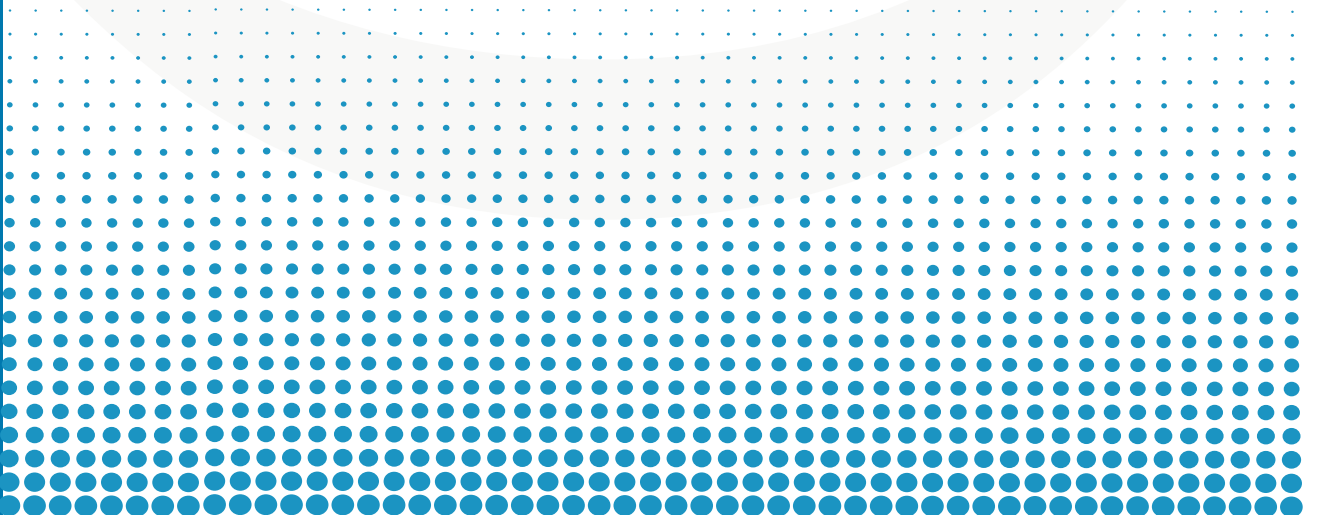


Renewable Energy in Latin America 2015: An Overview of Policies

JUNE 2015



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List of Acronyms

ARECA	Project Accelerating Renewable Energy in Central America and Panama
ARS	Argentinian Peso
BHU	Banco Hipotecario del Uruguay (Public Mortgage Bank of Uruguay)
BNDES	Banco Nacional de Desenvolvimento Econômico e Social (Brazil National Development Bank)
CARICOM	Caribbean Community
CCS	Carbon Capture and Storage
CDC	Crédito Direto ao Consumidor (Direct Consumer Credit in Brazil)
CDE	Conta de Desenvolvimento Energético (Brazilian Energy Development Fund)
CDM	Clean Development Mechanism
CFE	Comisión Federal de Electricidad (Federal Electricity Commission, Mexican electric utility)
CO ₂	Carbon Dioxide
FAZNI	Fondo de Apoyo Financiero para la Energización de las Zonas No Interconectadas (Fund for the Financial Support of Energy Access in Isolated Areas of Colombia)
FEISEH	Fondo Ecuatoriano de Inversión en los Sectores Eléctrico e Hidrocarburífero (Equatorian Fund for the Investment in the Electric and Hydrocarbons sectors)
FENOGE	Fondo de Energías No Convencionales y Gestión Eficiente de la Energía (Fund for Non-Conventional Energy Sources and Efficient Energy Management of Colombia)
FERUM	Programa de Energización Rural y Electrificación Urbano-Marginal (Urban Marginal Electrification and Rural Energy Access Programme of Ecuador)
FINET	Fondo de Inversión Nacional en Electricidad y Telefonía (National Investment Fund in Electricity and Telephony of El Salvador)
FODIEN	Fondo para el Desarrollo de la Industria Eléctrica Nacional (National Electric Industry Development Fund of Nicaragua)
FONER	Fondo Nacional de Electrificación Rural (National Fund for Rural Electrification of Peru)
GDP	Gross Domestic Product
GEF	Global Environment Facility
GRIF	Guyana REDD+ Investment Fund
GW	Gigawatt
IRENA	International Renewable Energy Agency
kW	kilowatt
LPG	Liquefied Petroleum Gas
MW	Megawatt
MWav	Megawatt Average (Brazilian energy unit)
MWh	Megawatt-hour
NFFO	Non-Fossil Fuel Obligation (United Kingdom)
PAB	Panamanian Balboa
PPA	Power Purchase Agreement

PROALCOOL	Programa Nacional do Alcool (National Alcohol Program in Brazil)
PROEOLICA	Wind Energy Emergency Program in Brazil (i.e. 2001 wind feed-in tariff)
PROESCO	Apoio a projetos de eficiência energética (Support for energy efficiency projects, by BNDES Brazil)
PROINFA	Programa de Incentivo às Fontes Alternativas de Energia Elétrica (Programme of Incentives for Alternative Electricity Sources in Brazil, i.e. 2002 feed-in tariff)
PRORENOVA	Support for renewal/expansion of sugarcane fields in Brazil, by BNDES
PV	Photovoltaic
REDD+	Reducing Emissions from Deforestation and Forest Degradation
RGR	Global Reversion Reserve of Brazil
UNDP	United Nations Development Programme
USD	United States Dollar
VAT	Value Added Tax

About this report

This report provides an overview of renewable energy policy in the Latin American region. It is a synthesis of 20 IRENA *Renewable Energy Policy Briefs*, which describe in detail the policy support for renewables in each Latin American country (*) and provide detailed references and hyperlinks to the original official documents.

The information cited in this report has been obtained from over 325 primary sources including legislation from the respective countries and official government

sources such as plans, reports and press releases. This has been complemented with input from country policy makers and experts. Specific projects or programmes are beyond the scope of this analysis.

This report analyses policies in four sectors: electricity, heat, transport and energy access, as well as some cross-cutting and other enabling policies, and is organised accordingly.



() For the purposes of this report, this comprises: Argentina, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Guyana, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Uruguay and Venezuela*

The designations employed and the presentation of material in this map do not imply the expression of any opinion on the part of IRENA concerning the legal status of any region, country, territory, or area, or concerning the delimitation of frontiers or boundaries

1. Introduction

Interest in renewable energy sources in Latin America, along with policies to promote them, goes as far back as the 1970s and the oil shocks, with the establishment of the ProAlcool biofuels programme in Brazil in 1975 and geothermal laws in Costa Rica in 1976 and Nicaragua in 1977.

Today Latin America is a region of rapid growth for renewable energy, with an even faster growing interest in developing those resources. High electricity prices across most of the region, growing demand, energy security concerns and, in some cases, the potential for export, provide a fertile ground for the deployment of renewable energy technologies, made even more attractive by the recent decreases in some technology costs and increased competitiveness. The region has, in addition, a long history of hydropower development.¹ All this has translated into numerous policies and legislation to support renewable energy, which are the object of this report.

This report analyses over 325 renewable energy support schemes in Latin America, summarised in Table 1. Nearly all Latin American countries have established renewable energy targets and most have enacted renewable energy laws. In the electricity sector, the prevalent policy mechanisms for the promotion of renewable energy are auctions and fiscal incentives. For the transport sector, renewable energy policies in Latin America focus on biofuels, with blending mandates and fiscal incentives as the most used mechanisms. The use of renewable energy for heating, both at the residential and commercial levels, has seen limited regulatory development in the region. Innovative policy designs have been identified in Latin America, particularly those hybridising auctions with other regulatory mechanisms.

