



Latin American countries have been implementing some innovative market incentives to catalyse the expansion of the green economy, in particular in relation to natural resource conservation and development of greener energy and infrastructure. This Guide explores these experiences to identify useful lessons for other regions of the world.

## PURSUING A GREEN ECONOMY: GROWTH ALONGSIDE ENVIRONMENTAL SUSTAINABILITY IN LATIN AMERICA

### SUMMARY

Developing and emerging countries around the world are seeking new strategies to decouple environmental degradation from economic growth. In Latin America, numerous countries have operationalised green economy principles in public policy with the aim of improving forest conservation, preserving watershed services, and promoting green building development and renewable energy uptake. This Guide describes the general principles of the green economy and how it can be implemented through careful management of natural resources, with a particular focus on the type of financial incentives used, including how and where they work. Drawing on case studies from across the region, the Guide also explores the principle factors behind the success of initiatives in Latin America in order to provide lessons that will be useful to other regions.



### THE TRANSITION TOWARDS A GREEN ECONOMY

More than 60% of the world's major ecosystems are now considered to be degraded or used unsustainably.<sup>1</sup> Capital has been poured into property, fossil fuels and intangible marketplaces with relatively little investment in ecosystem protection, land and water conservation, or renewable energy sources. Over the past two decades, the world economy has increased from US\$24 trillion to US\$70 trillion. Much of this rapid economic expansion has been led by developing countries – largely at the expense of natural resource sustainability. Yet over recent years, financial, economic, food and energy crises have forced governments and other actors to look more critically at the goals and rationale of traditional economic development paradigms, including their impacts on the quality of life of citizens. This emerging agenda is known as the Green Economy.

Economic success has typically been measured by calculating the value and quantity of outputs, regardless of the waste that is generated, the impact on the environment, or the non-renewable resources that are exploited. A green economy is one that makes a move away from this model by aiming to advance human well-being and social equity through

### KEY LESSONS LEARNED

New governance frameworks and financing arrangements are necessary to stimulate, manage, and regulate the flow of resources and finance in ecosystem conservation mechanisms.

The development of market instruments (such as PES) has contributed to the spread of ecosystem approaches while feed-in tariffs and preferential premiums have facilitated new partnerships in the development of longer-term renewable energy sources.

A business-friendly environment can establish the operating ground for longer-term investments needed in infrastructural transitions, particularly in renewable energy and green building initiatives.

<sup>1</sup> Reid, W. V. et al. 2005. *Ecosystems and Human Well-being: Synthesis*. Island Press, Washington, DC.



economic growth, while reducing environmental damage and ecological scarcities. In this paradigm, income and employment are driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency and prevent the loss of biodiversity and ecosystem services. The concept of a green economy does not replace sustainable development, but rather asserts that sustainability depends on getting the economy right. This often depends on domestic policies and the success of policy frameworks to promote greener growth.

Fundamental to this agenda is the incorporation of negative externalities into the evaluation of development practices and the use of market mechanisms to promote sustainable policy and practice. Based on these new ideas and practices, environmental stewardship has become a potential source of revenue, a means for sustainable operations, and an object of investment in six main sectors:

- Renewable energy
- Green buildings
- Sustainable transport
- Water management
- Waste management
- Land management

Although global transition towards a green economy is slow, Latin American countries seem to be taking some important first steps along this route, employing a range of tools to incentivise investments in forestry, water management, renewable energy and green building. This Guide offers a review of the practical experiences of strategic green economy investment in Latin America, and in doing so identifies key lessons about market incentives and the kind of partnerships facilitating this transition.

## GREEN GROWTH POLICY MECHANISMS IN LATIN AMERICA

A combination of international pressure and the incompatibility of business-as-usual practices with longer-term resource availability for productive use has spurred Latin American governments to promote new investments based on green economic principles. Latin American

governments are introducing standards and regulations to conserve, control and rehabilitate scarce environmental resources while simultaneously offering economic incentives to attract capital to conservation initiatives. 'Command or control' mechanisms such as subsidies, taxes and fines, are enabling governments to assess environmental resources and define their value, use and protection. In turn, market-based policies such as pollution taxes, tradable permits and eco-labelling are enabling governments to promote new environmental principles in investment decisions and are stimulating behavioural change. The following section explores how these mechanisms are being used in four key sectors: forest management; water management; green buildings; and renewable energy.

## PAYING FOR ENVIRONMENTAL SERVICES: FOREST CONSERVATION AND NEW SOURCES OF REVENUE

Forests provide a wide range of services and functions; they regulate water supplies, buffer floods and droughts, harbour biodiversity, and mitigate the adverse effects of greenhouse gas (GHG) emissions. Yet, forests are frequently destroyed, inadequately managed or abandoned, compromising both their non-material value, as well as the continuity of their economic value.

Between 1990 and 2010, Latin America experienced a net loss of 88 million hectares of forests (more than 9% of its total forest area),<sup>2</sup> falling for the first time to less than 50% of the total land area. With comparable loss, African forests now cover just 23% of the continent with 75 million hectares of forest converted for other use over the same twenty-year period. The scenario is similar across Asia, where more than half of the countries have experienced severe deforestation, some with greater than 70% total forest loss.<sup>3</sup> Many governments have in fact encouraged this deforestation by providing subsidies and incentives for large-scale agriculture and by failing to recognise the important benefits of ecosystem services and non-timber forest products to national development goals.

