Renewable energy in Latin America
Norton Rose Fulbright

Norton Rose Fulbright is a global law firm. We provide the world’s preeminent corporations and financial institutions with a full business law service. We have 3800 lawyers and other legal staff based in more than 50 cities across Europe, the United States, Canada, Latin America, Asia, Australia, Africa, the Middle East and Central Asia.

Recognized for our industry focus, we are strong across all the key industry sectors: financial institutions; energy; infrastructure, mining and commodities; transport; technology and innovation; and life sciences and healthcare.

Wherever we are, we operate in accordance with our global business principles of quality, unity and integrity. We aim to provide the highest possible standard of legal service in each of our offices and to maintain that level of quality at every point of contact.

Norton Rose Fulbright US LLP, Norton Rose Fulbright LLP, Norton Rose Fulbright Australia, Norton Rose Fulbright Canada LLP and Norton Rose Fulbright South Africa Inc are separate legal entities and all of them are members of Norton Rose Fulbright Verein, a Swiss verein. Norton Rose Fulbright Verein helps coordinate the activities of the members but does not itself provide legal services to clients.

More than 50 locations, including Houston, New York, London, Toronto, Hong Kong, Singapore, Sydney, Johannesburg, Dubai.

Attorney advertising

References to “Norton Rose Fulbright”, “the law firm”, and “legal practice” are to one or more of the Norton Rose Fulbright members or to one of their respective affiliates (together “Norton Rose Fulbright entity/entities”). No individual who is a member, partner, shareholder, director, employee or consultant of, in or to any Norton Rose Fulbright entity (whether or not such individual is described as a “partner”) accepts or assumes responsibility, or has any liability, to any person in respect of this communication. Any reference to a partner or director is to a member, employee or consultant with equivalent standing and qualifications of the relevant Norton Rose Fulbright entity. The purpose of this communication is to provide information as to developments in the law. It does not contain a full analysis of the law nor does it constitute an opinion of any Norton Rose Fulbright entity on the points of law discussed. You must take specific legal advice on any particular matter which concerns you. If you require any advice or further information, please speak to your usual contact at Norton Rose Fulbright.

© Norton Rose Fulbright LLP. NRF24758 04/16. (UK) Extracts may be copied provided their source is acknowledged.
## Contents

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renewable energy in Latin America</td>
<td>04</td>
</tr>
<tr>
<td>Argentina</td>
<td>05</td>
</tr>
<tr>
<td>Brazil</td>
<td>07</td>
</tr>
<tr>
<td>Central America</td>
<td>09</td>
</tr>
<tr>
<td>Chile</td>
<td>13</td>
</tr>
<tr>
<td>Colombia</td>
<td>17</td>
</tr>
<tr>
<td>Ecuador</td>
<td>19</td>
</tr>
<tr>
<td>Mexico</td>
<td>21</td>
</tr>
<tr>
<td>Peru</td>
<td>24</td>
</tr>
<tr>
<td>Uruguay</td>
<td>26</td>
</tr>
<tr>
<td>Our renewable power experience in Latin America</td>
<td>28</td>
</tr>
<tr>
<td>Norton Rose Fulbright in Latin America</td>
<td>30</td>
</tr>
<tr>
<td>Contacts</td>
<td>31</td>
</tr>
</tbody>
</table>
Renewable energy in Latin America

Latin America is undergoing a transition to renewable energy. The annual Global Trends in Renewable Energy Investment report from 2015 found that worldwide investment in the renewable energy sector between 2004 and 2014 amounted to more than US$2 trillion. In 2014 alone, global investment in renewable power and fuels totalled US$270 billion, with more than half of this occurring in emerging markets and a significant proportion directed to Latin America. This investment is expected to continue as an increasing number of Latin American countries set renewable energy goals and offer financial incentives for project deployment and manufacturing. Furthermore, the demand for electricity will continue to increase rapidly due to the ongoing demographic and socio-economic structural changes in many Latin American countries.

Norton Rose Fulbright has offices in Venezuela, Colombia and Brazil. Our strong Latin America practice is one of the most recognised and successful of all the international law firms operating in the region.

We first established a presence in Latin America in 1997 by opening our office in Caracas, followed by offices in Bogotá in 2010 and Rio de Janeiro, where we practice English, Canadian and US law, in 2014. Norton Rose Fulbright has more than 80 legal professionals based in the region, who are entirely bilingual and multicultural in their legal training. We offer our clients extensive experience, as well as strength and depth of resources in a wide range of industries, including renewable energy and natural resources.

Simon Currie
Partner, Global head of energy
Tel +61 2 9330 8236
simon.currie@nortonrosefulbright.com
Renewable energy in Latin America

Top three contributors were Banco de Inversión y Comercio Exterior SA, Banco de la Nación Argentina and Industrias Metalúrgicas Pescarmona SA (IMPSA).

Potential

Argentina is ripe for exploitation of wind, solar and biomass with exceptional capacity in relation to wind energy. Global experience indicates that with average winds of 5m/s or higher it is feasible to deliver good returns in wind power generation. About 70 per cent of Argentina’s territory enjoys winds with an average speed of 6m/s or more, while in areas of Patagonia they can exceed 9m/s. Argentina has the foundation to become a regional leader in the use of this technology.

Argentina also has strong solar resources, especially in the north western regions. The western regions are reported to receive twice the amount of solar radiation as Germany, one of the world’s largest solar markets. Despite this, solar power has been largely untapped, with reports showing that there is only 10MW of installed capacity compared to the target of 3.3GW by 2020, which leaves significant development potential for the next following years.

Biomass and waste-to-energy in Argentina have long been overlooked. Argentina’s varied environmental ecosystems fuel the growth of diverse crops (including soy), which creates potential for biomass energy. Studies have shown much of the six million tonnes annual forestry waste in Argentina could be used to generate electricity. In 2013, the government created the ‘PROBIOMASA’ program, which aims to boost production, management and sustainable use of biomass for energy purposes. The PROBIOMASA program has targeted the generation of 400 thermal MW by 2016 and seeks to eventually convert 12 million metric tons of agriculture-related biomass annually. The PROBIOMASA program needs approximately US$750 million in funding, however government support for those projects was just over US$5 million.

Support regimes

In October 2015, Argentina issued Law No. 27,191, an amendment to Law No. 26,190 that establishes the national regime for the promotion of renewable sources of energy for power production. New projects or repowered existing plants benefit from an anticipated VAT return for capital goods purchased, accelerated amortization of the income tax, tax certificates for projects with national components and extension to ten years of the period for tax carry-forwards. In addition, the government will fix an energy purchase price, calculated on a project-to-project basis, to guarantee a fair return on investment.

The opportunity

The Argentinian energy landscape is still by and large dependent on fossil fuels, which represent 87 per cent of the total energy mix. Whereas until 2010 Argentina was an energy exporting country, increased consumption combined with a steady decline in the extraction of hydrocarbons has forced it to import oil and gas from neighbouring countries. The high costs of imports are a main driver for the development of renewable energy.

Law No. 26,190 identifies the development of electricity generation from renewable energy sources as an area of public interest and commits the state to increasing the share of renewable energies (including mini hydro under 30MW capacity) to eight per cent of the national electricity mix by the end of 2016. The Argentine parliament’s lower chamber recently approved a new renewables law that intends to stimulate investments by providing for a fund supporting the financing of renewable energy projects, which is considered the main obstacle for the local sector. It also intends to achieve eight per cent of renewable energy in 2017. In the longer term to 2025, Argentina will seek to boost renewable energy to 20 per cent, or 36TWh.

Argentinian organizations have played an important role in financing renewable projects, given perceived risks for foreign investors. Commercial banks, funds and private equity firms have also participated in the market so far. The
Renewable energy in Latin America

Law No. 26,191 also provides for the creation of the Trust for the Development of Renewable Energies, mainly financed by the National Treasure. This fund will provide a subsidy of US$0.11/kWh to photovoltaic (PV) producers and US$0.005/kWh for facilities up to 30MW generating electricity from wind, geothermal, biomass, biogas and hydro sources. However, to date, this fund has not been set up and the FIT is unavailable.

In addition, the new renewables law recently approved by the parliament’s lower chamber establishes that the government will channel at least 50 per cent of savings from offset fossil fuel to the Fund For Renewable Energy, along with charges on power consumption, interests and profits from financed projects.

In 2009, the government created the ‘GENREN’ program, through which ENARSA (a largely state-owned company) could buy electricity from private enterprises generating renewable energy. Contracts are for a period of 15 years with a fixed price in US$ which is payable in ARS pesos at current exchange rates. In June 2010, the first tender was held which received offers for a total of 1,437MW which exceeded the government expectation by more than 40 per cent. A total of 895MW was awarded to 13 different companies. However, today less than ten per cent of these projects are actually operational. The second tender round is closed for those who presented at the first round and has been put on hold because the GENREN 1 projects have not been completed.

Obstacles/challenges

Since the default of the government in 2001, Argentina has found it difficult to attract investment. However, China has emerged as a willing financer with the China Development Bank as an active player in renewable energy projects in Argentina. Whilst Chinese banks offer competitive interest rates and willingness to finance projects in Argentina, the money also comes with conditions, such as the use of Chinese equipment and contractors.

According to the Argentine Chamber of Renewable Energy, one of the principle obstacles for profitable exploitation of renewable energy sources remains assured power prices over a suitable duration of the project and effective enforcement of tariffs awarded under the GENREN PPAs. The reliability of contracts remains doubtful and creates uncertainty for wind farms which have high upfront costs. This might be resolved if the bankability of PPAs is improved, for example through a government fund that would be used to guarantee payments (due from the Offtaker) under the contract.