National **renewable energy targets** provide a trajectory for the future evolution of the energy mix and indicate the level of renewable energy development and the timeline envisioned by governments. As such, they play a significant role in informing investment

decisions. In Latin America, 19 of 20 countries have set at least one type of renewable energy target at the national level (see Table 2).

The enactment of national **renewable energy policies** provides a tangible framework and enabling conditions for the development of renewable energy sources. Ten countries have national renewable energy laws or strategies, with an additional seven having technology-specific laws (e.g. geothermal). Only three countries in the region have no renewable energy policy or strategy in place.

Access to **finance** is crucial for the development of renewable energy resources, particularly considering the higher upfront cost of some renewable energy technologies when compared to their conventional alternatives. At least 14 countries have established public funds or facilities that can finance eligible renewable energy projects in the electricity, transport, heat and energy access sectors (see Table 4).

In the **electricity** sector, **auctions** and **fiscal incentives** are the most widespread support mechanisms. The use of auctions for renewable energy has been adopted in 13 of the 20 Latin American countries (see Table 3). A trend towards more technology-specific auctions seems to be strengthening, with over 20 auctions during the 2013-15 period being eligible for one or two renewable energy technologies. At least 18 countries have fiscal incentives for renewable energy in the electricity, transport, heat and energy access sectors (see Table 1). Other policies that are gaining popularity include **net metering**, used in 10 countries, and preferential **grid access** provisions, found in 13 countries.

In the **transport sector**, the dominating support policy scheme is biofuel **blending mandates**, present in 10 countries (see Table 6), as well as **fiscal incentives**, found in 8 countries.

In contrast, policy support for the use of renewable

¹As a mature technology and because of its scale, hydropower is often considered differently than the other renewable energy sources. Hydropower policies are discussed later in the text and in Table 5.

energy sources for **heating** purposes, both residential and commercial/industrial, is limited. Only a handful of countries have some type of policy in place, mostly related to solar water heating and improved cookstoves.

The inclusion of renewable energy technologies in policies, programmes and projects for **energy access** is widespread, and has been identified in 18 countries.

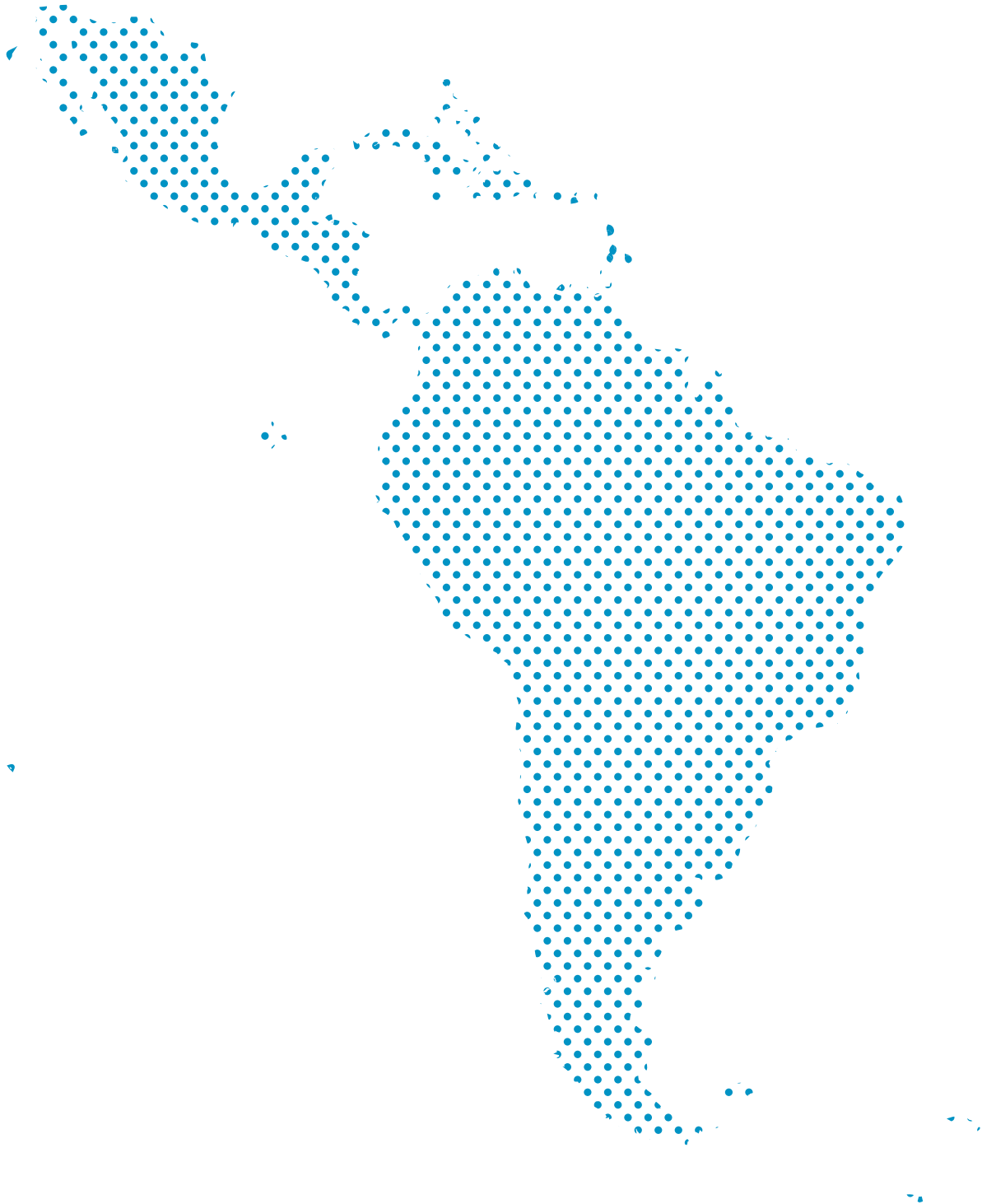


TABLE 1: Renewable energy policies in Latin America

	National Policy								Fiscal Incentives							Grid Access					
	Renewable Energy Target	Renewable Energy Law / Strategy	Solar Heating Law / Programme	Solar Power Law / Programme	Wind Power Law / Programme	Geothermal Law / Programme	Biomass Law / Programme	Biofuels Law / Programme	VAT Exemption	Fuel Tax Exemption	Income Tax Exemption	Import / Export Fiscal Benefit	National Exemption of Local Taxes	Carbon Tax	Accelerated Depreciation	Other Fiscal Benefits	Transmission Discount / Exemption	Priority / Dedicated Transmission	Grid Access	Preferential Dispatch	Other Grid Benefits
Argentina	■	■			■										■						
Belize	■	■																			
Bolivia	■							■				■	■								
Brazil	■				■					■		■				■	■				
Chile	■	■	■	■		■	■		■				■			■		■			
Colombia	■	■							■						■						■
Costa Rica	■					■	■									■					
Ecuador	■					■	■											■	■		
El Salvador	■			■															■	■	
Guatemala	■						■		■							■		■			
Guyana	■								■												
Honduras	■	■									■	■				■		○	■		
Mexico	■		■			■	■								■		■				■
Nicaragua	■	■				■	■		■							■					■
Panama	■	■	■	■	■		■			■		■			■		■				■
Paraguay									■										■		
Peru	■	■		■		■	■		■						■	■		■	■	■	■
Suriname	■																				
Uruguay	■	■	■				■			■						■	■				■
Venezuela	■	○							■	■						■					
TOTAL (Active)	19	11	4	4	2	6	8	11	9	6	10	12	5	2	5	12	7	3	8	5	6

■ Active; ■ Expired, superseded or inactive; ■ Subnational level; ○ Under development

For details on specific country policies, please refer to the relevant IRENA *Renewable Energy Policy Brief* (IRENA, 2015a).

