USAID FROM THE AMERICAN PEOPLE

CEADIR Climate Economic Analysis for Development, Investment, and Resilience

USING BONDS AND OTHER FINANCIAL INSTRUMENTS TO DEVELOP CLIMATE-FRIENDLY INFRASTRUCTURE IN PERU

Market Assessment Desktop Study

THE CEADIR PROJECT

Contract No.: AID-OAA-I-12-00038, Task Order AID-OAA-TO-14-00007

Photo credit: Integrarse

Crown Agents-USA Ltd. | 1129 20th Street NW | Suite 500 |
Washington, DC 20036 | T. (202) 822-8052 |
www.crownagentsusa.com

With:
Abt Associates Inc.

USING BONDS AND OTHER FINANCIAL INSTRUMENTS TO DEVELOP CLIMATE FRIENDLY INFRASTRUCTURE IN PERU

Market Assessment Desktop Study

THE CEADIR PROJECT

Contract No.: AID-OAA-I-12-00038
Task Order AID-OAA-TO-14-00007

Prepared by: Crown Agents USA Ltd *with Abt Associates Inc.*, Washington, DC.

Submitted to: Offices of Economic Policy and Global Climate Change

Bureau for Economic Growth, Education and Environment/Economic Policy

U.S. Agency for International Development

1400 Pennsylvania Avenue, NW, Room 2.11.93

Washington, DC 20523

October 28, 2015

DISCLAIMER
The authors' views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development (USAID) or the United States Government.

CONTENTS

1. SUMMARY OF ACTIVITY SCOPE OF WORK 8
2. PERU COUNTRY CONTEXT 9
2.1 Peru Geography 9
2.2 Peru Economy 9
2.3 Peru Exchange Rate Policy and US Dollarization 11
2.4 Peru Capital Markets 12
3. BOND MARKET IN PERU 14
3.1 Peru's Bond Market 14
3.2 Green Bonds in Peru 17
3.3 Project Bonds in Latin America and Peru 20
3.4 Municipal Green Bonds 21
4. SUSTAINABLE LANDSCAPES: OVERVIEW AND OPTIONS FOR BONDS IN PERU24
4.1 Green Infrastructure for Sustainable Landscapes: Definitional Challenges 24
4.2 Sources of Landscape Unsustainability 25
4.3 Targeting Needs for Sustainable Landscapes and Climate Change 26
4.4 Green Bonds for Sustainable Landscapes in Peru 27
4.5 Structuring of Green Bonds 29
4.6 Examples of Current Investment Needs 30
5. CLEAN ENERGY OVERVIEW AND BONDS IN PERU 32
5.1 Overview 32
5.2 Clean Energy Policy 32
5.3 Clean Energy Sector FInancing 34
5.4 Green Bonds for Clean Energy 39
5.5 Renewable Energy Asset and Resource Maps 40
6. CLIMATE-FRIENDLY INFRASTRUCTURE IN THE CONTEXT OF PERU'S INDC AND NAMAs 44
6.1 Peru's Intended Nationally Determined Contribution (INDC) 44
6.2 Nationally Appropriate Mitigation Actions (NAMAs) 47
Annex A: Tentative Schedule of Meetings 49

Annex B: Background Information on Scheduled Stakeholder Meetings 50
Annex C: Potential Additional Meetings in AFOLU Sector 60
Annex D: Green Bonds: Global and Latin American Data 61
Annex E: Draft SOW 65
1. OBJECTIVE 66
2. RATIONALE 66
3. SCOPE OF WORK 68
3.1 APPROACH AND METHODOLOGY 69
3.2 PROPOSED TASKS 70
3.3 DELIVERABLES 71
4. TIMELINE 72
5. PROPOSED STAFF 72
6. BUDGET 75