The lack of full implementation of Law No. 26,190 and delays in the GENREN program are also a challenge – as envisaged the law has the potential to jump start project development through a stable FIT regime under the aegis of the Trust for the Development of Renewable Energies and PPAs under the GENREN scheme. However, the amendments made under Law No. 26,191 bring additional incentives to the sector and may trigger much needed jump start to accomplish the goals set by these laws.

The future

In spite of attractive renewable resources and year-on-year growth in all primary renewable generation technologies, Argentina faces strong headwinds in making progress on renewable energy investments due to the national policy risk perceived by international investors and macroeconomic turmoil. The country’s relatively high cost of debt, and low availability of local and foreign capital, make it difficult for project developers to secure financing. Further, future tenders under the GENREN program will receive active participation only if the first round of projects progress satisfactorily. It remains to be seen if active steps are taken by President Macri’s new government to ameliorate these perceptions sufficiently.
Renewable energy in Latin America

**Brazil**

Energy generation by type in Brazil

<table>
<thead>
<tr>
<th>Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal</td>
<td>4%</td>
</tr>
<tr>
<td>Oil</td>
<td>12%</td>
</tr>
<tr>
<td>Gas</td>
<td>68%</td>
</tr>
<tr>
<td>Biofuels</td>
<td>3%</td>
</tr>
<tr>
<td>Waste</td>
<td>3%</td>
</tr>
<tr>
<td>Nuclear</td>
<td>7%</td>
</tr>
<tr>
<td>Hydro</td>
<td>3%</td>
</tr>
<tr>
<td>Geothermal</td>
<td>7%</td>
</tr>
<tr>
<td>Solar PV</td>
<td>12%</td>
</tr>
<tr>
<td>Solar Thermal</td>
<td>5%</td>
</tr>
<tr>
<td>Wind</td>
<td>5%</td>
</tr>
<tr>
<td>Tide</td>
<td>3%</td>
</tr>
<tr>
<td>Other sources</td>
<td>3%</td>
</tr>
</tbody>
</table>


The opportunity

Brazil has a well-developed hydro and renewables sector that represent more than 39 per cent of the overall internal energy supply, and more than 78 per cent of the installed capacity. Nonetheless, there is unexploited potential in sectors such as wind, solar and floating solar PV. Indeed, Brazil is considered a very attractive market for low-carbon investments. The Bloomberg Climatescope report placed Brazil as the second most attractive market in the world and the EY Renewable Energy Country Attractiveness index ranked Brazil ninth out of 40 countries (best ranked in Latin America). The rising demand for energy is a key driver for development of renewable energy in the country.

Although there are no legislative targets for increasing alternative energy use, Brazil has recently committed to expand non-hydro renewables to 20 per cent of electricity supply by 2030. In 2013 the country launched the Ten Year for the Expansion of Energy 2023 where it set a target of increasing total installed capacity from 126GW to 195GW. The focus of this 71GW expansion is on hydro power (32GW) followed by wind (20GW), biomass (4GW), solar (3.5GW) and small hydro (2GW).

Between 2008 and 2012 new investment in renewable energy varied between US$7.2 billion and US$12.1 billion, falling to US$3.9 billion in 2013. The 2013 downward trend was caused by worries about policy support, reductions in technology costs, as well as a delay between auction rounds. In 2014 Brazil climbed back into the top ten countries for investment in renewables, and was the second of the developing economies. In 2014 approximately US$7.4 billion was invested in renewables – double the 2013 total. Wind attracted 84 per cent of the investment (US$6.2 billion), 117 per cent more than in 2013. A notable driver of renewable energy investment in Brazil is the government’s online three stage reverse auction process where new power projects are introduced for private development three (A-3) to five years (A-5) in advance of delivery dates for the lowest possible cost.

Potential

The wind sector attracts most investor attention with an estimated current potential of an incredible 300GW. The wind power generation capacity grew 891 per cent between 2009 and 2014 and attracted 84 per cent of the investments destined for renewable energy in 2014. 2015 ended with 281 plants in operation with an installed capacity of approximately 7.1GW. Compared other BRIC countries India (20GW) and China (90GW), this leaves Brazil with considerable room to grow and significant unutilised potential.

Solar power is an unexplored energy source in Brazil despite its tremendous potential, particularly in the north east region where the solar radiation is of between 5,700–6,100 kWh/m² per day on average. The annual average solar radiation for the country is 1,200–2,400 kWh/m²/year. This is higher than Germany which is a well-established solar player with an annual average solar radiation of 900–1,250 kWh/m²/year. Despite the high initial costs, solar micro and mini generators could be an effective solution for the difficulties faced in north and north east regions in terms of energy access.

The hydro sector is likely to continue to attract investment due to its 260GW potential of which 40 per cent is located in the Amazon region.

Support regimes

Law 12.187/2009 established the National Policy on Climate Change (NPCC). The NPCC establishes the expansion of renewable and clean energy usage as a part of the national strategy for medium-long term.

The Incentive Programme for Alternative Electric Energy Source – PROINFA is also highlighted in the national plan. It was created in 2002 to encourage the development of wind energy, biomass and small hydro, which has been successfully implemented, particularly for wind power which
Renewable energy in Latin America

increased its installed capacity from 22MW in 2002 to the current 7.1GW.

Biofuel is the energy source with maximum tax incentives for importers and producers, offering significant deductions in two tax categories: the Social Integration Program and the Contribution to the Social Security Fund.

In 2012 a new Electric Energy National Agency resolution (482/2012) came into force, to facilitate the connection of small renewable power generation plants to the distribution grid. The mini and micro generators can request the local distributor for grid connection.

The resolution also proposes the creation of an energy compensation system (net metering), whereby the owner of a small plant does not need to consume all the energy produced at the time of generation. Excess electricity can be fed into the grid giving the generator energy credit that can be used within 36 months.

One of the major challenges was transmission infrastructure, which created delays in grid connection for renewable energy developers. This was overcome through a new regulation. Developers who seek to build renewable energy projects firstly bid for the necessary interconnection to the mains and subsequently bid for the supply of power.

Obstacles/challenges

Unlike most other Latin American countries, Brazil has not yet implemented significant tax incentives for the development of the renewable energy sector, despite the provisions of the Ten Year Plan. The high costs of initial solar development is still rendering the energy source uncompetitive in Brazil in the absence of appropriate governmental incentives. This may well change.

The Brazilian Development Bank – BNDES – has a number of different financing programmes specifically aimed at renewable energy projects. It is the largest lender in Brazil for renewable energy financing across technologies. In 2014, Bloomberg’s New Energy Finances league tables for participants in utility-scale asset finance transactions in clean energy showed Brazil’s BNDES as the top lead arranger, with a credit of US$2.7 billion, up from US$1.5 billion in the preceding year. BNDES requires that at least 60 per cent of the equipment is locally produced in order to grant loans, which presents an additional barrier. However, there are signs that this requirement may be relaxed to approximately 20 per cent, which should kick start lending in the solar sector.

The future

There are 108 wind projects currently under construction (which will add a further 2.7GW to the grid in the near future) and 350 projects contracted (expected to add 8.3GW). There are also 46 hydro projects under construction (expected to add 15.7GW) and further 175 contracted hydro projects (expected to add a further 2.2GW).

Due to initial high costs, renewables had been unsuccessfully competing with conventional energy projects for a few years. However, in August this year wind projects accounted for 80 per cent of the capacity in an A-3 tender in which 670MW have been contracted. Furthermore, also in August this year, the government held a solar only auction awarding 30 projects for the total generation of 834MW of power.

The government held a solar and wind energy auction in November this year, which had a total of 1,379 registered projects capable of adding 38,917MW to the grid. The government also announced that due to the success of the previous year solar energy auction, they plan to conduct solar energy auctions annually. In addition, due to the success of the last solar energy auction, the plan is to conduct solar energy auctions annually.

COP21

In relation to the Conference of the Parties to the United Nations Framework Convention on Climate Change (COP21), Brazil carried out a series of public consultations with different representatives of the civil society and environmental organisations. Among the government goals are the elimination of deforestation in the Amazon forest, the creation of strategies for a massive reforestation within the country and the establishing of means for monitoring all Brazilian biomass.
Central America is rich in renewable energy resources and there exists tremendous opportunity to harness this potential. The region has a total installed generation capacity of 12GW. Guatemala and Costa Rica have the largest capacity, with approximately 3GW each, followed by Honduras and Panama, with just over 2GW each, and El Salvador and Nicaragua, with 1GW each. As a whole, Central American countries generated 43TWh in 2011.

Historically, Central America has been powered mostly by hydropower, but in the mid-1990s hydropower’s share dropped as it began to be replaced by fossil fuels. In the mid-2000s, increasing shares of renewables, such as wind in Costa Rica, Honduras, and Nicaragua, decreased the region’s dependence on oil. Encouragingly, despite the range of fossil fuel options now available, the region is continuing to expand its use of renewable energy, a trend that is in the global interest as well as the economic, social, and environmental interest of Central American countries.

The opportunity

Today, the electricity matrix of the Central American region is divided mostly between hydropower (30 per cent large hydro, plus 12 per cent small hydro) and oil and diesel (38 per cent). However, concerns about dependence on oil, the environment and energy security have forced the region to develop other renewable resources.

Central America has the largest share of renewables (56 per cent) and the most diverse mixture of renewable generation, composed of biomass, geothermal, wind, and hydro. Costa Rica, El Salvador, Honduras, and Nicaragua have developed some geothermal resources. Costa Rica, Honduras, and Nicaragua have about 350MW in wind farms, and Panama has 158MW of wind energy in the pipeline.

Potential

The falling prices of renewables, their abundance in the region, and fit with a hydro-dependent electricity matrix indicates that the development of renewable energy is an attractive option for meeting growing regional energy demand and for providing energy security at a competitive cost.

Moreover, the declining costs of wind and solar equipment have made those technologies cost competitive in several markets in the region; this is especially true of those countries which depend on imported fossil fuels for power or have high electricity tariffs, like Nicaragua and Honduras.