TABLE 1 (contd.): Renewable energy policies in Latin America

Regulatory Instruments													Finance					Other							
Auctions	Feed-in Tariff	Premium	Quota	Certificate System	Hybrid	Net Metering	Ethanol Blending Mandate	Biodiesel Blending Mandate	Solar Mandate	Registry	Currency Hedging	Dedicated Fund	Eligible Fund	Guarantees	Pre-investment Support	Direct Funding	Renewable Energy in Social Housing	Renewable Energy in Rural Access Programmes	Renewable Energy Cookstove Programme	Local Content Requirements	Special Environmental Regulations	Food / Bioenergy Nexus	Social Requirements		
												•				•									Argentina
																									Belize
	○																								Bolivia
									•																Brazil
																									Chile
																					○				Colombia
																									Costa Rica
							•																		Ecuador
																									El Salvador
																									Guatemala
																									Guyana
																									Honduras
							•		•																Mexico
																									Nicaragua
																									Panama
																									Paraguay
																									Peru
																									Suriname
																	○								Uruguay
																									Venezuela
12	4	3	4	2	4	10	7	6	4	4	10	9	9	6	11	11	5	18	4	5	5	4	5		TOTAL (Active)

2. Electricity

Electricity generation is the sector that has attracted most of the renewable energy policy and legislative developments in Latin America (as in many other regions). These include the enactment of renewable energy laws, the establishment of renewable electricity targets, regulatory instruments such as auctions, feed-in tariffs, quantity-based mechanisms and net metering, fiscal incentives, grid access provisions and finance facilities.

The existence of **renewable energy laws** providing a legal framework for the promotion of renewable energy generally offers an indication of the country's support for renewables. Currently Argentina, Belize, Chile, Colombia, Honduras, Mexico, Nicaragua, Panama, Peru and Uruguay have renewable energy² laws, and Venezuela is developing one. It must be noted, however, that the lack of such specific legislation does not necessarily mean the absence of a robust support for renewables, as Brazil and Costa Rica clearly exemplify. Most Latin American countries have one or more renewable **resource-specific laws** (e.g. geothermal law or biomass law), including Brazil, Costa Rica, Ecuador, El Salvador, Guatemala and Paraguay.

Bolivia, Guyana and Suriname are currently the only countries without laws or programmes for renewable energy, although Bolivia is developing one. Even with the absence of specific laws promoting renewable energy, supporting measures for renewable energy may be built into general laws, such as the electricity law (as in Costa Rica) or the tax code, or at lower regulatory levels as norms, etc.

The setting of **national renewable energy targets** provides a clear indication regarding the level of renewable energy development and the timeline envisioned by governments. Targets have been identified in 19 Latin American countries as summarised in Table 2, with the majority relating to the electricity sector. Targets can be stated in capacity (MW) or generation (MWh) terms, or in relative, incremental or absolute terms. Different types of targets (e.g. scope, technology or timeline) often coexist and overlap. For example, Ecuador has a target of 90% renewable electricity by 2017, and a

target of 4.2 GW of hydropower by 2022. Guatemala has set a long-term target of reaching 80% of electricity generation from renewable energy sources, installing 500 MW of renewable capacity and building 1,500 km of transmission lines to integrate renewable energy, with the interim target of reaching at least 60% of electricity generation from renewable energy sources by 2022.

TARGETS

Renewable energy targets are numerical goals established by governments to achieve a specific amount of renewable energy production or consumption. Renewable energy targets can apply to the electricity, heating/cooling or transport sectors, or to the energy sector as a whole, and often include a specific time period or date by which the target is to be reached.³

Auctions are the most popular regulatory instrument for the deployment of renewable energy in Latin America. Thirteen out of the 20 countries analysed have experience with renewable energy auctions, namely Argentina, Belize, Brazil, Chile, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Peru and Uruguay. Table 3 identifies 54 auctions in Latin America that were either renewable energy-specific or in which one or more renewable energy technologies were eligible, providing information on the auction year, eligible technologies, amounts auctioned/awarded, and references to the original documents.

AUCTIONS

Auctions refer to competitive bidding procurement processes for electricity from renewable energy or where renewable energy technologies are eligible. The auctioned product can be either capacity (MW) or energy (MWh). Project developers who participate in the auction submit a bid with a price per unit of electricity at which they are able to realise the project. The government evaluates the offers on the basis of the price and other criteria and signs a contract with the successful bidder, usually a long-term power purchase agreement (PPA).⁴

² Or "clean" or "sustainable" energy with renewables explicitly considered.

³ For an in-depth analysis of renewable energy target setting see IRENA (2015b).

⁴ For an in-depth analysis of renewable energy auctions see IRENA (2015c).

TABLE 2: Renewable energy targets in Latin America

	Renewable Energy Target
Argentina	<ul style="list-style-type: none"> 8% electricity generation by 2016
Belize	<ul style="list-style-type: none"> 50% electricity generation 15 MW additional hydro by 2033 5 MW solid waste generation
Bolivia	<ul style="list-style-type: none"> 183 MW of renewable capacity by 2025 Increase renewable energy in the mix by 10% in 5 years 120 MW geothermal
Brazil	<ul style="list-style-type: none"> 42.5% primary energy supply by 2023 86.1% of electricity generation matrix by 2023
Chile	<ul style="list-style-type: none"> 20% electricity generation by 2025 45% of new capacity until 2025
Colombia	<ul style="list-style-type: none"> 6.5% electricity by 2020, excluding large hydro
Costa Rica	<ul style="list-style-type: none"> 28.2% primary energy by 2020s 97% electricity by 2018
Ecuador	<ul style="list-style-type: none"> 90% electricity by 2017 4.2 GW hydropower by 2022 277 MW other than hydro by 2022
El Salvador	<ul style="list-style-type: none"> By 2026: wind 60 MW, solar PV 90 MW, solar thermal 200 MW, geothermal 60-89 MW, small hydro (<20 MW) 162.7 MW, biomass 45 MW, and biogas 35 MW
Guatemala	<ul style="list-style-type: none"> 60% electricity by 2022 80% electricity long-term 500 MW long-term
Guyana	<ul style="list-style-type: none"> CARICOM target: 20%, 28% and 47% renewable electricity for years 2017, 2022 and 2027 respectively
Honduras	<ul style="list-style-type: none"> 60% electricity by 2022 80% electricity by 2034 25% more hydropower by 2034
Mexico	<ul style="list-style-type: none"> Clean energy¹: 24.9% by 2018, 35% by 2024, 40% by 2035 and 50% by 2050 By 2018: 13,030 MW hydropower, 8,922 MW wind, 1,018 MW geothermal, 748 MW bioenergy, and 627 MW solar
Nicaragua	<ul style="list-style-type: none"> 94% electricity by 2017
Panama	<ul style="list-style-type: none"> 706 MW hydropower by 2023
Peru	<ul style="list-style-type: none"> 6% electricity generation by 2018 (excluding hydro) 60% electricity generation by 2018 (including hydro)
Suriname	<ul style="list-style-type: none"> CARICOM target: 20%, 28% and 47% renewable electricity for years 2017, 2022 and 2027 respectively
Uruguay	<ul style="list-style-type: none"> 50% primary energy by 2015 90% electricity by 2015
Venezuela	<ul style="list-style-type: none"> 613 MW additional renewable electricity capacity by 2019, of which 500 MW is wind power

¹"Clean energy" includes renewables, cogeneration, nuclear energy, fossil fuels with CCS, and "other low-carbon technologies".