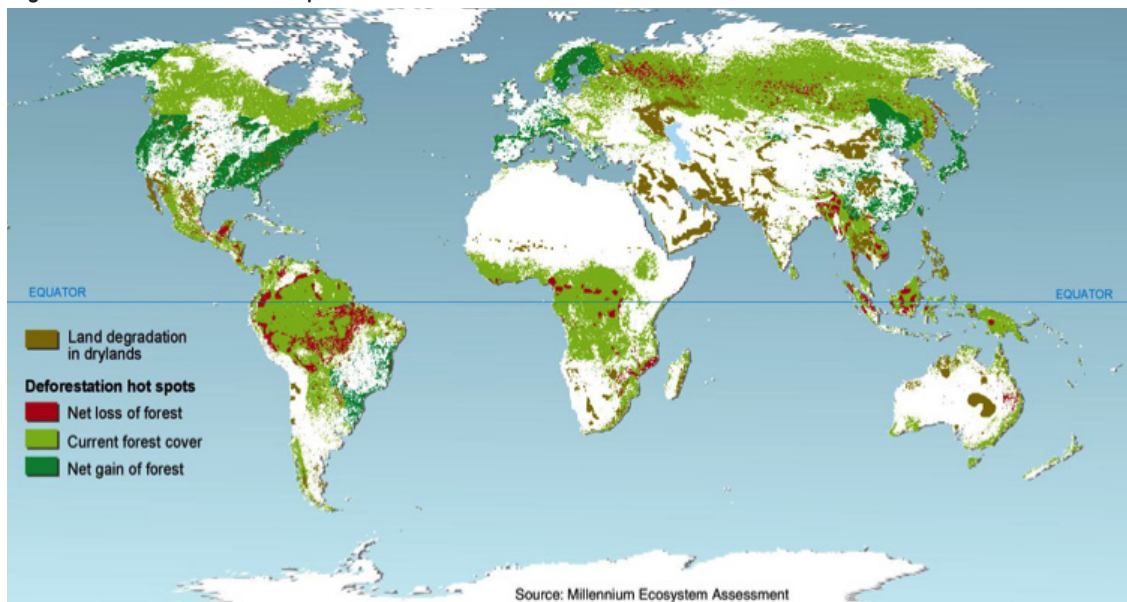
In the 1980s, the [International Tropical Timber Organization](#) reported that there were no good examples of sound forest management in Latin America. By 2001, however, the [Food and Agriculture Organization](#) estimated that 13% of forests

<sup>2</sup> Carandang, A. P. 2005. *Forest Resource Assessment – National Forest Assessment: Forestry Policy Analysis: Philippines*. FAO, Rome.

<sup>3</sup> United Nations AGF. 2012. *2012 Study On Forest Financing*. United Nations, New York.



Figure 1: Deforestation Hot Spots



Source: Rekacewicz, P., Bournay, E. 2007. UNEP/GRID-Arendal.

in Central America were under some sort of improved management regime, with some 462,000 hectares of forest plantations conserved, principally in Costa Rica and Guatemala.<sup>4</sup> This improvement can be largely attributed to payment for environmental services (PES) schemes, which are proven effective market mechanisms to manage forests (Box 1).

Some of the most advanced models in Latin America and their enabling contexts are discussed in the section that follows.

### Stimulating Livelihoods through Forest Conservation in Guatemala

In a Guatemalan PES model, communities receive the legal rights to manage and harvest forests with security of tenure guaranteed via 25-year management leases.<sup>5</sup> Harvesting rights are granted on the condition of employing sustainable forestry practices. Today, community enterprises steward over 420,000 hectares. The Forestry Communities Association of El Petén is a particularly notable example. It represents 22 communities that have obtained and managed forestry concessions. More than 10,000 people directly benefit from these forest concessions and 60,000 more receive indirect benefits. Between 2006 and 2007, the concessions produced US\$4.75 million in certified timber sales, supporting many local livelihoods.<sup>6</sup>

This scheme was developed through the combined efforts of local authorities, the central government and donor agencies

#### Box 1: Payment for Environmental Services

Payments for environmental services (PES) are voluntary, negotiated transactions between providers (usually landowners and farmers) and users (an individual, a company or an entire society) of a specific environmental service in a predefined area. The majority of PES programmes are funded by governments and involve intermediaries, such as non-government organisations, who provide technical assistance and help broker deals. Conserving forests through PES schemes involves creating financial incentives to stimulate landowners to adopt improved practices, and real results are achieved when participating communities create a local economy based on forest preservation and sustainable use of ecosystems. Long-term financing and adequate compensation are the foundations for launching successful PES programmes.

in response to the clearing of vast areas of Guatemala's northern-most region in the 1980s. During this time, no legislative or institutional framework existed to present an economic case for conserving these ecosystems or to propose a regulatory framework with financial incentives.

In the 1990s, Guatemalan environmental experts proposed the development of direct economic mechanisms that primarily would promote forest conservation on private

<sup>4</sup> Food and Agriculture Organization (FAO). 2002. *Evaluation of World Forest Resources 2000*. FAO, Rome.

<sup>5</sup> Pagiola, S., Zhang, W., Colom, A. 2008. *Assessing the Potential for Payments for Watershed Services to Reduce Poverty in Guatemala*. Poster presented at the American Agricultural Economics Association 2008 Annual Meeting, Orlando, Florida.

<sup>6</sup> World Bank. 2003. *Guatemala – Western Altiplano Natural Resources Management Project: Project Appraisal Document*. World Bank, Washington, DC.



land. In response to this internal 'expert' proposal, Guatemala passed its first forest law in 1996, which established direct payments for reforestation and conservation. Dedicated to reforestation projects and maintenance of lands with forests, the National Forest Institute would establish various incentives for landowners and administer payments.