In view of the increasingly favourable policies, incentives, and political support that have been introduced in the last five years, Central America has the potential to meet 100 per cent of its electricity needs with renewable energy.

The region’s estimated geothermal power potential is more than 20 times the current installed capacity, and geothermal power alone could satisfy nearly twice the region’s predicted electricity demand through 2020.

Existing regional wind power installations currently use less than one per cent of the available resource potential, even according to conservative estimates, and most Central American countries boast two to three times the annual solar radiation of world solar energy leaders such as Germany and Italy.
Renewable energy in Latin America

Geothermal
Most of the geothermal potential in Central America has not been exploited. Studies vary widely in estimates of regional geothermal resources and range from 2,700–13,000MW across about 50 different sites.

Wind
In Central America, wind has been harnessed to produce energy at utility scale. The total installed capacity of wind power in the region reached 2988MW in 2011 and slightly more than 38 per cent of the wind power capacity was installed in 2010 alone. In 2011 Central America produced 738GW/h of electricity from wind, representing 1.7 per cent of generation in the region.

However, these trends do not reflect the entire region. Only three Central American countries (Costa Rica, Honduras and Nicaragua) currently have large-scale wind farms.

The regional interest in wind energy is expanding rapidly. The three countries mentioned above are currently installing and operating new plants. Panama, an ambitious newcomer, has licensed more than 950MW of wind capacity, which amount to a staggering 39 per cent of the installed generation capacity in 2012.

Solar
Solar energy in the region is in early stages, especially when it comes to market development. The first mid-scale photovoltaic power plant (by regional standards) is in Costa Rica, which has a 1MW plant that began operations in November 2012. In turn, a solar power plant of 1.2MW was installed in Nicaragua in February 2013. Each facility will produce enough energy to provide electricity to over 1,000 households.

Support regimes
Central American governments are aware of the importance of renewable energy as a means to reduce their dependence on large hydropower and imported fossil fuels, as well as to meet the region’s growing energy demand and provide energy access to currently underserved communities.

Countries in the region have issued ambitious policy statements that show a political will for the further advancement of renewables. There are a variety of regulatory measures in place to ensure that renewable energy continues to grow. For example, five of the seven Central American countries have established tendering procedures and three have adopted clean energy policies.

All countries except Nicaragua have adopted a biofuel mandate and Guatemala and Nicaragua have begun to experiment with feed-in tariffs. Most countries in the region have concrete policy mechanisms in place for advancing renewables. Tax incentives (to reduce costs, stimulate investment and increase the competitive advantage of renewable energy sources) are the most common, but the region also has positive experience in tendering for renewable energy projects.

Newer mechanisms, such as net metering, feed-in tariffs, and renewable energy production laws are just getting off the ground in Costa Rica, Guatemala, and Panama.

Governmental structure
The structure of Central American energy institutions has changed dramatically since reforms in the 1990s created new independent regulatory agencies, unbundled and privatised large state-owned utilities, and established competitive electricity markets in most countries (with the exception of Costa Rica and Honduras). Although new agencies initially faced obstacles connected with their lack of maturity, countries have developed stronger, more independent institutions over the years.

Transmission
The Central American Electrical Interconnection System (SIEPAC) is the regional grid system, with 1,800 kilometres of transmission lines that connect 35 million electricity consumers from Guatemala to Panama.

The current SIEPAC phase cost an estimated US$494 million, and a second stage of development, which will require up to US$157 million in investment, is expected to double the system’s overall capacity from 300MW to 600MW. Official estimates are for the expansion to be completed by the end of 2015, although most experts in the region say that this timeline is unlikely.

Central America’s Regional Electricity Market (MER) was established as a supranational electricity trade regulator with its own set of rules for regional power transactions over SIEPAC lines.

---

1 Feed-in tariffs (FITs) and net metering are both methods designed to accelerate investments in renewable energy technologies by allowing energy producers to be compensated for the energy they feed back into the grid.
Current efforts to strengthen electricity integration in Central America through SIEPAC and to streamline regional electricity regulation through the MER can benefit from international best practices for scaling up renewable energy through regional interconnection.

**Obstacles/challenges**

The region's dependence on hydropower has led to concerns about energy security, especially given recent, extremely dry weather that has resulted in electricity shortages. In response, the Central American countries commissioned the creation of a regional grid (SIEPAC) that would enable international power exchanges. They also established a regional electricity market and a regulatory commission. To reinforce this interconnection and to enable access to North American and South American markets, a Mexico-Guatemala interconnection was completed and a Colombia-Panama interconnection is under construction.

The biggest challenge facing SIEPAC has been the creation of a regulatory framework for trade, given the region's different power market structures. Central America experienced a wave of market liberalisation reforms in the 1990s, during which El Salvador, Guatemala, Nicaragua, and Panama liberalised their entire electricity markets, unbundled their vertically integrated utilities, and opened areas of generation, transmission, and distribution to private competition. Honduras and Costa Rica preserved their vertically integrated utilities, which are state-owned and operate as a single buyer. In both countries, additional generation is purchased from Independent Power Producers (IPPs).

Infrastructure challenges can present major concerns for developing any energy project in Central America, renewable or otherwise. Whether these challenges are perceived or real, they are often cited as particularly concerning for renewable energy deployment, increasing the risks and costs associated with renewable investments and, in extreme cases, preventing a prospective project from being developed. The distribution of renewables often means that existing grid networks must be extended to account for new factors, such as suitable project siting in resource-rich zones, and the need to manage intermittent generation.

**Obtaining finance**

The investment climate for renewables is influenced heavily by a country’s overall financial reality. Across the region, the capacity of countries to finance new projects with local and international funds varies widely. Panama, for example, has both a very healthy internal savings rate and a high level of foreign direct investment (FDI), whereas El Salvador has the weakest performance in both areas. This is consistent with the performance of investments in the power sectors of these countries. Nicaragua has negative internal savings, but a very high rate of FDI, while Guatemala and Honduras have modest but positive rates in both areas.

The major obstacle to integrating sustainability policies into the operations of financial institutions remains the lack of understanding of the risks and opportunities of renewable energy and a failure to address these with the right financial products.

Having said that, the ability and willingness of commercial banks to fund renewable energy projects has increased significantly in recent years. The Central American Bank for Economic Integration (BCIE) and BAC-San José (a private bank) signed a technical cooperation agreement within the framework of BCIE’s Green Initiative to create a green credit product to support renewable energy and energy efficiency investments. Loans cover up to 90 per cent of project costs, with costs for audits built in, as well as an associated partial loan guarantee programme for energy equipment which can enable larger-scale project financing.

In the past decade, Central America has improved development policies and regulatory frameworks to promote renewable energy, despite challenges in some countries in relation to the overall investment climate.

**Community resistance**

Potential social barriers to renewable energy development can be summarised as a lack of awareness of the opportunities for their deployment by the wider public and/or key stakeholders. Three prominent examples are general scepticism towards the feasibility and/or the economics of renewable energy, vested interests in the status quo, and not-in-my-backyard (NIMBY) resistance at the project development level.
Renewable energy development is essential to address the region’s key energy challenges, by providing universal access to energy, meeting future demand, transforming the electricity system, and mitigating the effects of climate change.

We can see that increasing policy support, such as the use of energy auctions, has already led to growth in renewable energy capacity in Costa Rica, Guatemala and Panama.

A further development may be solar energy: although wind and small hydropower have received the largest share of investments to date, solar energy is poised for growth in Central America. There are enormous opportunities for future renewable energy development in the region, and domestic and international investors will be increasingly willing to harvest these opportunities if the remaining technical, market, finance, and social barriers can be removed. However, to achieve their full clean energy potential, Central American countries will have to assess and document their renewables endowment, communicate broadly the potential of these assets, and create the necessary financial and political mechanisms for supporting them.

The future
Renewable energy in Latin America

Chile

Energy generation by type in Chile

- Coal: 1%
- Oil: <1%
- Gas: 41%
- Biofuels: 8%
- Waste: 27%
- Nuclear: 8%
- Hydro: 15%
- Geothermal: 8%
- Solar PV: <1%
- Solar Thermal: 1%
- Wind: 15%
- Tide: 8%
- Other sources: 1%

2013 Energy Production in GWh.

The opportunity

The Chilean renewables market has been the focus of much interest in recent years as the industry reacts to the potential for growth. In August 2014, the government awarded 76 concessions to more than 30 companies for development of 3.1GW of wind and solar energy projects. Latest figures released by the Centre for Renewable Energy in Chile in September 2015 have exceeded all expectations, with an encouraging pipeline of 50 renewable energy projects, corresponding to 2,394MW, declared under construction and planned to become operational between September 2015 and August 2017. As of August 2015, there were 69 renewable energy projects undergoing environmental evaluation by the environment authority with a total capacity of 6,015MW.

Renewable power is likely to continue to develop and to take a more prominent role in the energy profile in Chile. In August 2014 the installed renewable energy capacity represented 8.7 per cent of the total electrical capacity of the distribution system in Chile, whereas as of August 2015 this figure has increased to 11.27 per cent. Its growth will be sustained by a new renewable generation target of 20 per cent by 2025. Chile’s rising attractiveness for renewables investment cannot be better illustrated than by its fast rise in the EY Renewable Energy Country Attractiveness Index, ranked in ninth position as of September 2015, up from thirty-third position in the February 2013 index. Business Monitor International’s latest Power Risk/Reward ratings rank Chile as the number two power market in Latin America, immediately after Mexico.