TABLE 3: Renewable energy auctions in Latin America

Country	Year	Wind (MW)	Solar (MW)	Biomass (MW)	Hydro (MW)	Reference
Argentina	2009	(500)	(20)	(390)	(60)	<i>GENREN</i>
Belize	2014	(15)				<i>RFPEG Belize 2013</i>
Brazil	2015 [*]					<i>Rule MME 070/2015</i>
Brazil	2015 [*]					<i>Rule MME 069/2015</i>
Brazil	2015 [*]					<i>Rule MME 672/2014</i>
Brazil	2015 [*]					<i>Rule MME 653/2014</i>
Brazil	2015 [*]					<i>Rule MME 563/2014</i>
Brazil	2014			0		<i>010/2014</i>
Brazil	2014	769.1	889.6			<i>008/2014</i>
Brazil	2014	926	0	611	43.88	<i>006/2014</i>
Brazil	2014			1 MW _{av} ⁵	1,471 MW _{av}	<i>005/2014</i>
Brazil	2014	551			417	<i>003/2014</i>
Brazil	2013	2,337.8		161.8	1,007.7	<i>010/2013</i>
Brazil	2013	867.6	0	0	0	<i>009/2013</i>
Brazil	2013			647	618.5	<i>006/2013</i>
Brazil	2013	1,505				<i>005/2013</i>
Brazil	2012	281.9		0	292.4	<i>006/2012</i>
Brazil	2011	976		100	135	<i>007/2011</i>
Brazil	2011	861		357		<i>003/2011</i>
Brazil	2011	1,067.6		197.8	450	<i>002/2011</i>
Brazil	2010	2,047.8		712.9	131.5	<i>007/2010</i>
Brazil	2010					<i>005/2010</i>
Brazil	2010				2120	<i>004/2010</i>
Brazil	2010				808.9	<i>003/2010</i>
Brazil	2009	1,805.7				<i>003/2009</i>
Brazil	2008			2,379.4		<i>001/2008</i>
Brazil	2007	0		541.9	96.7	<i>003/2007</i>
El Salvador	2014	0	0	0	0	<i>CAESS-CLP-001-2014</i>
El Salvador	2014	0 (40)	94.4 (60)			<i>DELSUR-CLP-RNV-001-2013</i>
El Salvador	2013		(7)	(4)	(4)	<i>CAESS-CLP-RNV-001-2013</i>
Guatemala	2015 [*]					<i>CNEE-055-2015</i>
Guatemala	2014		18			<i>GD-1</i>
Guatemala	2013			1,920 GWh/yr	152	<i>PEG-3</i>
Guatemala	2012		420			<i>PEG-2</i>
Guatemala	2011				196	<i>PEG-1</i>
Honduras	2010					<i>100-1293/2009</i>
Panama	2014					<i>LPI-ETESA 03-14</i>
Panama	2014					<i>LPI-ETESA-01-14</i>
Panama	2013					<i>LPI-ETESA 03-13</i>
Panama	2013					<i>LPI-ETESA-02-13</i>
Panama	2013					<i>LPI-ETESA-07-12</i>
Panama	2012					<i>LPI-ETESA 04-12</i>
Panama	2012					<i>LPI-ETESA-01-12</i>
Panama	2011					<i>LPI-ETESA-05-11</i>

TABLE 3 (contd.): Renewable energy auctions in Latin America

Country	Year	Wind (MW)	Solar (MW)	Biomass (MW)	Hydro (MW)	Reference
Peru	2015*	(1,300 GWh)			(450 GWh/yr)	4th RE auction
Peru	2014					1st off-grid RE auction
Peru	2013				1,278 GWh/yr	3rd RE auction
Peru	2011	416 GWh/yr	43 GWh/yr	14 GWh/yr	680 GWh/yr	2nd RE auction
Peru	2010		0	11.7 GWh/yr	92 GWh/yr	1st Auction, 2nd call
Peru	2009	571 GWh/yr	173 GWh/yr	143 GWh/yr	161	1st Auction, 1st Call
Uruguay	2013		(207)			Decree 133/013
Uruguay	2011	(150)				Decree 159/011
Uruguay	2009	(150)				Decree 403/009
Uruguay	2006	(20)		(20)	(20)	Decree 77

■ Technology eligible; * Planned; Number indicates amount contracted if known, number in brackets () indicates amount auctioned; all figures in MW unless otherwise noted.

Renewable energy auctions in Latin America usually offer a long-term power purchase agreement (PPA), with durations ranging from 10 to 30 years to successful bidders. The auctions can award contracts for generation capacity (MW), as in Uruguay, for electricity generation (GWh), as in Peru, or a combination, as in Guatemala. Countries such as Brazil define additional units (MW_{av} ⁵) for their auction systems. Auctions can be technology-neutral, that is open to all technologies including renewable and non-renewable, such as for example Belize; renewable-specific, open to all renewables, as in El Salvador; or technology-specific, including combinations of renewables and renewable/non-renewables, as in Brazil. Most countries have a combination of different types of auctions.

Auctions can also be project-specific in some cases where the project serves the strategic objectives of the government and qualified developers bid to develop it. This approach has been used, for instance, for large hydropower projects in Brazil. In some countries, for example Chile and Nicaragua, auctions are used to allocate geothermal concessions.

One of the typical problems with auctions is the risk of underbidding, whereby developers bid too low in order to win the auction and are then unable to deliver the project.⁶ To avoid such problems, most auction schemes currently used in Latin America require **financial guarantees** from the developers. The use of financial guarantees has been identified in Peru, Uruguay, Brazil, Costa Rica, Guatemala, Nicaragua and Panama. The most common types of financial guarantees are *bid bonds*, whereby a bidder commits

to signing the contract if successful in the auction process; *completion bonds*, whereby the developer commits to build the project under the agreed terms of the contract; and *contract bonds*, whereby the owner agrees to maintain a project operational for the duration of the PPA. Typical guarantee magnitudes are about 1% of project costs for bid guarantees, 5% for construction guarantees and 1% for contract guarantees, although these values change case by case. Guarantees also may be specified as percentages of expected revenue, as in Uruguay, or fixed per MW values, as in Guatemala and Peru.

Peru's use of guarantees as an integral part of its auction design is an interesting case. Peru uses stringent guarantees in order to: i) ensure projects come online on time due to the urgency of demand, and ii) to reduce transaction costs for the auctioneer. In addition to strong pre-operational guarantees (e.g. USD 50,000/MW bid bond and USD 250,000/MW construction bond in the 2013 auction), Peru has designed an original approach to contract bonds, whereby any shortcoming in the contracted amount of electricity results in a reduction of the guaranteed tariff by the same percentage for that year.

The use of guarantees is not limited to auctions and has been identified, for example, in the process of geothermal concessions in Nicaragua, in the building of dedicated transmission lines in Mexico and to ensure decommissioning of wind farms at the end of their operation in Uruguay. The financial guarantees required from project developers are not to be confused with credit guarantees, discussed later.

⁵ MW_{av} is the capacity equivalent to 1 MW generating for all hours in a year.

⁶ This problem was particularly acute in early renewable energy auction schemes, such as the 1990s UK Non-Fossil Fuel Obligation (NFFO), impairing their effectiveness.

Feed-in tariffs, possibly the most widespread instrument worldwide in promoting renewable electricity over the last decade, have had limited success in Latin America. Argentina, Brazil and Ecuador each established feed-in tariff schemes, all of which are no longer active. Nicaragua and Uruguay have limited application feed-in tariffs, and Peru uses feed-in tariff design elements in its auctions system. Only Bolivia is in the process of developing a new feed-in tariff system, and Costa Rica is considering one for large-scale solar PV.

FEED-IN TARIFFS

Feed-in tariffs are regulatory instruments that provide guaranteed purchase at a (often above market price) tariff to eligible producers of electricity from renewable energy sources for a defined period of time (e.g. 20 years). Tariff design can account, among others, for technology, capacity installed, electricity prices and overall cost. As such, feed-in tariffs in some countries are designed with degression mechanisms to account for the reduction in generation costs (IRENA, 2014)

In 1998, Argentina established a feed-in tariff for wind and solar power, later expanded in 2006 to cover geothermal, bioenergy, ocean energy and small hydro. Both were unsuccessful in promoting renewable energy deployment, in part due to low tariffs.

