasting their limited time and resources if they are not successful. One program in Costa Rica Bancredito's "Grow SMEs" emphasized reducing the documentation required for companies to apply to access a line of credit at their bank. In addition to further studies of these supply side constraints, future research should combine looking at the demand side constraints in order to better design programs to meet the financing needs of MSMEs to implement resource efficient practices.

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