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Analysis of renewable energy incentives in the Latin America and Caribbean region: The feed-in tariff case

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HIGHLIGHTS

- 12 LAC countries have implemented formal targets for renewable energy deployment.
- Argentina, Dominican Republic, Ecuador, Honduras, and Nicaragua, are using feed-in tariffs (FITs) to promote renewables.
- Low-risk FIT design of feed-in tariffs in the LAC region can be improved.

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ABSTRACT

Renewable energy is becoming a priority for Latin America and Caribbean (LAC) countries because of energy challenges such as demand growth, high dependence on imported fossil fuels, and climate change. As of 2010, 12 LAC countries have implemented formal targets for renewable energy deployment. Some of the LAC countries, namely Argentina, Dominican Republic, Ecuador, Honduras, and Nicaragua, are using feed-in tariffs (FITs) to promote renewables. FITs are long-term, guaranteed purchase agreements for green electricity at a price that can provide project developers a reasonable return on investment. FITs are increasingly popular because if designed well, they can mitigate investor risk in renewables. This article presents a low-risk FIT design and then uses this design to benchmark the existing LAC region FITs.

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1. Introduction

The Latin America and Caribbean (LAC) region faces a series of interrelated energy challenges. First, the region will require a significant amount of new electricity generation in order to meet demand growth and replace aging infrastructure. Between 2009 and 2015, the region is projected to need to install 60 gigawatts (GW) of new capacity (Byer et al., 2009). Second, many countries in the LAC region do not have well diversified energy portfolios and are exposed to fossil fuel price volatility, which in turn could heavily affect national budgets trough existing pass-through provisions in electricity supply contracts, and/or climate variability, including droughts, which effects those with heavy hydropower reliance. The Caribbean, for example, has seen significant electricity price increases because 85% of its electric power is generated with oil (KEMA, 2008). LAC countries will need to integrate a broader range of energy technologies into their portfolios in order to improve energy security and mitigate the impact of fossil fuel price spikes and other external shocks. Third, the region is vulnerable to the adverse impacts of climate change and as a result, countries are actively pursuing mitigation and adaptation strategies. LAC countries will need to integrate low-carbon generation into their energy systems in order to reduce carbon emissions and to take advantage of the significant financial resources that could be made available through the international climate negotiations (ECLAC and IDB, 2010).

These energy challenges, among other drivers, have led to an increased interest in developing renewable energy (RE) in LAC countries. In 2002, countries in the area committed to meeting 10% of regional total energy from renewable resources by 2010 as part of the Latin American and Caribbean Initiative or Sustainable Development. Although this goal has been achieved and surpassed on a regional basis (UNEP, 2008), numerous countries have also established

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Table 1
LAC renewable energy targets.

LAC countries	Renewable energy target
Argentina	8% of electricity demand by 2016
Brazil	~13% of installed electricity capacity to come from NCRE by 2019
Chile	10% of electricity supply to come from NCRE by 2024
Colombia	3.5% participation of NCRE by 2014 in the national interconnected system (6.5% by 2020)
Costa Rica	100% of electricity by 2021 (including large hydro)
Ecuador	(i) 80% of electricity from hydro (approx 40–50% currently) (ii) 10% from non-large-hydro renewables by 2020
Jamaica	30% of energy by 2030
Mexico	7.6% of installed electricity capacity by 2012
Peru	(i) 5% of electricity by 2013 (excluding large hydro) (ii) a new objective is to be set every 5 years
St. Lucia	5% of electricity by 2013, 15% by 2015 and 30% by 2020
St. Vincent and Grenadines	30% electricity by 2015 and 60% by 2020
Uruguay	(i) 50% of primary energy, including large hydro (ii) 15% of electricity from NCRE by 2015

Source: Argentina: Boletín Oficial de la Republica Argentina (2006); Brazil: MME and EPE (2010); Chile: CNE and GTZ (2009); Colombia: MME, República de Colombia (2010); Costa Rica: MINAET (2010); Ecuador: MEER (2010); Jamaica: MEM—Ministry of Energy and Mining (2010); Mexico: SENER (2009); Peru: Congreso de la República de Perú (2008); St. Lucia: Ministry of Physical Development and the Environment (2010); St. Vincent and Grenadines: Cabinet of St. Vincent and Grenadines (2010); Uruguay: MIEM (2008).

their own formal renewable energy targets by legislation or decree (Table 1).[1] A few LAC countries (Brazil, Ecuador, Peru and Uruguay) specifically distinguish between renewable energy targets for conventional sources and non-conventional renewable energy (NCRE).