International players such as GDF Suez, BP (Pan American Energy), SunEdison, ENEL, Pacific Hydro, Actis, RP Global and Mainstream Renewable Power are already active in the market, with new projects making headline news on a regular basis. The market is attracting ever larger foreign investments. In 2013, private equity firm Actis and Mainstream Renewable Power established a JV to develop 600MW of wind and solar projects at an estimated cost of US$1.4 billion. The project has been cleared by the Chilean Environmental Evaluation Service and construction is expected to commence in the coming months. The government has also approved five solar plants totalling 300MW to be developed by China’s Sky Solar at a cost of US$1.1 billion and the project is expected to get underway in the third quarter of 2015. Finally, Enel Green Power has started the construction phase of the Finis Terrae solar photovoltaic power project – the largest photovoltaic installation in the country. Once fully operational, the plant will be able to generate more than 400GWh per year, equivalent to the annual electricity needs of nearly 198,000 Chilean households.

At national level, non-regulated consumers such as mining companies are also realising the potential for renewables in Chile, and these consumers are contributing to their development by entering into agreements to purchase green electricity directly from generators. The rise of renewables in Chile is good news for both environmentalists and the mining industry, as Chile is fighting an ever-present risk of power shortages.

Key drivers

Power shortages and high electricity prices

Although rich in other natural resources, Chile has no gas, oil or coal and relies heavily on imports for its energy supply. Domestic resources are limited to large hydropower, which has to date played an important role. However, after a few years of droughts, and unreliable gas imports since 2004, energy supply and energy security are two of the key issues facing the country.

Scarcity of energy supply is compounded by the fact that the Chilean economy is buoyant, growing at an average rate of more than five per cent between 1987 and 2015. This is set to continue, with GDP growth predicted to increase at a rate
Renewable energy in Latin America

of approximately 4.5 per cent until 2023. Northern Chile is growing even faster due to the expansion of its mining industry. Chile’s energy requirement is forecast to grow in parallel at a rate of six to seven per cent until 2020.

These factors combined mean that the electricity price in Chile has traditionally been high in comparison to many other countries in the region. Recently, power traded on the spot market at US$80.9/MWh. Such high power prices mean that renewables projects can be competitive despite relatively low government support and without a price guarantee.

Limitations of hydro
Due to strong public opposition, in 2014 the government cancelled its plans to develop a large hydropower project – HydroAysen – in Patagonia, South Chile. The project, which consisted of five large dams, would have flooded 5900Ha of land, thus posing a serious threat to Chilean wildlife. Power transmission would also have been an issue, as the project would be remote from the main source of demand in Central Chile and so would have required substantial investments in the transmission system. Environmental concerns coupled with droughts in recent years have also highlighted the limitations of relying on hydropower and have led the Chilean government to announce its intention to limit its dependence on hydroelectricity.

No more coal?
With thermal coal prices across the Pacific basin at low levels, and new coal-fired generation load factors increasing markedly in markets like Europe, you would expect that the solution to Chile’s energy needs lies in additional coal-fired plants. However, there is strong environmental and political opposition to additional coal capacity, especially in the North. In August 2013, a Chilean appeals court blocked the construction of Endesa’s US$1.4 billion coal-fired thermoelectric project. In September 2014, Chile enacted a carbon tax which imposes a levy of US$5 on each metric ton of carbon dioxide emitted by thermal power plants with a generation capacity of at least 50MW. This measure reflects a commitment to Chile’s target of cutting greenhouse gas emissions by 20 per cent from 2007 levels by 2020. Taken together, this means that significant levels of new coal capacity will not come online any time soon.

Potential
The potential of the Atacama Desert and the mining industry
The North of Chile is the home of the Atacama Desert, which has one of the highest rates of solar radiation in the world. The potential for the development of solar technologies in the North is vast. Half of the Chilean renewables pipeline is in solar PV.

The North is also where most of the Chilean mining industry (and a third of the world’s copper mining) is located. The industry requires a continuous power supply yet there is limited power in the North and the development of new coal-fired power stations to match increased demand is slow. Grid access and reliability of power supply are also problematic.

By contrast, solar projects can be developed quickly and in close proximity to the mining sites, thus limiting grid access issues and risk of grid constraints. Of course, they also bring benefits in terms of corporate responsibility. Moreover, solar power can be produced at a competitive price in a country where power prices are traditionally high, particularly by eliminating the risk and costs associated with bringing fuel supplies to remote mining sites.

Mining companies are therefore supporting renewables development by entering into long term power purchase agreements with developers. In a recent report, EY estimated that mines in Latin America will invest more than US$1 billion in renewable energy projects by 2022, up from US$37 million in 2013.

For renewables developers, the commitment of mining companies to their project means they can secure better financing, since revenues for the project are put in place for a fixed period. However, it can be challenging to get mining companies to commit to long term offtake contracts. This has been an issue globally, as the cyclical nature of the mining industry is not easily reconcilable with the long term contracts required to underpin investments in the power sector.

There remains an issue with intermittency of renewables generation that can be difficult to manage for end-users. Concentrated Solar Power (CSP) projects with storage capability are touted as a possible solution, but the levelised costs of energy from CSP remain stubbornly high. Our view is that CSP is not going to be a game changer in Chile in the short to medium term.

Surfing the waves
A renewable resource not prepared to be thrown into the shade by solar is ocean energy. With its long coastline, powerful waves and tidal currents, Chile has 160GW of potential capacity available through marine energy resources, according to its government’s assessment. This is more than ten times the current installed capacity in the country and could supply power to more than 112 million homes. The government announced in October 2013 that it will invite bids from developers for US$14 million of grants to build the country’s first wave and tidal projects. The winners will be required to match the investment in the pilot projects, with an additional US$2.4 million available from the Inter-American Development Bank. The Chilean
government also pioneered the creation of the national Marine Energy Centre, which was the first to be established in Latin America.

Merchant power and bankability

High power prices, a liquid spot market and attractive longer-term pricing forecasts for power have meant that a few renewable projects, including the Negrete wind project, have been financed on a merchant basis. One of the most impressive of these projects is the 50.7MW San Andrés solar farm, which will be built by SunEdison Inc. This project will be one of the largest merchant power projects in the world, with spot prices competing on the open market. It has received financing from the US government’s Overseas Private Investment Corporation and the World Bank Group. Another recently completed project, the 70MW PV Salvador Solar Plant, is expected to produce approximately 200GWh of solar electricity per year, enough to supply electricity to approximately 70,000 households in Chile.

Such projects represent a welcome solution for developers who sometimes struggle to negotiate long term power purchase agreements at a reasonable rate. For these projects, the merchant risk is arguably limited, because plants in Chile are dispatched in order of their cost of generation to ensure that electricity is supplied at the lowest available cost. This system favours renewables with no fuel costs, such as wind and solar, which means that developers and financiers face little risk.

Favourable climate for investors

According to Transparency International’s 2014 Corruption Perceptions Index, Chile, ranked at 21st place, is perceived to be one of the least corrupt countries in Latin America and is the third least corrupt in the Americas, after Canada and the US. On the 2013 Index, it ranks 22nd out of 177 countries. Chile has for a long time also been one of the most attractive countries for doing business in Latin America and is well-known for its openness to trade, capital flows, exchange of technology and ideas, labour movements and cultural integration. This favourable reputation has led it to be ranked ahead of the US, Mexico and Brazil in the EY Globalization Index (2012).

Support regimes

The five per cent obligation on generators to incorporate renewables in their energy mix has been replaced by a 20 per cent target. This landmark agreement puts an end to several years of government hesitation where ambitious targets were proposed before being abandoned for being ‘neither technically nor economically’ feasible.

Under the current support regime, parties who are subject to the renewables obligation can comply by collecting green certificates, either issued to them or purchased from the market. The obligation only applies to contracts for the withdrawal of electricity from the transmission system that were entered into, extended or renewed after August 31, 2007. It also only applies to renewable electricity generated by installations that first connected to the system after January 1, 2007. As a result the market is still immature and with a limited range of buyers. However, there is a market and green certificates are traded at a reasonable discount to the value of the fine for non-compliance. For wind projects, green certificates can represent up to 15–20 per cent of project revenues.

The 2013 Budget Law allocated a budget of US$85.5 million to the ‘Support for Non-Conventional Renewable Energy Development Programme’ which subsidises pilot projects based on non-conventional renewable energy. Several public tenders have been launched under this fund, one of which is the CSP plants tender which was launched at the end of February 2013. Chile’s Ministry of Energy agreed to provide a subsidy of up to US$20 million and to facilitate access to land for the plant. The government also announced that it had negotiated a consortium finance sources which amounted to over US$350 million in soft loans. The tender was recently won by the Spanish company Abengoa. In 2014 the company began construction of the Atacama 1, one of the largest solar complexes in Latin America. The power plant, located in the Atacama Desert, will have an installed capacity of 210MW and will be the first solar-thermal plant for direct electricity production in South America.

In addition, with many projects approved but not yet built, the Centre for Renewable Energy in Chile (CER) has announced several funding programs to help get more projects grid-connected, with particular emphasis on projects of 50MW or less. These plans include US$2.3 million in funding to develop and finance grid-connected projects in the coming year, plus another US$4.1 million for self-supplying renewable energy systems. CER is also allocating US$1.8 million to back engineering studies for projects in the pre-investment stage and a further US$4.3 million for smaller projects to develop renewable energy systems for self-consumption (for instance, the nation’s dairy sector, which is seeking to develop more biogas options).
Obstacles/challenges

Blackouts
Earthquakes severely affect energy security in Chile. The majority of Chile’s electricity grid was severely affected by the earthquake that shook Chile in February 2010. This, coupled with a lack of investment, is blamed for blackouts and other constraints that still affect Chile. There are concerns that the grid is ill-equipped to accommodate intermittent renewables generation. Further investment in the system will be required if Chile is to add targeted 8000MW of new capacity (renewables and conventional) by 2020. In April 2015, President Bachelet confirmed the government’s commitment to its energy plan for the unification of Chile’s two electricity grids, the SIC (which serves Santiago and the central region) and the SING (which supplies the northern region), by signing an official decree. This would mean overcoming the 600km stretch of desert which currently divides these grids. President Bachelet has also promised to open up the grid to further competition, which, she argues, should lead to a reduction of the SEC’s marginal costs by 30 per cent in the next four years.