Through this framework, municipal-level agreements can be arranged and the municipality develops its own appropriate implementation mechanisms. Under this model, the national government is generally responsible for carrying out hydric studies, developing carbon quantification methodologies and management plans, as well as the codification of legal contracts and collection systems. Collection rates and contract management are negotiated locally by the municipality in conversation with private parties and local residents.

### **Forest Grants Offer Incentives for Family Conservation in Brazil**

The Brazilian state of Amazonas was at risk of losing a projected 50 million hectares of trees by 2050, accounting for around 30% of its forest cover.<sup>7</sup> Recent government-led reforms created a legal and policy framework for the use of an economic instrument called *Bolsa Floresta* (Forest Grant). Under this pioneering payment scheme, forest grants are paid to those families who attend training programmes on climate change and sustainability and those who make voluntary zero deforestation commitments receive a monthly payment of US\$23 after signing a voluntary commitment. Stipends of US\$1,140/year are also paid at the community level. Participation is open to families, communities or family associations that register for the programme. Modes of payments vary according to the type of participant. Evolving policies now include the eligibility requirement that families must reside for a minimum of two years in a conservation unit to avoid migration to these areas. Amazonas now has a relatively low deforestation rate and 46% of its forests – around 164,000 km<sup>2</sup> – are protected, representing some 41% of all protected forests in the Brazilian Amazon.<sup>8</sup>

The institutionalisation of the programme was established by Law number 3,135 (State Policy on Climate Change) and the Complementary Law number 53 (State System for Protected

Areas). It was designed and coordinated by the Secretariat for the Environment and Sustainable Development (SDS) of the State of Amazonas. Through internal meetings with SDS and state bodies, the [Sustainable Amazon Foundation](#) was created with the mission of managing environmental products and services from state conservation units. A core project of this initiative, the implementation of *Bolsa Floresta's* included dozens of discussions with communities throughout the region to evaluate and refine the rules of engagement.

### **Consumer Financed Conservation in Brazil**

In 1992, the Brazilian Silvicultural Society founded [Cerflor](#), the National Forest Certification Programme. The goals of certification are to support sustainable forestry within Brazil and to brand and distinguish sustainably sourced Brazilian forest-based products from those of other countries. The branding is meant to encourage both the economic basis for the expansion of more sustainable practices while also creating a new kind of consumer awareness. By 2002, plantation forests on 822,000 hectares had already been certified by the [Forest Stewardship Council \(FSC\)](#)<sup>9</sup> and over 358,000 additional hectares were planted across the greater Amazon and Atlantic forests.

There is a strong economic case for certification. In the township of Paragominas in the state of Pará, Brazil, for example, the saleable timber volume in a sustainably managed area is at least 30% greater than that obtained from a neighbouring site administered by conventional practices (38.6 m<sup>3</sup>/ha versus 29.7 m<sup>3</sup>/ha, respectively). Sustainable logging practices in Paragominas are estimated to be 35% more lucrative in net terms than conventional operations because of smaller losses from clearing thanks to better planning and layout, reduction in waste associated with reduced impact logging (RIL), and improved information sharing amongst crews. Another approach in Paragominas demonstrated that switching to RIL decreased operational costs by 12% and net revenues were 19% higher due to the aforementioned management improvements.<sup>10</sup> Thus, the primary factors driving implementation of RIL are increased productivity and reduced harvesting costs, achieved through more careful treatment during harvesting (such as repeated

<sup>7</sup> World Wildlife Fund. 2011. [WWF Living Forests Report. Chapter 1: Forests for A Living Planet](#). WWF, Washington, DC.

<sup>8</sup> FAO. 2012, see n4 above.

<sup>9</sup> The FSC is an independent, non-governmental, not-for-profit organisation established to promote the responsible management of the world's forests through certification processes at multiple scales.

<sup>10</sup> Holmes, T. P. et al. 2002. [Custos e Benefícios Financeiros da Exploração Florestal de Impacto Reduzido em Comparação à Exploração Florestal Convencional na Amazônia Oriental \(Financial Costs and Benefits of Reduced-Impact Forest Exploitation Compared to Conventional Forest Exploitation in the Eastern Amazon Region\)](#). Fundação Floresta Tropical, Belém.





### Box 2: Certification and Voluntary Markets

Voluntary markets are not driven by regulation, but by the value placed on the environmental good or service by the buyer. Voluntary markets generally follow the PES model, where buyers (motivated by altruism, self-interest) are willing to pay landowners to maintain or enhance ecosystem services (including water purification, flood control and carbon sequestration). Voluntary markets use implementation measures that are low cost and flexible and they also provide flexibility in experimentation of new approaches as rules are modified according to market response.

vine-cutting) and planning (of rows and machinery used).

In general, deforestation is hard to control because it is often linked to perverse incentives and a lack of monitoring. Latin American experience with PES schemes shows that real results are often achieved when a local economy based on forest preservation and the sustainable use of ecosystems is developed for and by local communities. In each of the cases discussed above, strong political commitment, local ownership, and a relevant financial mechanism were key to the success and continuity of these PES programmes. For more information and specific details of implementation in Brazil, Costa Rica and Mexico, see [ELLA Brief: Payments for Environmental Services: A Market Mechanism Protecting Latin America's Forests](#).

## FINANCING WATERSHED PROTECTION IMPROVES WATER QUALITY AND BENEFITS STAKEHOLDERS

Over 80% of sewage in developing countries is discharged untreated directly into water bodies.<sup>11</sup> Industries are some of the main culprits, dumping an estimated 300-400 million tonnes of heavy metals, toxic sludge and other waste into water sources each year.<sup>12</sup> In Latin America, between 40% and 60% of water is sourced from aquifers that are being polluted from over-mining and agricultural run-off.<sup>13</sup> What is more, sewage from less than 14% of households is treated, intensifying ecological damage to the region's water systems. Lenient pollution controls and weak enforcement regimes in Asia have meant that many multinational companies have

moved their operations from countries with stricter rules to this region, where 42% of deaths are associated with unsafe or inadequate supplies of water and sanitation.<sup>14</sup> Similarly, in Africa pollution from pesticides, fertilisers and industrial effluent contribute to water pollution and scarcity.