In 2001, Brazil established the PROEOLICA feed-in tariff for wind power, followed in 2002 by PROINFA, which provided feed-in tariffs for wind, biomass and small hydropower. PROINFA has been credited with kick starting the wind power sector in Brazil and helped inform subsequent wind power auctions.

Ecuador established its feed-in tariff in 2000, which was in force until the end of 2014. The feed-in tariff was revised several times, adjusting the rates and progressively expanding the number of eligible technologies until 2011 when it covered all renewable energy technologies. Successive revisions reduced the number of eligible technologies and by 2014 it was only available for biomass and small hydro. The feed-in tariff was discontinued by the end of 2014.

In 2010, Uruguay established a limited feed-in tariff for biomass, with a variable rate system according to

availability. Given its mixed results, the scheme is being revised. In 2005, Nicaragua established feed-in tariffs for wind power and run-of-the-river hydropower.

In Latin America, Chile is the only country with a pure renewable energy certificate system, while Mexico has a “clean energy” **certificate system**. Chile’s 5% quota in 2013 will be incrementally expanded each year until it reaches 20% by 2025. In order to ensure the quota is met, Chile has enabled a system of public auctions for renewable energy capacity in those years when it is anticipated that the quota will not be fulfilled. Mexico introduced a quota system in 2014, with the first compliance period in 2018. Mexico’s quota, however, is for “clean energy”, which includes renewables, cogeneration, nuclear energy, fossil fuels with CCS, and “other low-carbon technologies”. Other than in Mexico, where the system is geared toward the possibility of clean energy exports to the United States, where certificate systems predominate, it does not seem that certificates will play a significant role in Latin America’s near future policies for promoting renewable electricity.

CERTIFICATE SYSTEMS

Certificate systems are based on the principle of fixing a quota (absolute or relative) of electricity from renewable energy sources that subject parties (e.g. generators, distributors, consumers) must meet. This is achieved by creating a tradable renewable energy certificate system, where renewable energy producers are awarded certificates according to their production. Producers can then sell those certificates to subject parties who redeem them to meet their quota requirements. The specific design elements are particular to each jurisdiction, including items such as eligible technologies, compliance periods, bankability, etc.

Countries with **net metering** and **self-supply** policies currently in place include Brazil, Chile, Colombia, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Panama and Uruguay. Net metering provisions in Venezuela expired. These include residential and small-scale schemes and, for Mexico and Uruguay, industrial scale as well. Uruguay and Mexico allow off-site self-generation for industrial self-generation, and Colombia is developing commercial-scale regulations. The case of Mexico is unique because self-supply rules were a way to allow private investment

in the sector while complying with a constitutional limitation on the private sale of electricity (recently lifted). By including both the electricity generator and the consumer as partners in the same project, there was no “sale”.

NET METERING AND SELF-SUPPLY

Net metering and Self-supply policies allow consumers to generate their own electricity from renewable energy sources and inject surplus generation into the grid, either to be balanced against future consumption or to be remunerated under contractual terms. Specific design elements include, among others, connection provisions, remuneration terms, banking, balancing periods, off-site generation, transmission costs and losses and fiscal regime

Several **hybrid systems** that combine auctions with design elements from some other regulation, such as feed-in tariffs, quotas or net metering, have been identified. For example, Peru’s auction system combines elements of feed-in tariffs, premiums and quotas. Under Peru’s bi-annual auctions, PPAs at a guaranteed tariff are awarded for between 20-30 years. The guaranteed tariff is met through income from electricity sales in the spot market (and the capacity market if applicable) complemented, as needed, by a variable premium. The amount to be procured in each auction is established through a methodology established to ensure compliance with Peru’s mandatory 5% renewable electricity quota.⁷

El Salvador combined elements of auctions, feed-in tariffs and net metering by reserving 1 MW of capacity in its solar auction. After the auction was resolved, small PV generators could enter a net metering contract with excess generation sold at the price resulting from the auction, until reaching the 1 MW.

Nicaragua combined auctions and quotas by mandating utilities to include a quota of renewable energy in regular power procurement auctions (which include conventional technologies). Uruguay combined auctions and commercial net metering by allowing commercial consumers to install wind farms for self-supply, including off-site, and to sell excess power at the rate resulting from the last auction immediately preceding the contract.

Access to **finance** is key for renewable energy

⁷ Other than hydro

⁸ While some of these funds cover non-electric uses of renewable energy, the complete list of funds has been included in this table because a majority apply to electricity.

⁹ IRENA is currently analysing the impact of renewable energy on selected socio-economic variables, such as jobs, GDP and trade balance. For an update on the status of employment in the renewable energy sector see IRENA (2015e).

development. At least 14 Latin American countries have established public dedicated renewable energy funds or renewable energy-eligible funds. Table 4 summarises the funds identified in this analysis.⁸ It should be noted, however, that the landscape of public finance entities is highly dynamic. While some funds have been in place for decades, many more are created, merged, disbanded, repurposed or otherwise modified every few years. Funds that have lapsed or expired are sometimes reactivated by subsequent legislation.

Each fund has its own funding sources, the most common being government *ad hoc* or regular contributions, specific taxes, fees levies and fines, cross-subsidies, donations from international development partners, legacy assets and sales of public enterprises.

Direct funding, be it in the form of subsidies, grants, direct contract or provision of equity and/or debt, to name a few, can be an effective instrument to promote renewables. Often, direct financial support for renewables is seen as a means to achieve other socio-economic benefits such as energy access, economic development, job creation or poverty reduction.⁹ This analysis has identified direct funding measures for renewable energy in 11 countries, namely Argentina, Brazil, Chile, Ecuador, Guyana, Mexico, Nicaragua, Panama, Peru, Uruguay and Venezuela, although it is likely that direct funding for renewables is present to some extent in most of the other Latin American countries as well.

Under direct contracting, renewable energy projects are awarded contracts, normally PPAs, through direct negotiation. For example, Argentina, Honduras and Nicaragua all have provisions for direct contracting of renewable energy. Limited direct contracting is available in Costa Rica for renewable energy projects under 20 MW and in Panama for hydro projects under 10 MW.

An environmental subsidy is being considered by Uruguay for the construction of an urban waste biomass plant. Pre-investment support, for example, was available in Chile through the *InvestChile* project and its successor the *Support for Non-Conventional Renewable Energy Development Programme*. Direct financial support can be also provided at the sub-national level. For example, in Argentina the Province of Santa Cruz established a subsidy for renewables.

TABLE 4: Public finance for renewable energy in Latin America

Country	Sector	Entity/Fund
Argentina	Electricity	Misiones (subnational) Renewable Energy Fund
	Biofuels	Misiones (subnational) Renewable Energy Fund
Brazil	Electricity	Brazil National Development Bank (BNDES); Energy Development Fund (CDE); Inova Energia
	Biofuels	BNDES; PRORENOVA
	Heat	BNDES; PROESCO
	Energy Access	BNDES; RGR; CDC
Chile	Electricity	Support for Non-Conventional Renewable Energy Development
	Energy Access	Energy Access Fund
Colombia	Electricity	FENOGE
	Biofuels	Fondo Capital Riesgo
	Energy Access	FAZNI
Ecuador	Electricity	FEISEH (expired)
	Energy Access	FERUM
El Salvador	Energy Access	FINET
Guatemala	Energy Access	Rural Electrification Plan Fund
Guyana	Electricity	Guyana REDD+ Investment Fund (GRIF)
	Energy Access	
Honduras	Electricity	Renewable Incentives Law Fund; Hydroelectric Pre-Investment Fund (expired)
Mexico	Electricity	Fund for the Energy Transition and Sustainable Electricity Use; Energy Sustainability Fund; Mexican Petroleum Fund
Nicaragua	Electricity	Energy Investment Development Fund
	Energy Access	Electric Development Fund (FODIEN)
Paraguay	Biofuels	Biodiesel Fund
Peru	Energy Access	Fund for Rural Electrification (FONER)
Uruguay	Heat	Public Mortgage Bank (BHU)

Under **direct public investment** renewable energy projects are directly developed by the government. For example, Venezuela has long-term plans for developing 10 GW of wind power in the Guajira region, with 32 MW already operative. Ecuador plans on investing nearly USD 5 billion in hydropower development from 2013 to 2021.