Alternatives to merchant power
Developing projects on a merchant basis is not going to be attractive to all investors and the market needs to develop so that wind and solar power can be sold on a long term basis to distribution companies and wholesale customers. This may require solutions such as development of aggregators, which are able to manage a larger portfolio of renewable assets, and structuring power purchase agreements in such a way that ‘blocks’ of power are sold (for example, by combining intermittent renewables with hydro and other storage options).

Corporation tax increase
A new tax bill was passed by the Chilean Congress in September 2014. This bill proposes to overhaul the current tax system by effectively increasing corporate income tax from 20 per cent to 25 or 27 per cent in the period 2014–2017. The reform is expected to increase the cost of doing business in Chile.

The future
With the increased demand for power from the mining industry and the country’s unparalleled natural resources for renewables generation, such as wind, solar or geothermal, the Chilean renewables market has great potential and should continue to attract the interest of international investors. High power prices and the structure of the power market both contribute to making the financing of a renewable project on a merchant basis a real possibility. The support of the mining industry, through direct power purchasing from green projects, will also greatly assist the bankability of renewable projects.
Renewable energy in Latin America

The opportunity

Colombia has a rich endowment of energy sources and the country is heavily reliant on installed hydropower (65 per cent of annual consumption), which provides cost effective electricity. However, Colombia has strong potential for non-conventional sources of energy generation, particularly solar, wind and biomass. According to the UN Industrial Development Organization and the International Centre on Small Hydro Power, in 2010 Colombia saw its highest growth for renewable energy generation, totalling 2,543MW of added capacity. It is estimated that large scale onshore wind and large scale geothermal would be able to achieve the same cost/KW as that of current hydroelectric generation.

Colombia’s electricity and energy sector is under the jurisdiction of the Ministry of Mines and Energy (MME). The MME has adopted an Indicative Action Plan and established a target of achieving 3.5 per cent of on-grid and 20 per cent of off-grid generation from renewable sources by 2015. This is to be increased to 6.5 per cent and 30 per cent respectively in 2020. However, there are no legislative targets associated with the accomplishment of these goals.

Potential

In terms of wind energy potential, different studies agree that the use of this resource alone would be sufficient to meet the country’s current energy needs. The department of La Guajira stands out for its high natural resources in this area (estimated at 21GW of capacity). Winds in La Guajira have been classified as Class 7 (close to ten metres per second annual average), making it one of only two regions in Latin America to winds of this speed. The Jepirachi wind farm, the first operational wind farm in the country, is located in this area. There is also potential for large scale solar generation in the Orinoco and San Andrés areas in the northern part of the country.

Biomass energy also has a positive outlook due to the large quantities of agricultural and forestry waste produced in the country. Important sources of agricultural waste are from banana plantations, rice, coffee, and livestock. The most suitable places for generating this form of energy are the departments of Santander and Norte de Santander, Valle del Cauca, Llanos Orientales, and the Caribbean coast. There are some existing biomass projects, such as the Ingenio Mayagüez cogeneration plant, which became operational in 2011.

With regard to small-scale hydropower, there is an estimated 25GW of naturally occurring potential for electricity generation, mainly in the Andean region. However, concerns about the environmental impact of hydropower, and the fact that large-scale hydroelectric plants are already located in the best places, are likely to put a halt on further developments in this sector.

Support regimes

Law 1665 of 2013 (the New Renewable Energy Law (REL)) was adopted in April 2014. The REL approved the International Renewable Energy Agency Statute as an attempt to promote the adoption and sustainable use of all forms of renewable energy, including bioenergy, geothermal, hydropower, ocean, solar, and wind energy, in the pursuit of sustainable development, energy access, energy security and low-carbon economic growth.

The Financial Support Fund for Energy Provision in Non-Interconnected Zones (FAER) was created in 2000 by Law 633 of 2000. This fund has proven to be an important tool for the financing of projects in areas not connected to the national grid. The fund focuses on energy expansion using both renewable and non-renewable energy sources, and
Renewable energy in Latin America

has become an important instrument for financing projects in these regions. Another significant aspect of Law 633 is the creation of the Fund for Non-Conventional Energies (FENOGE), which will help to finance initiatives in non-conventional energy with public and international resources.

Investors in renewable energy projects can obtain a 50 per cent annual deduction of taxable income for the first five years following an investment. Equipment and machinery are excluded from VAT and, if such equipment and machinery is imported, customs duties are exempt.

Finally, the government has regulated the self-generation of energy through Decree 2469 of 2014. Legal or natural persons will be considered self-generators if the energy they produce is for their own consumption and if they do not use national transmission or distributions systems. However, if there are surpluses, self-generators can deliver energy to the national network in accordance with the regulation established by the Energy and Gas Regulation Commission (CREG). Large-scale self-generators must be represented in the wholesale electric market by a distribution agent, who will market the surplus to the National Network. In addition, large-scale self-generators have to enter into a backup contract with the network operator which sets out the fees and charges for the energy distribution services performed by the operator.

It is important to mention that all self-generators will be considered as large scale producers until the CREG establishes criteria to determine which self-generators will be deemed large scale.

Obstacles/challenges

Colombia’s abundant hydro resources, and the historic lack of recognition of the benefits of renewable energy generation, have limited the call for government incentives in sectors like wind, geothermal and solar. There is a widespread perception that additional hydro capacity is the best solution, with fossil fuel capacity laid by for dry years.

Wind and solar energy are not competitive when compared to other kinds of energy generation, due to their intermittent nature. Hydrocarbons, on the other hand, have the advantage of being easily transportable and relatively cheap. These characteristics still make hydrocarbons more attractive to consumers compared to wind and solar sources. It remains true that consumers tend to prefer the cheapest and most effective products.

In addition, there are very few companies with the financial and technical capabilities to assume the high initial costs of renewables projects. Moreover, uncertainty about the generation capacity and reliability of non-dispatchable energy increases the financial sector’s perception of risk. This constitutes an economic barrier to any project and to any potential economies of scale which could lower the price of non-conventional energy. Higher costs create disincentives for companies to replace conventional sources of energy with non-conventional ones.

Another economic obstacle is the lack of public funds for the development of viable projects. If the use of renewable energy sources is to be accelerated, new and innovative mechanisms for financing will need to be implemented by both the government and private sector.

The future

There are several interesting projects in the pipeline. One of them, the Jouktai Wind Farm in the Cabo de la Vela District of the La Guajira department, is currently under construction and will soon initiate operation. Developed by ISAGEN, an estimated initial capacity of 31.5MW is expected, requiring the investment of approximately US$60 million. In addition, pre-feasibility studies have been concluded for two large-scale thermal projects near the Municipality of Villamaría, both developed by ISAGEN. The projects are still at an early stage, but progress in field and power plant development is expected in the next two years. Finally, the Ipapure Wind Farm project, with an estimated initial capacity of 200MW, is currently undergoing preliminary studies in the La Guajira department.

According to the Energy Productivity and Economic Prosperity Index of 2015, Colombia is currently the second country in Latin America to consume more units of energy than number of points of GDP. In fact, Colombia produces €330,000 million of GDP for every exajoule consumed, reflecting the considerable growth in Colombia’s energy demand. Taking that into account, the Institute of Planning and Promotion of Energetic Solutions (IPSE) has subscribed to a memorandum of understanding with Kepco, an expert in the renewable energy field, to consult on the introduction of non-conventional energy sources into the Colombian grid. To accompany this initiative, the Unit of Mining and Energetic Planning (UPME) included in the National Energetic Plan for 2050 a goal to increase the contribution of non-conventional renewable energy sources (photovoltaic, wind and biomass power) to ten per cent of the country’s total installed capacity by 2028.
Renewable energy in Latin America

Ecuador

The opportunity

Ecuador’s Constitution of 2008 explicitly states that the government will promote the use of clean and alternative energy sources. This commitment sits alongside other pledges to promote energy efficiency, provide access to public services, preserve the environment and maintain food and water security, among others. In August 2015, the Ecuadorian government announced a US$7 billion program for the country’s energy transformation. Government officials stated that by the end of 2015, 93 per cent of the country’s electricity will be sourced from hydropower. The country is also investing in other forms of renewable energy, such as wind power through the 16.5MW wind farm in Villonaco and in solar energy projects in the Galapagos Islands.

Potential

The National Plan for Good Living 2013–2022 (PNBV-SENPLADES 2013-2017) sets a target of reaching 60 per cent of national capacity from renewable energy sources by 2017. Objective 11.1 of this National Plan lays special emphasis on hydropower and bioenergy. The Electrification Master Plan 2013–2022, approved by Resolution CONELEC 041/13, puts forward plans for 25 hydropower projects totalling 4.2GW of new capacity by 2022, as well as an additional 217MW of solar, wind and other non-conventional renewables. Previously, the National Plan for Good Living 2009–2013 had set out a target of six per cent of installed capacity being sourced from renewable energy (other than large hydro) by 2013.

Support regimes

The regulatory framework for electricity is the Electric Law of 2015, which explicitly states an objective of promoting renewable energy sources, including solid-waste biomass. This law establishes that the Ministry of Electricity and Renewable Energy (Ministerio de Electricidad y Energía Renovable – MEER) is the governmental entity in charge of the regulation and planning of the entire power sector of the country, and hence carries the responsibility of promoting renewable energy. The law sets out preferential regulations for renewable energy, which are still under development by the newly created electricity agency (ARCONEL) and are expected to be issued in the second half of 2015. Previously, the Electric Law of 1996 mandated the now disbanded National Electric Council (CONELEC) to promote renewable energy through special dispatch regulations.