Although polluted water greatly reduces a country's capacity for development and options for productive use, the protection of water resources, in particular, has been ignored by many governments in favour of prioritising the need to maximise economic output. Agricultural production, an economic foundation for many developing countries, for example, is a leading driver of deforestation, resulting in loss of ecosystem services like water filtration and regulation. This loss, in turn, threatens the country's supply of agricultural products. Private businesses face operational and reputational risks as a result of this environmental damage.

In a green economy, incentives motivate particular individual or group action through remunerative or material reward. Incentives typically include fee exemptions, low-cost loans, and in-kind contributions (such as land or infrastructure). In terms of water management, a number of innovative market-based instruments are being employed to assign financial equivalents to pollution costs. These mechanisms are producing new sources of revenue to manage pollution and promote behavioural change amongst key polluters, resulting in improved water availability and quality.

### Multiple Financing Arrangements to Protect Watersheds from Pollution

#### *Increasing Abatement and Revenue through Tariffs in Brazil*

In Brazil, effluent charges are applied to pollution emissions in an effort to both decrease negative environmental impacts and finance the work of state environmental agencies in charge of pollution abatement. In Rio de Janeiro, for example, effluent charges on food processing and pharmaceutical industries have contributed to reductions in water use and subsequent wastewater production by up to 49% and 62% respectively over a six year period.<sup>15</sup>

Though a country abundant in water resources, heavy pollution from industry, sewerage leaks and untreated wastewater pose threats to the population and productive economy alike. In

<sup>11</sup> World Health Organization. 2008. [Progress on Drinking Water and Sanitation: Special Focus on Sanitation](#). WHO, Geneva.

<sup>12</sup> United Nations Environment Programme. 2010. [Clearing the Waters: A Focus on Water Quality Solutions](#). UNEP, New York.

<sup>13</sup> Comisión Nacional del Agua. No date. [Water Problems in Latin America](#). World Water Council 4th World Water Forum.

<sup>14</sup> WHO. 2008. [Cause-specific Mortality, 2008: WHO Region by Country](#). WHO, online database accessed 7<sup>th</sup> June 2013.

<sup>15</sup> Kuylenstierna J., Najlis P. 1998. [The Comprehensive Assessment of the Freshwater Resources of the World: Policy Options for an Integrated Sustainable Water Future](#). In: *Water International* 23(1) 17-20.





response, Brazil became the first country in Latin America to use tariffs levied in the form of an industrial sewage charge based on pollutant content to tackle this problem. To learn more about the finance and monitoring structure, read [ELLA Brief: Economic Instruments for Water Pollution Management in Latin America](#).

#### *Paying Farmers to Curb Negative Output in Ecuador*

In the town of Pimampiro, Ecuador, the local government makes payments ranging from US\$6 to US\$12 per hectare/year to farmers to conserve forests and natural grasslands in the area surrounding the town's water source.<sup>16</sup> In 2000, prior to the initiation of this PES scheme, 198 hectares, equivalent to 31% of the watershed, had been cleared for cropland and pasture. Such clearing of cropland reduces the capacity for the area provide natural filtering services to water quality and reduces percolation. Since then, agricultural land use has fallen to 88 hectares or 14%, with a corresponding increase in the area that has reverted back to natural vegetation. In addition, timber extraction has all but ceased.

A municipal account with a balance of approximately US\$15,000 affords a financial guarantee of payments to members of the New America Association (a formal association of landowners in the region) who fulfil their contractual obligations. The Corporation for Natural Resource Development ([CEDERENA](#)), a local NGO, acts as intermediary by classifying the land according to categories and measuring each area. Monthly payments are determined based on available resources, and are a result of political negotiation rather than a technical analysis of the hydrology, water valuation, or the financial planning of the fund.

#### *Pollution Reduction Targets through Standardised Fiscal Incentives in Mexico*

In Mexico, as in most nations, agricultural run-off and industrial activity is responsible for introducing toxic and hazardous substances into water bodies. In response, the government has developed a pollution charge for all discharges that exceed official standards. Through these official norms, each industrial sector is assigned a limit for pollutant emissions for

each cubic metre. In the first seven years of implementation, revenue increased 300% – from around US\$2.2 million to US\$6.6 million<sup>17</sup> – increasing revenue for the installation of new water treatment mechanisms. To learn more about this experience, read the [ELLA Brief: Economic Instruments for Water Pollution Management in Latin America](#).

#### *Polluters-pay and Finance Multiple Investments in Future Water Quality in Colombia*

For over twenty years, Colombia has had a system for creating and implementing environmental standards, mandates and monitoring mechanisms. However, faecal coliform levels in the country's rivers are some of the highest in the world, with 97% of sewage being released, untreated, into the rivers. Rising costs associated with cleaning the water rendered the current pollution loads and management processes unsustainable. With the national codification of environmental and compensatory taxes for direct and indirect use of resources, regional environmental authorities were encouraged to develop local implementation schemes.

The autonomous regional river basin authority of Antioquia ([CORNARE](#)) has succeeded in reducing pollution in the productive sector through the implementation of a polluter-pays tax for quantities and qualities of discharge. With the on-going assistance of the Ministry's Office of Economic Analysis, CORNARE reviews comprehensive data on water quality indicators aggregated from state researchers, distinct polluting entities, and from polluting entities themselves. Baselines are then established, formulated by national regulations according to discharges measured and parameters agreed upon locally, as determined for specific discharge points within the watershed.