Fiscal incentives for renewable electricity have been identified in 16 Latin American countries (see Table 1). These include tax exemptions, accelerated depreciation, import and other benefits, such as fiscal stability. Tax exemptions can include income tax, VAT, sales tax, capital tax, resource tax, local taxes, administrative fees, import duties and assorted fees. Exemptions can take the form of reduced or no tax, refunds, deductibles and tax credits, or different payment schedules. Tax

exemptions usually apply to services and equipment and pre-investment expenses related to renewable energy projects, as well as income from sale of electricity and, in some cases, carbon credits and other ancillary income.

Argentina and Peru provide fiscal stability incentives, whereby eligible renewable energy technologies are shielded from potential future changes in their fiscal regime, additional fees, etc. In some cases, new renewable energy-specific taxes are created, such as a geothermal vapour tax and a geothermal surface tax in Nicaragua, and concession fees for hydropower and geothermal in several countries.

Renewable energy **grid access** policies have been identified in 13 Latin American countries, as illustrated in

Table 1. These include mandated grid access, discounts and exemptions from transmission fees, preferential dispatch, priority or dedicated transmission.

Other grid benefits are also provided in some countries. For example, in Colombia renewable energy developers under 20 MW are exempt from a reliability fee to remunerate for reserve power. Panama exempts small renewable energy producers from transmission loss regulations. Peru mandates the consideration of renewable energy resources and zones with high renewable energy potential in transmission plans.

Mexico provides an interesting case for the development of dedicated renewable energy transmission lines from renewable resource-rich areas through a voluntary coordination process between the energy regulator, the public utility CFE and renewable energy developers known as “open season”. The process allowed to estimate a “firm” demand for transmission by renewable energy developers, including the deposit of financial guarantees, which was then used to build the infrastructure and allowed developers to ensure fixed transmission costs.

While **hydropower** is a renewable energy source, it is also a mature low-cost technology that has a long history in Latin America. Hydropower projects may range from a few hundred kilowatts for micro turbines to a few gigawatts for the largest systems. The physical, environmental and social footprint of hydropower projects ranges accordingly, from potentially vast for large reservoir projects to negligible for small run-of-the-river projects. Large hydropower projects generally require long-term planning and integration with development aspects other than just energy (e.g. population displacement, water use, and agriculture).

All these factors have resulted in a variety of legal definitions of hydropower in Latin America, including on whether they are eligible for renewable energy support policies. Many of the countries distinguish between large hydro and small hydro. Table 5 summarises some small hydropower definitions in Latin American countries, although it does not reflect other factors also considered in many cases, such as reservoir area, dam height or water flow.

TABLE 5: Small hydropower definitions in Latin America

Max Capacity	Countries
10 MW	Colombia, Panama
20 MW	Chile, Costa Rica, Peru
30 MW	Argentina ¹ , Brazil,
<i>¹May be different for provincial level projects, e.g. Santa Cruz threshold for small hydropower is 15 MW.</i>	

The jurisdiction over hydropower projects also varies from country to country. For example, in Argentina, projects whose affected basin falls within one province need provincial approval, but those affecting two or more provinces require federal approval. In Peru, projects under 10 MW are approved at the local level. In Costa Rica, projects over 50 MW require approval by the National Assembly. Venezuela’s electric law explicitly reserves the development of the major hydropower basins to the state. Large binational projects such as Itaipu (Brazil-Paraguay) and Yacyretá (Argentina-Paraguay) require international treaties. Other projects under consideration also call for binational legal instruments, such as between Guyana and Brazil for the Mazaruni project.

Special provisions for **small-scale renewable energy** generators are found in several Latin American countries. These typically include exemptions from licensing requirements, reduced or exempt fees and simplified connection procedures. What constitutes “small” changes from country to country and technology to technology.

The inclusion of renewable energy technologies in policies, programmes and projects for **energy access** in Latin America is widespread, and has been identified in 18 countries. Some countries use exclusive concessions as a mechanism to provide energy access through solar home systems. The concessions can be awarded via direct contract, as in Argentina, or through auctions, as in Peru. Direct subsidies for energy access are provided by several countries, including Nicaragua, Bolivia Brazil and Argentina, and at least nine countries have established dedicated renewable energy funds or renewable energy-eligible funds for energy access (see Table 4).

Panama provided that renewable energy power plants with high voltage connections must enable a mid-voltage output for rural electrification purposes.

3. Transport

Policies for the promotion of renewable energy sources in the transport sector in Latin America focus exclusively on the use of biofuels, and are dominated by blending mandates and fiscal incentives.

Biofuel blending mandates are a type of regulation pioneered by Brazil and now widespread. Ten countries in Latin America have blending mandates in their legislation, seven of them active (see Table 6). National mandates can apply to the whole territory, as in Argentina, Brazil and Colombia, be rolled out gradually over different regions, as in Panama, or apply only to certain metropolitan areas, as in Mexico and Ecuador.

Most of the blending mandates have a local content requirement, whereby only locally produced fuel is allowed or counts towards the mandate. Other countries, however, do not have such restrictions or, as in Costa Rica, explicitly allow local and imported biofuels.

Fiscal incentives are an integral part of biofuels support policies in many Latin American countries, including Argentina, Brazil, Chile, Colombia, Honduras, Panama, Paraguay and Uruguay. The most common fiscal incentives for biofuels are tax exemptions. Exemptions from fuel taxes are available in Argentina, Chile, Colombia, Panama and Uruguay. Import tax exemptions have been enacted in Brazil, Honduras, Panama and Paraguay, while income tax exemptions can be found in Colombia, Honduras, Panama and

Uruguay. Other tax exemptions include on capital tax, as in Argentina, Honduras and Uruguay, sales tax, as in Colombia and Paraguay, and others, as in Brazil, Honduras and Panama. Tax exemptions also may include exemption from local taxes, as in Panama, or regional exemptions, as in Argentina.

BIOFUEL BLENDING MANDATES

Biofuel blending mandates establish a percentage of biofuel (ethanol or biodiesel) that must be blended with regular gasoline or diesel. Blending mandates usually specify who is responsible for the blending and at what point of the distribution chain it must be done. Blending mandates can be static or evolve over time, according to preset quantities or based on a set of indicators such as international sugar prices. National mandates can apply to the whole territory, or certain regions or metropolitan areas.

Brazil and Paraguay provide fiscal incentives for **flex-fuel vehicles**, which can run on different mixes of gasoline and bioethanol. Panama provides tax credits on biofuels and Colombia allows eligible biofuel production plants to be declared tax-free zones. Fiscal incentives to promote export of biofuels include, for example, differential export taxes for biodiesel in Argentina or export tax credits in Brazil.