From 2000–2015, Ecuador had a feed-in tariff system to support renewable electricity deployment. The feed-in tariff evolved over time in terms of duration, rates and technologies included. In 2013, Regulation CONELEC 001/13 removed solar PV from the feed-in tariff and set overall technology-specific capacity limits for wind, biomass and biogas, CSP, ocean energy and geothermal installations eligible for the tariff. In 2014, Resolution CONELEC 014/14 maintained the feed-in tariff only for biomass and biogas, with differentiated rates for the first time, and for hydropower smaller than 30MW.

Small-scale generators smaller than 1MW do not require a permit for operation (Decree 1581 of 1999). However, in order to benefit from the feed-in tariffs, they needed to be registered with the CONELEC. The procedures for registration of small projects were established in 2008 by Regulation CONELEC 009/08. In 2013, Regulation CONELEC 002/13 superseded the 2008 regulation, and introduced two payments: a registration guarantee of US$7,000 for projects smaller than 500kW and US$15,000 for projects larger than 500kW; and an execution guarantee of one per cent of the total project cost.
Transmission

Grid access was facilitated by the feed-in tariff regulations, which mandated preferential dispatch for renewables. In the 2004 and 2006 feed-in tariff regulations, preferential dispatch was mandated until renewable generation reached two per cent of the total electric system generation capacity, at which point new renewable energy generators would dispatch on an economic merit basis. In 2008, Regulation CONELEC 013/08 established preferential dispatch for renewable electricity, up to a maximum of six per cent of operative installed capacity. In 2012, Resolution CONELEC 102/12 exempted hydro, biomass and geothermal from the preferential dispatch limit.

When a project developer builds a transmission line to connect a renewable energy project to the grid, it can obtain compensations for its expenditure, the levels of which were established by the feed-in tariff regulations of 2002, 2004 and 2006 as an additional US$0.06 cents/kWh/Km, with a maximum cost of US$1.5 cents/kWh/Km. Since 2013 (Regulation CONELEC 001/13), connection to the grid requires the payment of a non-refundable fee (US$10,000 for projects larger than 1MW and US$5,000 for projects smaller than 1MW) to the transmission or distribution company for a connection feasibility study. Payment of the fee does not guarantee connection. Once a project is cleared for connection, a guarantee of 0.5 per cent of total investment is required, refundable when the project begins operation on the agreed timelines.

Incentives

Fiscal incentives were provided by the Electric Law of 1996, which provided import duty exemptions for solar, wind, geothermal and biomass equipment, as well as a five year income tax exemption for renewable energy developers. The 2015 Electric Law does not contain similar fiscal provisions. Since 2011 (CONELEC 004/11) renewable energy projects receiving the feed-in tariff must contribute an amount (per kWh generated) to social and community development projects (Estado del Buen Vivir). As of 2014 (CONELEC 014/14) the amount is as shown in the below table.

<table>
<thead>
<tr>
<th>Technology</th>
<th>Contribution required (US$/MWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biomass</td>
<td>23.8</td>
</tr>
<tr>
<td>Biogas</td>
<td>16.5</td>
</tr>
<tr>
<td>Hydropower (&lt;30MW)</td>
<td>18.9</td>
</tr>
<tr>
<td>Wind</td>
<td>23.9</td>
</tr>
<tr>
<td>Solar PV</td>
<td>118.0</td>
</tr>
<tr>
<td>CSP</td>
<td>87.4</td>
</tr>
<tr>
<td>Ocean</td>
<td>127.7</td>
</tr>
<tr>
<td>Geothermal</td>
<td>33.6</td>
</tr>
</tbody>
</table>

Obstacles/challenges

Subsidies for electricity and fuel are a major barriers to the promotion of energy efficiency programs and renewable energy use in the manufacturing, service, and residential sectors. Although subsidies and the total absorption of investments by the state may constitute a risk to the financial sustainability of long-term projects (due to the pressure exerted by these measures on the national economy), this risk can be mitigated with the appropriate security and investment protection measures. However, there may be other institutional barriers. There remains, for instance, the problem of coordinating efforts between various government and private institutions to reach all end users of energy.

The future

Renewable energy sources are expected to play a growing part in meeting future energy demands, and with the right government support will ideally one day end Ecuador’s dependence on imported fossil fuels.
The opportunity

It is a promising time for Mexican renewables. After the energy sector was monopolised by the state electricity company CFE, limiting private participation for more than 75 years, a much awaited constitutional reform law was approved in December 2013 which will liberalise the sector for private investment and transform the power sector into a competitive wholesale market. A comprehensive package of 21 secondary laws were then enacted in August 2014. Accordingly, overall investment in the sector rose in 2014 to US$2.4 billion, as reported by the US International Trade Administration.

The main instrument governing the renewable energy sector in Mexico is the Law for the Development of Renewable Energy and Energy Transition Financing (LAERFTE), enacted in 2008. Under this law, Mexico implemented the Estrategia Nacional de Energía 2013–2027, which establishes that 35 per cent of energy should derive from renewable sources by 2024 (i.e. wind, solar, mini hydro, biomass, geothermal and wave power, large hydroelectric plants and, more controversially, nuclear energy).

According to the Mexico Energy & Sustainability Review 2014, Mexico accounts for 1.6 per cent of the total worldwide greenhouse emissions. This makes it the thirteenth largest emitter worldwide. Mexico’s geography makes it vulnerable to certain effects of climate change, for example, droughts and decreasing precipitation rates. Facing this reality, the General Climate Change Law set a goal to reduce greenhouse gas emissions by 30 per cent by 2020 and 50 per cent by 2050. The US International Trade Administration ranks Mexico fifth on its list of top renewable energy export destinations for 2016, with opportunities projected in every subsector.

The government provides project finance for renewable projects through its development bank (Nacional Financiera), using financial resources contributed by IFI's (IDB, IFC – World Bank, German Development Bank etc). Local players, including financial institutions, utilities and corporations, put around US$915 million into Mexican clean energy assets in 2012.

Potential

Sun Belt

Mexico has rich solar resources and is located in the so-called Solar Belt. In the Baja California region, average solar irradiation is greater than 2,200 kWh/m² per year which, to put in perspective, is more than double the radiation in Germany. Across Mexico, daily radiation varies between 1,600–2,250 kWh/m² per year, which is comparable to some of the best locations in the world such as the MENA region and Chile. The first large (30MW) solar PV plant, Aura Solar I, started operations in 2013 in Baja California. In August 2015, the country’s solar energy association, ANES, announced its target of 3GW total installed capacity by 2025.

Geothermal revival

Mexico has traditionally been one of the largest geothermal markets in the world, yet little development has occurred over the past decade. Recently, interest in the sector has revived with the development of two new 50MW projects. Geothermal research centre CEMIE-Geo opened in 2014 with an operating budget of US$75 million over the next four years to promote exploration and projects within the private sector. Geothermal has the advantage of providing baseload power, unlike the intermittent nature of solar and wind, which makes it attractive for developers and investors. In July 2015, the Ministry of Energy awarded five geothermal concessions and 13 permits for exploration to CFE, who will study geothermal resources for 448MW capacity across three states.

Currently, there are no private owners of geothermal power plants and the only plants in operation are owned by the CFE. However, Deputy Planning Minister Leonardo Beltran stated in July 2015 that private investors will have the opportunity to develop some 5000MW of probable
geothermal resource in the country. The Energy Ministry expects an additional 217MW of geothermal power by 2018. This number is modest compared to the estimates for wind and solar, but reflects the greater time and resources needed for geothermal projects — a typical project takes about seven years to complete. The secondary law, which is solely focused on geothermal energy, will prove key to giving this energy source the necessary boost by addressing the high risks and costs associated with geothermal exploration.

Advancing wind energy
At the end of 2015, the national installed capacity of wind energy was 3,037MW. The Mexican Wind Energy Association, AMDEE, has targets to generate 12GW of power by 2020. Construction has mainly been focused in Oaxaca, considered to be one of the best wind resources in the world, but investment has slowed down due to a mixture of social conflict with communities and a saturation of projects. Nevertheless, Enel Green Power is currently constructing an additional wind farm in Oaxaca having completed its Sureste I – Phase II farm in March 2015, and Iberdrola continues to construct its 102MW La Ventosa plant. Gamesa finalised an agreement with Banco Santander in 2014 for the joint development of wind farms in Baja California, with a total installed capacity of up to 500MW. In 2016, there is expected to be 805MW of new wind capacity added to the grid, rising to a total installed capacity of 9,500MW by 2018.

According to AMDEE figures, investments in Mexican wind to date exceed US$6,000 million. This reflects the 37 wind farms of varying sizes now in operation in the country. Between 2016 and 2018, a further US$13,000 million of wind investment is expected.

Self-supply scheme
Mexico expects the largest chunk of new solar and wind capacity to be generated by businesses, which under the self-supply law allows companies to buy electricity directly from power plants. Walmart, for example, supplies its stores in Mexico from a 67MW wind farm in Oaxaca. In May 2014, a 252MW wind project was announced in the state of Nuevo Leon that will provide energy for a group of companies including FEMSA and cement giant Cemex.

Support regimes
Mexico has several schemes for development of renewable energy generation, including the small power producer, self-supply, co-generation and the IPP schemes. The aforementioned law reforms included the set-up of a clean energy certification scheme to serve as the primary mechanism for encouraging clean energy development.

This certification scheme sets a target for all suppliers and qualified users of the grid to source five per cent of all energy generation from renewable sources.

Tax incentives are established under Article 40 of the Law of Corporate Income Tax, among others, which provides for accelerated depreciation of 100 per cent for investments in equipment and machinery for electricity generation through renewable sources. The condition is that the equipment/machinery must remain in operation for at least five years following the tax deduction declaration. Further incentives include an exemption from import and export tax and a tax credit.