Together, the regional environmental authorities, polluting firms and downriver stakeholders agreed upon a distributive arrangement to support regenerative projects: 50% of the revenue is used to co-finance municipal pollution reduction projects; 30% is invested in industrial reengineering and cleaner production; 10% goes towards environmental science and technology research, environmental education, and dissemination of information about the tax. The other 10%

<sup>16</sup> Echevarria, M. et al. 2004. *The Impacts of Payments for Watershed Services in Ecuador: Emerging Lessons from Pimampiro and Cuenca*. International Institute for Environment and Development, London.

<sup>17</sup> Huber, R. M., Ruitenbreek, J., Serôa da Motta, R. 1998. *Market Based Instruments for Environmental Policymaking in Latin America and the Caribbean. Lessons from Eleven Countries*. World Bank, Washington, DC. Values are calculated from currency exchange rates from 1997.



goes towards operating expenses. CORNARE reports a 31% BOD<sup>18</sup> reduction and 47% TSS<sup>19</sup> reduction in regional water bodies.<sup>20</sup> This approach was also successfully implemented in the ecologically sensitive area of Rio Negro where watershed water pollution from industrial sources was reduced by 28%.<sup>21</sup>

## RENEWABLE ENERGY SCHEMES ATTRACTING INCREASING INVESTMENT

Over the last decade, the cost of electricity generation from fossil fuels has increased over 500% (from US\$17 to over US\$100 per barrel of oil) while the capital cost of renewable energy technologies has decreased by at least 50%.<sup>22</sup> Limited access to energy or ‘energy poverty’ is a significant challenge to achieving the MDGs in Latin America, Africa and Asia. Yet, within these three regions lies the world’s largest potential for renewable energy power generation, through vast solar, biomass, hydropower and wind resources. Governments and private companies have been tapping into this potential with renewable energy investments growing spectacularly in all three regions since 2005.

Renewable energy (including hydropower) is shifting from the fringe to the mainstream of energy development objectives in developing and emerging nations alike. New financial investments in clean energy in Latin America (not including Brazil) rose 127% in 2012 as compared to 2011 figures, to US\$4.6 billion; the biggest absolute increase in renewable energy investment worldwide. This mirrors the trend of renewable markets, manufacturing, and investment shifting increasingly towards developing countries during 2012 in response to oversupply and slow growth in the global North, accompanied by falling prices and innovations in financing globally. According to a new report commissioned by the Inter-American Development Bank,<sup>23</sup> Latin America’s renewable energy endowment is large enough to cover its projected 2050 electricity needs 22 times over.

Today, about 5% of electricity supply in Latin America is being generated from renewable sources and the region’s governments are setting ambitious targets that aim to dramatically increase the share of non-conventional renewables in national energy portfolios. This shift is being

stimulated by a range of tools including new regulations and market-based incentive systems, such as the popular feed-in tariff schemes (Figure 2).

**Figure 2: Mechanisms for Promoting Renewable Energy Development in Latin American Countries with Targeted Policies in Place**

Country	Type of Mechanism				
	Renewable Energy Targets	Feed-in Tariffs	Capital Subsidies, Grants, Rebates	Energy Production Payments, Investment or Tax-Credits	Public Competitive Bidding and Tendering
Argentina	X	X	X		X
Brazil	X			X	X
Chile	X		X	X	X
Colombia	X				
Costa Rica	X				
Dominican Republic	X	X	X	X	
Ecuador		X		X	
El Salvador				X	X
Guatemala	X			X	X
Mexico	X			X	X
Nicaragua		X		X	
Panama				X	
Peru				X	X
Uruguay	X				X

Sources: Adapted from Latin American Private Equity and Venture Capital Association, 2010. [Latin American Policy Changes: Investing in Renewable Energy, Climate Change and Clean Technology](#). LAVCA, online publication; Trubish, H. K. 2011. [Renewables South of the Border](#). Greentech, online publication.

The capital cost of electricity generated from renewable energy technologies has decreased substantially due to the increasing marketability of renewable technologies as a result of incentives. In Latin America, feed-in tariffs have been the most successful approach to long-term investment in renewable energy. As a result, electricity generation from renewable energy sources can be cost-competitive with conventional fuel, particularly in areas where electricity prices are high (Box 3). The employment of renewable energy sources, together with efforts to improve energy efficiency, reduces dependence on fossil fuels, mitigates greenhouse gases and

<sup>18</sup> BOD is the measurement of the amount of dissolved oxygen needed by aerobic biological molecules in a body of water to break down organic material present in a given water sample at certain temperature over a specific time period. It is a measurement of the organic compounds in a water body whereby excessive growth results in an oxygen deficit, ultimately shutting down life in an ecosystem.

<sup>19</sup> Total Suspended Solids as measured by filter pore size and actual weight of particulate material.

<sup>20</sup> Kraemer, A. R., Pielen, B., Leipprand, A. 2003. [Economic Instruments for Water Management](#). IDB, Washington, DC.

<sup>21</sup> Sterner, T. 2003. [Policy Instruments for Environmental and Natural Resource Management](#). RFF Press, Washington, DC.

<sup>22</sup> Energy Information Administration. 2013. [Annual Energy Outlooks 2013](#). EIA, Washington, DC.