Biofuels also can be promoted through **regulated biofuel prices**, although if the price is too low, it may

TABLE 6: Biofuel blending mandates in Latin America

	Argentina	Brazil	Colombia	Costa Rica ¹	Ecuador ²	Guatemala ³	Mexico ⁴	Panama ⁵	Peru	Uruguay
Ethanol	10%	27%	8-10%	0-8%	5%	5%	6%	5%	7.8%	5%
Biodiesel	10%	7%	10%	0-5%	5%				5%	5%

¹ Currently 0% until regulated; ² Ethanol blend only in Guayaquil; ³ Not implemented; ⁴ Only in Guadalajara, Monterrey and Mexico D.F.; ⁵ Temporarily suspended.

actually result in a disincentive. As the Argentina case shows, finding a right balance can be difficult, particularly in export-oriented markets, because of fluctuations in the international markets for fossil fuels, sugar and soybeans. Colombia's biofuel prices are established following a methodology that includes factors such as the international prices for sugar and palm oil and the existing blending mandates. Other Latin American countries with regulated biofuels prices include Costa Rica and Ecuador.

Energy crops for bioenergy are one of the activities where the **energy-food nexus**¹⁰ is more readily apparent. Many countries' legislations note the importance of ensuring food security, and some have taken specific measures to that effect. For example, Mexico restricts the use of corn for biofuel only to those years with an official national surplus of corn. Ecuador has zoning restrictions for palm oil, and both Ecuador and Costa

Rica have specific laws prioritising food production over biofuels production. Uruguay has established that biofuels production should minimise competition with food production for land and water.

In at least four Latin America countries, access to **finance** for biofuels-related projects is facilitated by dedicated renewable energy or renewable energy-eligible funds (see Table 4).

Some countries' support for biofuels include measures to promote **feedstock production**, such as subsidies in Panama, support for sugarcane plantations in Brazil and Ecuador and for palm oil plantations in Colombia and Nicaragua, and feasibility studies in Belize.

Colombia mandated that all **public transport** vehicles in metropolitan, district and local-level areas must run on clean fuels, which include biofuels¹¹.

4. Heating

Renewable energy for heat production has a large and unexploited potential in Latin America. There is nascent policy support for thermal uses of renewable energy in the region, with Mexico, Brazil, Uruguay, Guyana and Panama having incentives for solar water heating such as solar mandates and fiscal benefits. Some countries, such as Belize, Guatemala, Guyana and Nicaragua, have programmes to introduce solar or improved biomass cookstoves.

Nonetheless, policies to support the thermal use of renewable energy sources are scarce. Most of the development that has happened for co-generation and industrial use of biomass has been on purely commercial terms without any kind of policy intervention. In some countries, such as Paraguay, Nicaragua and Honduras, traditional biomass represents a large fraction of primary energy consumption.

National **solar mandates** have been identified in Uruguay and Panama, with sub-national mandates present in Mexico and Brazil, the latest linked to social housing programmes. Costa Rica and Uruguay have

mandated commercial users to conduct energy planning which considers the use of renewables.

SOLAR MANDATES

Solar mandates establish that subject buildings, which can range from households to commercial, industrial and public facilities, must meet a percentage of their heating needs (usually water heating) through solar energy. Solar mandates usually apply to new construction and retrofits.

Direct support for solar heating is provided in Chile, Mexico and Uruguay. In Uruguay a 50% subsidy is available through a discounted electricity rate. In Mexico, partial subsidies for solar collectors are available to mortgage holders of a social housing programme. In Chile, subsidies for solar water heaters are provided in reconstruction of disaster-affected areas as well as social housing. Panama provides incentives for solar water heating and drying. Peru subsidised passive solar heating systems (Trombe Walls²) in areas of extreme poverty above 3,500 m of altitude.

¹⁰ For an in-depth analysis of the energy-food nexus see IRENA (2015d).

¹¹ Also included are hydrogen, natural gas, LPG, low sulphur diesel and reformulated gasoline.

Fiscal incentives include tax exemptions for solar water heaters at the national level, as in Chile, Costa Rica, Uruguay and Guyana, and at the sub-national level, as in Belo Horizonte and São Paulo states in Brazil and Mexico City. Panama also offers accelerated depreciation.

Both Brazil and Uruguay have **finance** programmes for thermal renewable energy involving public banks (see Table 4). Costa Rica provides **technical advice** for turning agricultural and agro industrial waste into biogas for thermal and electricity generation uses.

5. Others

This section considers other policies and support aspects that, while not sector-specific, contribute to the enabling conditions for renewable energy deployment, or aim at renewable energy deployment as a side-effect. These include local content requirements, environmental and social impact, international development partners, currency and carbon taxes.

Local content requirements for renewable energy can be found in Brazil, Ecuador, Honduras, Panama and Uruguay. Local content requirements can be imposed in several ways, such as a percentage of investment, hiring of personnel, or use of local feedstock/materials. For example, both Ecuador and Uruguay impose percentages of staff that must be local, with Uruguay adding that the renewable energy power plant control centre must be based in the country. Local content as a percentage of investment has been used in Uruguay (20%) and Brazil (60% under PROINFA).

LOCAL CONTENT REQUIREMENTS

Local content requirements aim to create jobs and to develop local production capacity for a particular technology or link in the value chain of renewable energy, including manufacturing, production and services. Local content requirements can be imposed in several ways, such as a percentage of investment, hiring of personnel, or use of local feedstock/materials.¹³

Uruguay and Panama require that biofuels used for fulfilling their blending mandates must be nationally produced, while Honduras requires over 50% of feedstock to be locally produced for biofuels to qualify for fiscal incentives.

Local content requirements can be mandated as part of a particular renewable energy support mechanism or as a prerequisite for accessing certain benefits, as in

Brazil and Honduras. The Brazilian case is particularly interesting, with local content being a requisite to access preferential financial terms provided by the national development bank, BNDES. While Brazil's local investment requirements for renewable energy were originally formulated as a percentage of total investment, over time they have evolved into a sophisticated approach, chiefly for solar and wind. Under current local content rules in Brazil, the percentage of finance that can be obtained on preferential terms for a project is calculated through a methodology with a detailed list of components and services, including required, optional and premium for three different time periods.

Virtually all Latin American countries have environmental laws in place and **environmental impact assessments** are required for most renewable energy projects. In some cases, countries provide simplified environmental assessment procedures for renewable energy, depending on the type and scale of the project. Most small or residential level renewable energy generators are exempt from environmental impact assessments. The exemption threshold usually ranges from as low as 500 kW to as high as 10 MW in cases such as Bolivia and Brazil, but with the specifics varying from country to country. El Salvador, for example, has detailed legislation specifying precisely which solar, geothermal and hydropower plans are subject to environmental impact assessment, considering factors such as generation capacity, slope of terrain, reservoir area, protected areas and proximity to water sources, to name a few. Some countries have or are developing specific legislation addressing the development of renewable energy sources in protected areas, as for example Costa Rica and Nicaragua for geothermal. Wind power developers in Uruguay are required a decommissioning guarantee, determined on a case-by-case basis, as part of their environmental authorisation to

¹² Trombe walls are a building technique where heat collecting building materials are used in sun-facing facades and heat is then transferred to the dwelling through a passive ventilation system.

¹³ For an in-depth analysis of local content requirements for renewable energy see IRENA (2013).

ensure dismantling of the wind farm at the end of its life. In some cases, such as Nicaragua, local authorities are responsible for issuing environmental permitting for projects under certain thresholds.

Social provisions for renewable energy have been identified in the policies of Belize, Colombia, Ecuador, El Salvador and Mexico. Mexico, for example, requires a social impact assessment for all electricity generation projects. Colombia requires investment of half the revenues from the sale of carbon credits¹⁴ from the Clean Development Mechanism (CDM) in social projects in order for renewable energy projects to be eligible for fiscal benefits. Ecuador requires renewable energy generators to invest a determined amount per MWh generated in social and local development projects, the amount varying by technology, while El Salvador requires investment of 3% of revenue in social projects in the surrounding community. Belize includes social aspects in the ranking system for its auction. Colombia considers the number of jobs in biofuel plants as a criterion to award fiscal benefits.