A funding mechanism was set up under the auspices of the Fund for the Energy Transition and Sustainable Electricity Use (LAERFTE). It invests in studies which further the objectives of LAERFTE. The fund is destined for research institutions and excludes private companies. It offers resources of US$538 million and is expected to be a fundamental player in helping Mexico reach its targets. Furthermore, the Mexican development bank, NAFINSA, is committed to supporting the government’s renewable energy ambitions – it financed 50 per cent of the capital for Aura Solar I, the first large scale PV plant in Mexico.

Regulations allow for the excess energy produced from renewable sources to be stored (banked) by CFE, so that it can be later used or sold to the CFE at a discounted cost.

Obstacles/challenges

Transmission
Reliable transmission and distribution infrastructure is essential for most intermittent electricity generation projects. Frequently, substations located in areas which offer a high concentration of resources, such as the Tehuantepec and Isthmus regions, do not have capacity to handle proposed projects or there are no transmission lines available to transport electricity to consumption centres. Historically, the CFE was the sole entity authorised to construct and operate energy transmission and distribution infrastructure. There were many complaints about the slow speed at which it upgraded and expanded the grid. The energy reform law now allows private sector participation in the development and construction of transmission lines, with CFE remaining as the grid planner. The private sector might well become a key driver for the development of the network.
Obtaining finance
As in other Latin American countries, obtaining finance remains a challenge. In particular, financial institutions are hesitant to provide funding to companies lacking AAA credit ratings. To meet the renewables target, smaller offtakers need to be able to access the self-supply scheme (and this is a trend which has been successful in the US to some extent). One solution is pooling several small offtakers; this was successfully tried by Next Energy, which brought together seven municipalities to build a 22.5MW wind farm in Monterrey.

Community resistance
There is significant resistance from local communities to allowing land acquisition for renewable energy projects or transmission lines. Last year, riots occurred in Oaxaca, where indigenous communities challenged the development of the Mareña Renovables Wind Farm on their lands, because they signed a contract based on incomplete information. As a result, the project has been frozen for over two years. The government still has some work to do in developing community R&R and information sharing.

The future
According to the Mexico Energy & Sustainability Review 2014, investments in the renewables sector have grown over 92 per cent in the last five years and installed renewable capacity is likely to grow ten per cent annually in the upcoming years. SENER expects renewable energy capacity to be driven primarily by wind power, which it states could account for 60.3 per cent of the national energy mix by 2025. The next largest contributors are expected to be small hydropower with 24.3 per cent and solar energy with a 12 per cent contribution.

Multinational developers and equipment suppliers have flocked to Mexico due to its opportunities and reliability. Several domestic companies have also penetrated this market with diversification into small-scale projects and equipment manufacturing. This is also reflective of trends in South Africa and India, where local manufacturing is evolving hand in hand with renewable energy project development.
Renewable energy in Latin America

Peru

Energy generation by type in Peru

- Coal
- Oil
- Gas
- Biofuels
- Waste
- Nuclear
- Hydro
- Geothermal
- Solar PV
- Solar Thermal
- Wind
- Tide
- Other sources

2013 Energy Production in GWh.

The opportunity

Peru's rising attractiveness for renewables investment is illustrated in the EY Renewable Energy Country Attractiveness Index. The country joined the index only very recently in May 2013, and by March 2015 was ranked 26th. It was also ranked 11th in the Climatescope 2014 Clean Energy Investment and Climate Financing league table, because of the impressive volume of financing received in 2013 in the small hydro and wind sectors. Several international players, including the IFC, BBVA, KfW, FMO, IDB and Corporación Andina de Fomento, have already entered the Peruvian renewables market, most notably through participation in hydropower projects.

According to the Ministry of Energy and Mines (MINEM), energy demand in Peru is projected to grow at ten per cent annually, propelled primarily by industrial growth. Accordingly, it is estimated that in 2017 total required energy capacity is expected to increase to almost 8GW, which would require significant investment in power generation. Depleting oil and gas resources are a major concern and have contributed to the growth of renewable energy investment.

The Law to Promote Investment in Electricity Generation with Renewable Resources (LRER) was approved in May 2008. It includes biomass, wind, geothermal, solar, tidal and hydropower in its ambit and promotes renewable energy as a national priority. The LRER also contained a non-binding target of up to five per cent of national electricity consumption to be met by renewable energy sources during the 2008–2013 period. This target was missed by a wide margin. Recently, the government has announced a renewable energy target of 60 per cent of national consumption to be met by renewable energy sources by 2025.

Potential

Peru is considered to have a ‘high’ potential for wind, solar, hydro and geothermal, a ‘high-medium’ potential for biomass, and an ‘unknown’ potential for ocean-based RETs. There is a significant gap between this potential and its realisation, and the 2014 statistics shown below illustrate that the country can do a lot more to harness alternative energy sources.

<table>
<thead>
<tr>
<th>Recourse</th>
<th>Total power potential (MW)</th>
<th>Installed capacity (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydroelectric</td>
<td>70,000</td>
<td>3,118</td>
</tr>
<tr>
<td>Wind</td>
<td>22,000</td>
<td>142</td>
</tr>
<tr>
<td>Solar</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>Biomass</td>
<td>450</td>
<td>27,4</td>
</tr>
<tr>
<td>Geothermal</td>
<td>3,000</td>
<td>0</td>
</tr>
</tbody>
</table>

In the near future, it is likely that the solar industry will provide the largest opportunity for energy export growth and rural-electrification, particularly for communities in the Amazon region. Consequently, several off-grid project tenders have also been floated.

In the wind sector, future investment depends on the success of several projects presently under construction. In April 2014, the first wind farm park in Peru, Marcona, became operational. It was developed by the Spanish concern Cobra Energia. The Talara and Cupisnique sites (110MW) are also scheduled to become operational this year, and their performance will have a positive impact on future support for such projects.

Decree No. 020-2013-EM, enacted in June 2013 under the umbrella of the LRER, deals specifically with the off-grid supply of electricity. Under this Decree, the government carried out an auction at the end of 2014, which resulted in the energy developer Ergon Power being awarded a contract for the construction of PV systems to supply 500,000 users in off-grid regions of the country.
The systems will be installed in the northern, central and southern regions of Peru and electricity services will be provided to homes, schools and health centres for a period of 15 years.

Support regimes
The LRER promotes the sale of renewable energy through public tenders. Its current applicable rules (RLRER) were approved through Supreme Decree No. 012-2011-EM in March 2011. This legislation establishes the regulation for the renewable energy tendering process and includes incentives such as priority for the dispatch of electricity and access to the transmission and distribution network, long term stable tariffs through bidding, and guaranteed purchase of the total electricity produced. In addition, Decree No. 1058 allows for the accelerated depreciation (for income tax purposes) of up to 20 per cent of the investments in machinery, equipment and civil construction for renewable energy generation.

Several projects (60 in total) have been funded through the United Nations’ Clean Development Mechanism, including El Platanal Hydropower Plant, which is located near the country’s capital Lima.

Obstacles/challenges
Low prices
The main obstacle is the government and private sector emphasis on developing natural gas resources rather than renewable energy. For example, tax incentives make gas-fuelled power more favourable to build than hydropower. Government subsidies for natural gas extracted from Block 88 of the famous Camisea project have created exaggeratedly low prices for natural gas, since pricing for the block does not include the exploration cost incurred. This creates market distortions which further set back profitability in renewable generation. When current resources are depleted (which is likely in the next 20–30 years), natural gas from other blocks will command a far higher price which may provide a fillip to installed renewable energy projects.

Approval of projects
The onerous environmental assessment requirements are a frequent source of delay and several prescribed procedures are suited to the oil and gas industry rather than renewable energy projects.

Transmission infrastructure
Whereas the potential for renewable energy development in the Amazon and Andes regions is high, these areas do not possess the concomitant transmission infrastructure to distribute electricity nationally. Investment in large-scale renewable energy projects may therefore involve significant investment in transmission infrastructure upfront.

The future
In total, three public auctions have taken place, the latest being in August 2013. These tenders have been successfully implemented by MINEM with four local Peruvian banks providing funding. In 2014, 24 mini-hydro projects have been awarded a PPA for a total installed capacity of 180MW, along with four wind power projects and five solar power projects, for a total installed capacity of 232MW and 96MW respectively. Finally, four biomass PPAs were awarded for a total installed capacity of 29.4MW. The government is currently accepting offers for a public auction of PPAs of wind, solar PV, biomass and small hydro capacity.

COP21
Peru has been playing an important role in relation to the Conference of the Parties to the United Nations Framework Convention on Climate Change. In 2014, Peru was the host country of the COP 20, at which there was a shift in the UN’s emphasis away from attempting to reach hard universal targets and towards a system under which individual nations would report their current status and make measurable national commitments, and the loss and damage element would be respected. Since the COP20 was held, the UN has worked on the improvement of the Peru draft treaty and in October 2015 it released a new draft which is a step forward for the talks, slimming down the text from more than 90 pages to just 20. The new draft will be subject to negotiation between the participant countries of the COP21.
Renewable energy in Latin America

Uruguay

Energy generation by type in Peru

- Coal
- Oil
- Gas
- Biofuels
- Waste
- Nuclear
- Hydro
- Geothermal
- Solar PV
- Solar Thermal
- Wind
- Tide
- Other sources

2013 Energy Production in GWh.

The opportunity

As a consequence of high GDP growth and an increase in industrial consumption of power, Uruguay’s energy demand is constantly on the rise. The country does not possess native fossil fuel resources and while it has a number of hydropower plants, these do not operate during dry periods, forcing the country to purchase electricity from Argentina at up to US$400/MWh.