LIST OF FIGURES

Figure 1. Topographic Map of Peru Source: Wikipedia Commons 9
Figure 2: Overall PPP Rreadiness Sscores 2014 20
Figure 4: New Clean Energy Investment by Country, 2010-2015 ($M) **Error! Bookmark not defined.**
Figure 5: Annual Investment, 2010-2015 ($M) ..... **Error! Bookmark not defined.**
Figure 6: New Build Renewable Asset Finance by Type in Peru, Disclosed Deals Only **Error! Bookmark not defined.**
Figure 7: New Build Renewable Asset Finance by Type in Peru, Including BNEF Estimates for Undisclosed Deals ..... **Error! Bookmark not defined.**
Figure 8: Geographical Distribution of Renewable Energy Power Plants, by Technology (Including Under Planning, in Construction, and Commissioned) ..... **Error! Bookmark not defined.**
Figure 9: Wind Speed Map and Location of Wind Power Plants, with Darker Areas Indicating Higher Average Wind Speeds ..... **Error! Bookmark not defined.**
Figure 10: Solar Irradiance and Location of Solar Power Plants, with Darker Areas Reflecting the Highest Solar Resources ..... **Error! Bookmark not defined.**

LIST OF TABLES

Table 1: Expected GHG Emissions Reductions Associated with Mitigation Measures of the AFOLU Sector, Peru ..... **Error! Bookmark not defined.**

Table 2: Levels of Ambition by Type of Mitigation Measures in AFOLU, Peru**Error! Bookmark not defined.**

Table 3: Marginal Economic Analysis of Mitigation Measures for the AFOLU Sector, Peru**Error! Bookmark not define**

Table 4: Examples of Sustainable Forestry and Agriculture Investment Needs**Error! Bookmark not defined.**

Table 5: Top Renewable Energy Project Finance Lenders ($M), 2005 - Q2 2015**Error! Bookmark not defined.**

Table 6: Top Renewable Energy Asset Owners (MW), 2005 - Q2 2015**Error! Bookmark not defined.**

Table 7: Challenges for Renewables in Peru and Recommended Actions to Address Them**Error! Bookmark not defin**

Table 8: Mitigation Options Identified as Part of Scenario 3, Including Sector and Emission Reduction Potential 45

ACRONYMS

AD	Alternative development
ADR	American depositary receipt
AFOLU	Agriculture, forestry, and land use sector
AFP	Administradoras de Fondos de Pensiones
BAML	Bank of America Merrill Lynch
BaU	Business as Usual
BCRP	Banco Central de Reserva del Peru
BVL	Bolsa de Valores de Lima
CDCS	Country Development Cooperation Strategy
CEADIR	Climate Economic Analysis for Development, Investment and Resilience
CPI	Consumer price index
DO	Development Objectives
FI	Financial instrument
GDP	Gross domestic product
GHG	Greenhouse gas
GIPC	Government-issued payment certificate
GOP	Government of Peru
IDB	Inter-American Development Bank
IFC	International Finance Corporation
INDC	Intended Nationally Determined Contribution
LEDS	Low emission development strategies
MEM	Ministerio de Energia y Minas
MILA	Mercado Integrado Latinoamericano
NCCMP	National Climate Change Management Program
OSINERGMIN	Organismo Supervisor de la Inversion en Energia y Mineria (Supervising Agency for Invesment in Energy and Mining)
PEN	Peruvian Nuevo Sol
PPIAF	Public-Private Infrastructure Advisory Facility
PPP	Public-private partnership
SEIN	Central interconnected system
SNTA	Sub-National Technical Assistance

UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
USD	United States dollar

1. SUMMARY OF ACTIVITY SCOPE OF WORK

USAID/Peru seeks technical assistance to conduct a comprehensive assessment of the potential for using bond issuances or other financial instruments to finance green, climate-resilient infrastructure in key regions of Peru. The USAID Climate Economic Analysis for Development, Investment, and Resilience (CEADIR) project, a USAID/GCC supported global initiative, will provide support to develop and undertake an assessment for the USAID Peru Mission in collaboration with multilateral, national, and regional partners to determine the viability of using bonds or other financial instruments to finance climate-friendly investments in sectors such as clean energy, sustainable landscapes, and transport, as well as adaptation projects in sectors such as water.