Carbon taxes are a climate change mitigation policy that, by increasing the cost of fossil fuel technologies, arguably make low-carbon technologies such as renewable energy more competitive in that particular jurisdiction. In Latin America only two countries, Chile and Mexico, have instituted carbon taxes. Mexico's carbon tax was established in late 2013, and amounts to about USD 3/t C.¹⁵ Locally generated CDM carbon credits can be redeemed to comply with Mexico's carbon tax. This provides a minimum source of revenue to CDM projects given the uncertainties in the international carbon markets. Chile's carbon tax of about USD 5/t CO₂ was enacted in 2014 and starts in 2017. It applies to emissions from power plants of 50 MW or more (except biomass).

Currency hedging is an important element in policy design, and its absence can increase the capital cost of renewable energy projects, particularly given that most renewable energy technologies require a high upfront investment to be recovered through long revenue streams, and that in most cases technology is acquired in the international markets and denominated in US dollars. Many countries, particularly those with small or medium economies, resolve this issue by denominating their renewable energy incentives directly in US dollars. This is

the case, for example in Ecuador, El Salvador, Guatemala, Honduras, Nicaragua, Paraguay, Peru and Uruguay. Panama's currency (PAB) is pegged to the US dollar, and so was Argentina's until 2002. While Argentina's 2006 feed-in tariff was denominated in local currency (ARS), its 2009 auction and subsequent promotion policies were denominated in USD. Brazil, Chile, Colombia, and Mexico use their own currencies or derivatives as denomination for their renewable energy regulations.

The role of **international development partners** is and has been instrumental in the promotion of renewable energy in many Latin American countries. From direct financial support and project-based assistance to preferential loans, guarantees, pre-investment support, capacity building, facilitation for the elaboration of policies, resource mapping campaigns and provision of services, development partners' roles are varied and multifaceted. An interesting example is the *Guyana REDD+ Investment Fund* (GRIF), established bilaterally by Guyana and Norway as a means to channel international financing for avoided deforestation. So far it has received USD 150 million in payments from Norway, which will finance energy access and a hydropower project. Incidentally, the World Bank acts as the GRIF trustee, exemplifying another role for international development partners. Another example of the role of international development partners is the credit guarantees in Central America for up to USD 1 million for small renewable energy projects (<10 MW) provided by the ARECA (Accelerating Renewable Energy in Central America and Panama) project, a partnership of GEF, UNDP, and the Central American Bank for Economic Integration Credit. Many of the funds listed in Table 4 have the support, financial, technical or otherwise, from international development partners.

Many countries offer support for **research and development** in renewable energy, including through research grants, research programmes, dedicated student loans, as in Colombia, and dedicated funds, such as *Inova Energia* in Brazil, the *Energy Sustainability Fund for Research and Technology Development* in Mexico and the *Energy Investment Development Fund* in Nicaragua. Colombia created an official medal for the *Rational and Efficient Use of Energy and Non-Conventional Sources*, including a research category.

¹⁴ Certified emission reduction

¹⁵ Please note C is different than CO₂. Under perfect combustion conditions, 1 ton of C yields 3.66 tons of CO₂.

6. Conclusion

The renewable energy policy landscape, like the renewable energy sector itself, is in constant and rapid evolution. The Latin American region is not an exception: the region has been a pioneer in designing and implementing specific renewable energy promotion mechanisms, such as biofuel mandates and auctions. Today the region continues to play an important role in renewable energy policy innovation, as seen in this report.

This report serves as a snapshot view of the fast-changing situation of renewable energy policy in Latin America. It is primarily based on research on national sources and information contained in the *IEA/IRENA Joint Global Renewable Energy Policies and Measures Database*. A more in-depth insight into the region will be available in IRENA's forthcoming Latin American renewable energy market analysis.

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Glossary for Table 1

National Policy

Renewable Energy Target: Officially established targets for renewable energy. Projections and scenarios not explicitly mentioned as objective are not included.

Renewable Energy Law / Strategy: A specific law or strategy to promote renewable energy is in place.

Solar Heating Law / Programme: A specific law or programme to promote solar heating is in place.

Solar Power Law / Programme: A specific law or programme to promote solar power is in place.

Wind Power Law / Programme: A specific law or programme to promote wind power is in place.

Geothermal Law / Programme: A specific law or programme to promote geothermal energy is in place.

Biomass Law / Programme: A specific law or programme to promote bioenergy for uses other than transport. If the same law promotes both biomass and biofuels both columns are marked.

Biofuels Law / Programme: A specific law or programme to promote bioenergy for transport. If the same law promotes both biomass and biofuels both columns are marked.

Fiscal Incentives

VAT Exemption: VAT exemption or special refund provisions are in place.

Fuel Tax Exemption: Exemption from fuel-specific taxes are in place.

Income Tax Exemption: Exemptions from income tax are in place.

Import / Export Fiscal Benefit: Fiscal benefits for import/export of equipment, services or products are in place.

Subnational Tax Exemption: Exemption from local and regional taxes.

Carbon Tax: A carbon tax is in place.

Accelerated Depreciation: Investment can be depreciated faster than for normal business.

Other Fiscal Benefits: Other benefits not included above, including but not limited to other tax and fees exemptions, fiscal stability, and country-specific schemes.

Grid Access

Transmission Discount / Exemption: Exemptions or discounts from transmission fees are in place for eligible renewable electricity producers.

Priority / Dedicated transmission: Priority transmission in case of grid congestion and/or dedicated transmission lines for eligible renewable electricity producers.

Grid Access: Guaranteed or regulated grid access for eligible renewable electricity producers.

Preferential Dispatch: Electricity from eligible renewable energy producers is dispatched first.

Other Grid Benefits: Other grid-related benefits such as planning or other fee exemptions for eligible renewable energy producers.

Regulatory Instruments

Auctions: Government-regulated auctions are used to contract renewable energy.

Feed-in Tariff: Feed-in tariffs are available to qualifying renewable electricity producers.

Premium: A premium payment is available to qualifying renewable electricity producers.

Quota: Legally binding quotas of renewable electricity generation have been established.

Certificate System: A renewable energy certificate system is established as a means, through redemption, to comply with the quota. Only implemented together with a quota (the opposite does not apply).

Net Metering: Net metering regulations are in place for eligible renewable energy producers.

Ethanol Blending Mandate: A law mandating ethanol blending with gasoline is in place.

Biodiesel Blending Mandate: A law mandating biodiesel blending with diesel is in place.

Solar Mandate: A mandate for solar heating requirements is in place.

Registry: A mandatory registry for designated renewable energy projects has been created.

Hybrid: Policy combining one or more design elements of one of the regulatory instruments above.

Finance

Dedicated Fund: A public fund dedicated exclusively to finance eligible renewable energy projects exists.

Eligible Fund: A public fund which can finance eligible renewable energy projects exists.

Pre-investment Support: Direct or indirect support is provided for feasibility studies, resource mapping and other pre-investment activities.

Direct Funding: Direct funding, including subsidies, grants, direct investment and direct contracts, is provided to eligible renewable energy projects.

Currency Hedging: Policies are in place to hedge against currency volatility, usually denominating policy benefits in USD.

Others

Renewable Energy in Social Housing: Programmes to include thermal renewable energy uses in social housing exist.

Renewable Energy in Rural Access Programmes: A rural energy access programme exists that uses or seeks to promote renewable energy.

Renewable Energy Cookstove Programme: A programme exists to promote solar or sustainable bioenergy cookstoves, or to reduce unsustainable bioenergy cookstoves.

Local Content Requirements: Clauses requiring local content in promoted renewable energy are in place.

Special Environmental Regulations: Special, normally more favourable, environmental regulations are provided for eligible renewable energy projects.

Food / Biofuels Nexus: Laws exist with specific provisions addressing food/bioenergy nexus.

Social Requirements: Social requirements are in place for renewable energy projects, such as required social impact assessments or a mandate to dedicate a percentage of revenue in local development projects or for financing the local communities.





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