In 2008, the Política Energética Uruguay 2030 was approved by the National Congress. It established a target of 15 per cent of electricity demand to be derived from renewable sources (wind, biomass and micro-hydro projects) by 2015. In 2013, this target was overhauled to an ambitious 90 per cent of total capacity being generated through renewables by the end of 2015. In June 2015, however, comments from Gonzalo Casaravilla, chairman of the state-owned electric utility UTE, indicated that this goalpost had been moved to the end of 2016.

Uruguay has vast wind resources and has been cited as the fastest-growing wind market in the world in 2014, according to the World Wind Energy Association. The country possesses 600MW of installed capacity and an additional 600MW under construction. Forecasts in the EY Renewable Energy Country Attractiveness Index indicate that Uruguay will be the global leader for wind energy as a proportion of the total energy mix, expected to reach 30 per cent by 2016, up from 13 per cent currently. UTE further announced a goal earlier this year to generate 38 per cent of its power from wind by the end of 2017.

Uruguay has brought in numerous overseas companies, such as Nordex and Gamesa, to develop wind through its auction process. Through the auctions, about 21 projects were awarded contracts in 2013 with guaranteed 20-year PPAs with state-owned electricity distribution companies. The approximate US$2 billion to be spent on wind farm installation is touted to be one of the largest investments in the country thus far. In March 2014 the financing for the 140MW Pampa wind farm was finalised, which is due to be operational in 2016 and will be the largest wind farm in Uruguay. Recently, in September 2015, Enel Green Power completed and commissioned the 50MW Melowind project, its first wind farm in Uruguay.

Biomass resources are currently the largest renewable source generating electricity, accounting for 13 per cent of generation in 2014. This source has further potential due to the strength of Uruguay’s agricultural, livestock and forestry industry. In this light, an environmental subsidy is being considered by Uruguay for the construction of an urban waste bio-mass plant. A limited feed-in tariff for biomass, introduced in 2010, is currently being revised due to mixed results.

Furthermore, the country has sufficient solar radiation to develop solar PV and STE projects. UTE, who developed the ‘Plan Solar’ framework for developing these technologies alongside the Uruguayan government, has reported that the country’s PV generation increased from 362MWh in 2013 to 653MWh a year later.

Potential

Climatescope 2014 ranked Uruguay sixth on the Clean Energy Investment and Climate Financing scale, up from 11th in 2014. From 2006 to 2012, US$394 million of funds were invested in renewable energy projects, and this grew by 43 per cent in 2012. It is likely that investments will grow further in the coming years as more contracts awarded in recent auctions achieve financing. So far, mainly international institutions, including OPIC, IDB, IFC and MIF, have provided funding for renewables projects. The tide seems to be turning, however: in 2014 IDB approved US$65.9 million for the 64.8MW ‘La Jacinta’ solar farm, Uruguay’s first utility scale project, and in May 2015 it announced significant financial support in the form of US$72 million in loans to the Colonia Arias and Valentines wind farms, both 70MW projects.
Support regimes

The regulatory framework governing renewable energy is extensive in comparison with other Latin American countries. In 2007, an investment promotion policy was approved, allowing companies to recover up to 100 per cent of an investment through a tax exemption conditional on factors like employment generation, decentralisation, increased exports, increased domestic value added, use of clean technologies, increased R&D and innovation and impact of the project on the economy. The new methodology for evaluating investment came into force in February 2012 under Decree 002/012. Further, Decree 354/0091, which favours certain activities related to the renewable energy industry, grants tax incentives, such as exemption from VAT, import taxes and fees.

Additionally, Law 18,585 on Solar Thermal Energy Promotion promotes the development of solar thermal energy through tax incentives and an obligation on hotels, sport clubs and hospitals to obtain 50 per cent of the energy required to heat the water from solar thermal energy. Finally, Decree Nº 173/010 authorizes subscribers connected to the low voltage distribution network to install renewable energy generation systems using sources such as wind, solar, biomass or micro hydro.

Obstacles/challenges

Several challenges exist, including the expansion of an appropriate transmission infrastructure network. The development of adequate financial structures for renewables projects is a precondition for continued success in the sector. Despite the incentives offered by the government and Uruguay’s recovery from the 2002 financial crisis, caused by neighbouring Argentina’s financial crisis, finding appropriate sources of funding remains an issue. Local banks do not have the capacity to fund the costs of large infrastructure projects, so the need for international financiers is paramount. Since Uruguay is a relatively small and untested market, many international financiers have bypassed it for larger and more established neighbours such as Brazil. Uruguay’s relatively stable political system, strong support from state owned utilities such as UTE, and strong track record of servicing foreign debt should help overcome these issues. However, Uruguay still fares well in comparison with its peers, since it has one of the highest levels of electrification in South America.

The future

The Minister for Industry, Energy and Mines, Carolina Cosse, stated in May 2015 that installed capacity in 2016 would reach 1,538MW from hydropower, 1,400MW from solar and 1,500MW from wind. As at July 2015, there are over 20 operational wind projects with a total installed capacity of 600MW. A further 600–700MW is awaited and under construction. The Cámara Solar trade body aims for Uruguay to have one million square metres of solar panelling in place by 2020.

In 2006, Uruguay instituted an auction mechanism to guarantee stable demand and prices, with contracts awarded of up to 20 years, and the ability to trade surplus power in the spot market. Under this mechanism, UTE have auctioned several wind and solar projects. The country expects to secure investments of US$1.74 billion for renewable energy between 2015 and 2019 under PPAs, according to a plan announced by the government in July.
Our renewable power experience in Latin America

Argentina
- Ming Yang on its proposed acquisition of two 50MW wind farm projects in Argentina.
- CDB on the financing of a 100MW wind farm in Argentina using China Hydro turbines.

Brazil
- A multilateral lender with the restructuring of a loan for construction of an 880MW hydroelectric plant in Santa Catarina, Brazil.
- A bank that supports the financing of US goods and services in connection with the provision of a loan guarantee for the financing of a wind farm in Brazil.
- China Development Bank with the project financing of a 34MW Brazilian wind farm.
- China Development Bank with the proposed financing of a 125MW wind farm using Sinovel turbines in Brazil.
- Private equity company in connection with its purchase of US$15m in senior secured notes and warrants to the US parent of a sugar cane and bioethanol producer in Brazil.

Chile
- Two multilateral lenders with respect to the project financing of a merchant solar PV plant in Chile. The project involves the expansion of an existing 1.5MW plant to a total capacity of 31.5MW.
- Two multilateral lenders in connection with the financing of three photovoltaic solar power plants with a total nominal installed capacity of approximately 24.5MW in Chile, that are among the first large-scale solar energy projects in the region.
- A multilateral lender in connection with its financing of a 46MW merchant wind farm in Chile with an emissions reduction purchase agreement selling carbon credits.
- China Development Bank on the non-recourse financing of a 34MW merchant risk wind farm in Chile.

Colombia
- The project sponsor on attracting, contracting with and its ongoing relationship with a strategic investor having responsibility to obtain project financing for 2 solar power projects with a total of 50MW capacity in Colombia.
- The Investment arm of a power and automation technology company in connection with the sale of the direct and indirect interests in a power plant located in Colombia, with a capacity of 830MW.

Dominican Republic
- A multilateral lender with the financing of a 30.6MW wind power project in the Dominican Republic.
- A multilateral lender in with the financing of a 50MW wind power project in the Dominican Republic.

Ecuador
- Hanergy on the development of project origination agreements in Ecuador for solar projects.
- Advising a multilateral lender in the construction of two solar power projects in Ecuador with 50MW of power capacity.

El Salvador
- Representing a multilateral lender in connection with the financing of eight solar photovoltaic (PV) power projects with an aggregate capacity of approximately 27.17MWp located across four different sites in El Salvador.

Guatemala
- A multilateral lender with the secured financing of a 43MW hydroelectric power plant in Guatemala.

Honduras
- Two multilateral financial institutions with their investment in a 38.5MW run-of-the-river hydroelectric power project located in Honduras.
- Represented a multilateral lender in connection with the project financing of a 38.6MW solar power project in Honduras.
- Representing a multilateral lender in connection with a 50MW solar photovoltaic (PV) project and transmission line in the city of Nacaome, Department of Valle in Southern Honduras.
- Advising three multilateral lenders with the financing of a 50MW solar plant located in Honduras.
- Advising two multilateral lenders and a national development bank with the financing of a 50MW solar plant located in Honduras.
Mexico
A multilateral lender with the financing of the purchase of equity interests in a 74MW wind power project in the Isthmus of Tehuantepec, Oaxaca, Mexico.
An export credit agency in connection with the financing of solar equipment to be installed in a solar project in Mexico.

Panama
Senior lenders with the secured financing of a hydroelectric power project in Panama.
A group of multilateral and commercial lenders with the financing of two run-of-the-river hydroelectric power plants with an aggregate capacity of 85MW in Panama.

Peru
A multilateral lender regarding a loan to invest in Peruvian solar projects.
A multilateral lender with the financing to a company of the purchase of equity interests in two solar plants in Peru and a transmission line in Brazil.
International power company in connection with two wind projects totalling 119MW.

Uruguay
Polesine S.A, a subsidiary of Akuo Energy, with the project financing of a 50MW wind farm in Uruguay, provided by PROPARCO, FMO and DEG.
China Development Bank on the financing of a 50MW wind farm in Uruguay that uses Gold Wind turbines.
Representing a multilateral lender in connection with the financing of the construction, operation and maintenance of six solar power plants and its associated facilities, in the Rio Negro Department, Uruguay.

Multiple countries
Suez S.A. on its successful competing takeover offer for Econergy International, a London AIM stock exchange listed developer of renewable energy projects in Central and Latin America.
Multilateral lender in connection with its equity contribution in three solar plants in Peru and Brazil.
Norton Rose Fulbright in Latin America

Renewable energy in Latin America

- Wind energy
- Hydro
- Biomass
- Solar