<sup>23</sup> IDB. 2013. [Rethinking Our Energy Future](#). IDB, Washington, DC.





pursues steps towards developing a local green economy. In Latin America, Argentina increased its investments in renewable energy by 568% to US\$740 million from 2009 to 2010, and Peru's investment doubled to US\$480 million. Chile saw a 21% increase to US\$960 million.<sup>24</sup>

### Box 3: Feed-in Tariffs

Feed-in tariffs – or FITs – are policy mechanisms designed to accelerate investment in renewable energy technologies. They offer long-term contracts to renewable energy producers to sell energy at a guaranteed fixed price through a legal contract – known as a Power Purchasing Agreement – and for a specific period of time, usually between 5 and 20 years. Prices are typically set based on the cost-generation of each technology, project size and at a premium compared to electricity from conventional sources. FITs also often include a mechanism by which tariffs ratchet down over time to encourage technological costs reductions.

The goal is to offer cost-based compensation by providing price certainty and long-term contracts to help finance investments in renewables. [The IPCC Fourth Assessment Report](#) emphasises that incentives to support 'green power' by rewarding performance, such as feed-in tariffs, are preferable to a capital investment grant because they encourage market deployment while simultaneously promoting increases in production. Tariffs are normally calculated to offer a 5 to 8 per cent return on initial investment, which, with adjustments for inflation, could rise to between 7 and 10 per cent. At the household level, the incentive also states that any income derived from residential renewable electricity will not be taxable.

For a description of other implementation measures, read the [ELLA Brief: Incentives for Electricity Generation in a Green Economy: Effective Frameworks from Latin America](#).

### Feed-in Tariffs Attract Investment in Argentina and Peru

In Argentina, feed-in tariffs for promoting the generation of renewable energy started in 1998 with Law No. 25.019 establishing for the first time payment of a premium to independent wind and solar power producers at a top-of-the-market price at the time of sale to the national grid. This amounted to US\$0.32/kWh for wind energy and was secured for fifteen years. Subsidies of US\$0.15/kWh were offered at a national level, with feed-in tariffs further elaborated at the provincial level depending on the kind of energy used. The same law also provided tax incentives in the form of delayed remittances of value-added tax for fifteen years.

In 2006, the Argentinean government passed the [Promotion of Renewable Sources of Energy for Electricity Production Law](#) to offer financial incentives for renewable energy development. The law includes price-driven instruments such as deferred tax payments and defined feed-in tariff premiums for a larger range of renewable technologies with an entitlement period of 15 to 20 years. The updated tariff for energy from photovoltaic systems is US\$0.30/kWh and US\$0.51/kWh if electricity is generated through wind technology. For all other sources with a generating capacity of up to 30MW (namely, geothermal, tidal, biomass, biogas and small-scale hydropower), the feed-in-tariff paid by the Argentine government is EUR 0.51/kWh.<sup>25</sup> Building a favourable policy environment has enabled Argentina to increase investments in renewable energy from virtually nothing to US\$740 million (around a 568% increase) between 2011 and 2012. Renewable energy currently constitutes more than 7% of the country's energy mix.<sup>26</sup>

The Peruvian government has similarly promoted renewable energy through comprehensive feed-in tariffs and preferential premiums. Between August 2009 and February 2010, under the 2008 [Renewable Energy Investment Promotion Law](#) (REIPL), the Peruvian government's Energy and Mining Regulator, the Supervisory Agency for Investment in Energy and Mining ([OSINERGMIN](#)), held its first auction for licences to build 200 MW of energy generation through solar, wind and biomass provision, and a further 300 MW for mini-hydro projects to supply the national grid.<sup>27</sup> The government paid feed-in tariffs to auction winners of US\$0.087/kWh for wind

<sup>24</sup> United Nations Environmental Programme. 2013. [Renewables 2013. Global Status Report](#). UNEP, New York.

<sup>25</sup> Holmes *et al.* 2002, see n10 above.

<sup>26</sup> International Renewable Energy Agency (IRENA). 2010. [Renewable Energy Country Profile: Argentina](#). IRENA, Abu Dhabi.

<sup>27</sup> UKTI, UK Trade & Investment. 2010. [Renewable Energy Opportunities In Peru: Sector Briefing, UK Trade & Investment](#). British Foreign and Commonwealth Office (FCO), London.





energy, US\$0.0225/kWh for solar technology, US\$0.0635/kWh for energy generated through biomass and US\$0.06/kWh for hydroelectricity.<sup>28</sup> The government has not only provided a guarantee that it will purchase the renewable energy, but it also set premiums above electricity tariffs to ensure at least 12% profit to renewable energy producers.<sup>29</sup> Government subsidies for electricity production from oil, natural gas and other fossil fuels totalled US\$62 billion in 2008, but were subsequently phased out completely the following year.<sup>30</sup>

#### *New Governmental Partnerships Promote Long-term Renewable Energy Contracts in Chile*

Between 2011 and 2012, Chile saw a 21% increase in renewable energy investments to US\$960 million.<sup>31</sup> By enacting the Development of Non-Conventional Renewable Energy (NCRE) Law in 2007, Chile became the first and only country in Latin America to require that energy utilities ensure that a portion of the energy they supply comes from NCREs or pay a penalty. The regulation was modified in 2008 to introduce a quota system that determined that at least 10% of the energy traded by generators should be produced by renewable sources. For the past 5 years, investment decisions have been formalised through long running energy contracts promoted and approved by the government, with the Argentinean wholesale electricity market administration company [Cammesa](#) as the final counterpart. This mechanism allows South American Argentinian Energy ([ENARSA](#)) (the state owned energy company) to play an active role in the power market. ENARSA conducts auctions to contract specific technologies and auction-derived contracts are signed between the winning company – in this case in Chile – and ENARSA.