A key question for policy-makers is how to best meet these targets while also satisfying national policy objectives. There is a wide range of different mechanisms that can be implemented in order to drive renewable energy market growth. Internationally, the most prevalent of these mechanisms is known as a feed-in tariff (FIT). By the end of 2012, this policy tool was implemented in close to 70 countries (REN21, 2012); Sawin and Martinot, 2010. FITs are long-term, guaranteed purchase agreements for green electricity at a price that can provide project developers a reasonable return on investment.

FITs have driven a significant proportion of global renewable energy capacity. By the end of 2010, 64% of the world's wind capacity and 87% of the world's PV capacity was estimated to have been installed under FITs (Rickerson et al., 2012; Mints, 2010). A number of recent reports have also argued that FITs are not only more effective than other policies, but they are also more efficient in their ability to produce renewable electricity at the lowest possible costs (EU Commission, 2008; DBCCA, 2009; Ölz, 2008; Stern, 2006). The effectiveness and efficiency of FITs are attributed to the high degree of investment security that the policies can create. FITs have also been highlighted for their ability to realize the benefits of renewable energy development more rapidly than other policy types (EU Commission, 2008; Ölz, 2008). These benefits, which have been recorded in a range of recent studies include job growth (Deloitte, 2009a, bvan Mark et al., 2010), avoided environmental damage and fossil fuel imports (Van Mark, 2010), and wholesale price suppression from the merit order effect (Ray et al., 2010). The value of the decrease in the wholesale market electricity price through the merit order effect in Germany was estimated to be up to €4 billion, compared to an incremental FIT policy cost of €4.7 billion in 2009.

Despite favorable geographic and economic conditions for renewable energy promotion in the Caribbean and Latin America, FITs have spread slowly in the region when compared to Europe. Brazil was the first country to implement this policy in 2002 (though it ended in 2010), followed by Ecuador (2002), Nicaragua (2005), Argentina (2006), Honduras and the Dominican Republic (2007) and Peru (2010) (see Fig. 1 below). There have not been many efforts to date to characterize and compare the design of FIT policies in the LAC region. This article provides an overview of FIT policies in the LAC region and compares them. This article provide a snapshot of the FIT policy structures as they existed at the end of 2010. More recent updates and policy changes will be examined as part of future research.

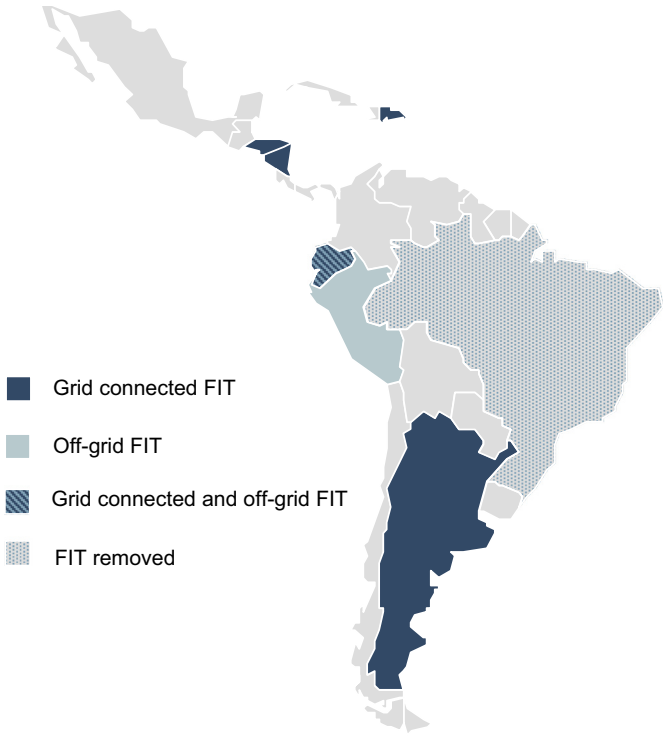

Fig. 1. FIT policies in the LAC region.

2. Methodology: Defining low-risk FIT designs

This section presents a framework for defining and analyzing FITs from an investor perspective. This framework was developed

[1] This list includes only countries that have established formal targets through legislation or regulation, and does not include draft targets or goals that have been announced, but are not formally a part of official policy. Each of the targets in Table 1 excludes large hydropower unless otherwise noted.

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