## GREEN BUILDINGS ON THE RISE

In some countries in Latin America, green building initiatives have achieved significant reductions in energy consumption, water use, carbon dioxide emissions, and solid waste, as well as reducing operating costs. In the densely populated city of

Sao Paulo, for example, less carbon dioxide is emitted per capita than the national average, about half in this case.<sup>32</sup> The development of green buildings in the city is largely responsible for this difference.

Economically, green building is increasingly attractive. It is often the case (despite popular perception) that premiums associated with green buildings and efficiency retrofits are cost negative, thus contributing to savings over the long run.<sup>33</sup> Development banks and international agencies are increasingly active in green building financing as building energy efficiency is one of the most cost effective measures for transitioning to a green economy.

Every dollar spent on energy efficiency equates to a 2.2 tonne reduction in CO<sub>2</sub>, while every dollar spent on renewable energy is only equivalent to a 0.4 tonne reduction in CO<sub>2</sub>.<sup>34</sup> In countries that lack mechanisms to regulate building efficiency, voluntary certification systems are a great starting point to catalyse the adoption of green buildings.

Given the barriers to wider adoption of green buildings in Latin America, such as higher upfront costs compared to conventional buildings, high levels of poverty, lack of public awareness and few green building professionals, the involvement of governments, international organisations, and development banks is critical for improving and expanding green options for the low-income housing sector.

However, scalability is an iterative process and, generally, it is only possible to launch a large-scale green low-income housing programme after specific development and technologies have first be piloted. For more information on the transition to a greener economy through green buildings in Latin America see [ELLA Brief: Green Building in Latin America](#).

<sup>28</sup> DeMartino, S., Le Blanc, D. 2010. *Estimating the Amount of a Global Feed-in Tariff for Renewable Electricity*. United Nations Department of Economic and Social Affairs, New York.

<sup>29</sup> Bouille, D. 2009. *Policy Considerations For Scaling Up Renewable Energy In Latin America*. Renewable Energy Forum, Leon.

<sup>30</sup> International Energy Agency. 2010. *Fossil-fuel Consumption Subsidy Rates as a Proportion of the Full Cost of Supply*. IEA, Washington, DC.

<sup>31</sup> UNEP. 2013, see n25 above.

<sup>32</sup> World Resources Institute. *Sustainable Cities Presentation*.

<sup>33</sup> Scott, M. 2013. *Market for Green Buildings Warms Up*. Financial Times, online publication.

<sup>34</sup> Managan, K. et al. 2012. *Driving Transformation to Energy Efficient Buildings: Policies and Actions: 2nd Edition*. Institute for Building Efficiency, Johnson Controls, Milwaukee, WI.



## **Strong National Legislation**

Strong national legislation has been fundamental for the development of effective environmental policies. In all of the Latin American case studies, explicit national prioritisation and subsequent legislation surrounding ecosystem protection was a prerequisite for action. With PES, international pressure and national focus on the links between GHG emissions and hydrological regulation motivated policy shifts. The resulting political and financial support facilitated the quantification process for various outcomes. In water pollution management, governmental incentives, finance and sanctioned standards have catalysed shifts in pollution emissions. In promoting renewable energy investments, national government policies were fundamental in the evaluation of market opportunities and barriers to entry. In this sense, national governments have a strong role to play in preparing technical (biophysical) studies and economic feasibility assessments.

## **Robust Financing Structures and Partnerships**

The key barriers to wider adoption of greener practices in Latin America seem to be higher upfront costs and historical use of certain infrastructure models. Partnerships between professional associations, investors, research institutions and legislators are needed (in particular for renewable energy and green building) to begin to remove these barriers. In Latin America, long-term funding for PES programmes was secured through a combination of: i) multi-stakeholder coalitions operating a system of taxation; ii) grants and loans from international banks; and iii) charges for using environmental resources. Specific to water, new financing structures involving users at all levels, from industrial to domestic consumption, promote responsible use and disposal and create a framework for distributing costs. Creative financing mechanisms assign value to pollution costs and help generate the revenue necessary to improve water quality conditions. To reach relevant scales, renewable energy policies require ambitious targets and the development of financial incentives to secure buy-in of all market players: technology manufacturers, installation and

maintenance firms, environmental agencies, NGOs, research programmes, financial institutions and project developers. In Latin America, the development of renewable energy was only initially linked to the attractiveness of financial incentives, such as the case in Peru and Argentina. These incentives have been particularly successful when coupled with tax exemption schemes and legally binding renewable energy targets. A business friendly environment is also necessary for establishing the operating ground for the longer-term investments needed for green building projects.

## **Decentralisation and Local Implementation Capacity**

When behaviours surrounding ecosystem degradation necessitate change, knowledge of demographic composition, types of stakeholder groups and social organisation is essential. In both forestry and the green building context, voluntary certification has been successful in catalysing stakeholder involvement and private investments. Particular to PES models, the participation of the people who own and/or reside on the land in question is fundamental to operations. In this case local level governments have an important role to play in facilitating the administration of titles, carrying out ecological zoning and incorporating community price and service preferences into planning and implementation. Local implementation capacity is particularly salient in the agreements developed between local stakeholders in Costa Rica and Colombia for defining relevant and appropriate baseline conservation targets.

## **Effective Monitoring**

Rigorous and localised monitoring facilitates the transition to more comprehensive policies. In Colombia, CORNARE collects data on the location of polluters, classified by economic sector and sub-sector. This information made the process of agreeing on regional clean-up targets clearer, and the results more precise. Moreover, previous dialogue with leaders within these sub-sectors led to agreements on cleaner production. This was highly significant since these groups represented over 90% of identified water pollution sources.

- 1 New governance and financing arrangements are necessary to stimulate, manage and regulate the flow of resources and finance in ecosystem conservation mechanisms.
- 2 The development of market instruments (such as PES) has contributed to the spread of ecosystem approaches, while feed-in tariffs and preferential premiums have facilitated new partnerships in the development of longer-term renewable energy sources.
- 3 A business-friendly environment can establish the operating ground for longer term investments needed in infrastructural transitions, particularly in renewable energy and green building initiatives.
- 4 While forest resource exploitation may appear to have higher immediate value than conservation in low-income countries, public sector agencies, private companies and non-profit organisations have an important role to play in improving overall financial benefits through longer-term funding commitments.
- 5 The effectiveness of polluter-pays mechanisms depends on consistent and reliable regulation, implementation and monitoring.
- 6 Attractive financial packages can catalyse longer-term investments in new infrastructure. In renewable energy and green building, economic incentives such as subsidies and low bidding rates can facilitate this shift. Contrary to popular perception, this is possible in developing and emerging nations alike: Latin American investments in renewable energy are some of the highest in the world, with countries in Africa and Asia following closely.

## CONCLUSION

Latin American experience demonstrates that economic instruments play an essential role in promoting the adoption of environmental values in diverse sectors. The case studies presented in this Guide demonstrate that strong governance and financial incentives can stimulate, manage and regulate the flow of resources to ecosystem conservation. While contexts may vary from those in Africa and Asia, lessons from the Latin America region indicate that various organisational and financial structures supported by visionary governmental policies can promote locally appropriate steps towards a greener economy.

## LEARN MORE FROM THE ELLA BRIEFS

These four ELLA Briefs provide analysis of some of the most important advances related to the green economy in Latin America.

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What are the success factors behind Latin America's use of economic instruments to improve water quality and generate new revenue for abatement?

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Latin American countries are implementing innovative policy

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[Green Building in Latin America](#)

Amidst rapid urbanisation, Latin American countries have been scaling-up green building, in some cases achieving significant reductions in energy consumption, water use, carbon dioxide emissions, and solid waste. Here's how...

## KNOWLEDGE PARTNERS

Below is a sample of some of the most influential organisations researching and working on the green economy, forest conservation, water management, green buildings and renewable energy in Latin America. For additional information about these and other organisations, read the [ELLA Spotlight on Organisations](#).

The [World Green Building Council](#) (WorldGBC), Americas Regional Network (ARN) supports 24 Green Building Councils across the Americas, facilitating cooperation and driving the growth of the green building market in the region. By working



to integrate these goals into national strategies, ARN aims to decrease the impact of cities on the region’s abundant natural resources and biodiversity.

The Organisation of American States, [Renewable Energy in the Americas Initiative](#), aims to encourage, support and facilitate replicable projects in the Latin American region, build partnerships for the adoption of these technologies and provide political, financial and institutional strategies to create the right enabling environments. The REIA initiative is also a renewable energy information hub that provides access to information on renewable energy technologies, as well as a host of publications on on-going projects.

The [Amazon Fund](#) in collaboration with the [Amazonia Association](#) creates incentives for rainforest preservation through conservation sponsorships from donors. The [Amazon Fund Brazil](#) was established to increase in-country administration and implementation, and is run by the Brazilian Development Bank (BNDES). From 2009 to 2012, the Fund has approved 36 projects, with an average term of three years per project and totalling US\$215.2 million in funding.

The [Fund for the Protection of Water](#) (FONAG) is a water fund made up of public and private organisations surrounding the metropolitan region of Quito, The Fund constitutes a payment for environmental services scheme where local water users, including hydropower and water supply companies, contribute regularly under a self-taxing arrangement. Revenue from interest and investments derived from fund equity are used to finance activities aimed at conserving the basins that supply water resources.

The [Heredia Public Service Enterprise](#) in Costa Rica, pays for watershed conservation using funds derived from a levy on consumers. This social equity and user-pays initiative has proven to be a high-benefit, low-cost investment strategy and is self-sufficient from both government and international aid in its administration and funding.

## RECOMMENDED READING

The following is a selection of some of the key publications related to the green economy in Latin America. For more information about these and other publication, see the [ELLA Spotlight on Publications](#).

Bennett, G., Nathaniel, C., Hamilton, K. 2012. [Charting New Waters: State of Watershed Payments 2012](#). Forest Trends, Washington, DC.

Economic Commission for Latin America and the Caribbean (ECLAC), Division of Natural Resources and Infrastructure. 2012. [Water and a Green Economy in Latin America](#). United Nations, New York.

Food and Agriculture Organization (FAO). 2012. [State of the World’s Forests 2012](#). FAO, Rome.

Greiber, T. 2009. [Payments for Ecosystem Services: Legal and Institutional Frameworks](#). International Union for the Conservation of Nature (IUCN), the Katoomba Group, Gland.

Inter-American Development Bank (IDB). 2012. [Climatescope 2012: Assessing the Climate for Climate Investing in Latin America and the Caribbean](#). IDB, Washington, DC.

IDB. 2012. [Green Buildings Workbook: A Guide for IDB Practitioners](#). IDB, Washington, DC.

International [Renewable Energy Agency \(IRENA\)](#). 2013. [Renewable Energy Auctions in Developing Countries](#). IRENA, Abu Dhabi.

Katoomba Group, Forest Trends, UNEP. 2008. [Payments for Ecosystem Services: Getting Started](#). Katoomba Group, Forest Trends, UNEP, Nairobi.

Sistema Económico Latinoamerica. 2012. [The Vision of the Green Economy in Latin America and the Caribbean](#). SELA, Caracas.

Weisher, L. *et al.* 2011. [Grounding Green Power: Bottom-Up Perspectives on Smart Renewable Energy Policy in Developing Countries](#). The German Marshall Fund, Washington, DC.

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