The specific objectives of this analysis are to:

- Assess the existing impediments and incentives (legal and regulatory as well as financial) to/for launching a bond-based green financial structure for scaling up low-emission, climate-resilient infrastructure, clean and renewable energy, and sustainable landscapes, including a brief look at the broader enabling environment;
- Assess the size and volume of potential bond issuances or other financial instruments in accordance with the capabilities of the domestic and regional capital markets;
- Identify regions and municipalities in Peru that have a demand and capacity to develop climate friendly infrastructure projects;
- Identify potential private sector parties that would bid on development and construction of green/climate-friendly infrastructure projects and the financial incentives likely to be most effective in attracting their interest;
- Compile from readily available existing public information (including available national, department-level and Inter-American Development Bank (IDB) portfolios) a pipeline of potential climate-friendly projects that could be financed as pilots with regional, national, and/or municipal bond issuances;
- Identify the greenhouse gas (GHG) mitigation potential of "green" bond-financed projects in Peru; and
- Evaluate the use of green bonds or alternative financial instruments (FIs) for financing key team-identified low emission development strategies (LEDS) clean energy, sustainable landscapes, and adaptation actions, as they connect directly to the National Climate Change Management Program (NCCMP) and the USAID Peru Mission's climate change program portfolio.

The output from CEADIR technical assistance to USAID/Peru will be an assessment that provides the country with detailed knowledge about the opportunities and capabilities to use bond issuance for financing green/climate friendly infrastructure investments aligned with national climate change and development goals. The final report will provide recommendations on how USAID/Peru could support green bonds and public-private partnerships (PPPs) to develop climate friendly infrastructure in Peru in conjunction with the IDB.

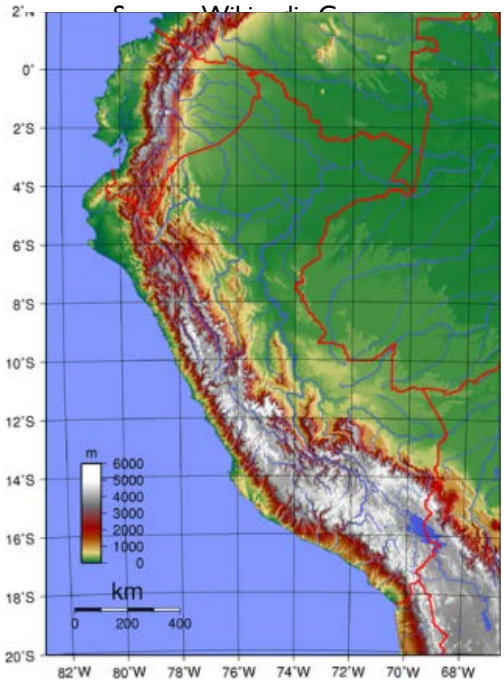
2. PERU COUNTRY CONTEXT

2.1 PERU GEOGRAPHY

Peru is located on the west central coast of South America. It is bordered by the Pacific Ocean to the west, Chile to the south, Bolivia and Brazil to the east, and Colombia and Ecuador to the north. With a total land area of 1,285,215.60 km^2, Peru is the third largest country in South America after Brazil and Argentina, and can be divided geographically into three natural regions:

- Although the Coast, a narrow strip along the ocean measuring approximately 3,080 km long, accounts for only 10.7 percent of Peru's territory, it is home to approximately 17.4 million inhabitants. Lima, the political and financial capital of the country, is located in this region.
- The Highlands, or Sierra, is the site of the Andean Mountain Range, covering 31.8 percent of national territory and serving as home to approximately 10.9 million inhabitants. This region contains the country's major mineral deposits.
- The Amazon Rainforest or Selva is the largest region. It occupies 57.5 percent of the country's territory and is rich in petroleum, gas and forestry resources. There are approximately 2.9 million inhabitants in this area.[1]

Figure 1. Topographic Map of Peru



Source: Wikimedia Commons

2.2 PERU ECONOMY

The Peruvian economy, which is the seventh largest in Latin America, is dominated by the services sector (60 percent of GDP)—particularly telecommunications and financial services—and industry (35 percent of GDP). In the past decade Peru has displayed strong economic performance, reaching high growth rates, low inflation, macroeconomic stability, and reduction of external debt. During the financial

[1] Peru Business and Investment Guide, 2014-15. Ernst & Young, No date. Available at http://www.ey.com/Publication/vwLUAssets/Peru-Business-and-Investment-guide-2014-15/$FILE/Peru%C2%B4s%20Business%20and%20investment%20guide%202014-2015-2.pdf

crisis of 2009, Peru's economy registered a modest growth, followed by a speedy recovery at an average rate of 6.5 percent during 2010 – 2014.[2]

Domestic demand has been the main driver of growth as an overall improvement in confidence in the economy has boosted domestic consumption and investment. Moreover, the steady fiscal consolidation that led to a number of budget surpluses in the past decade has increased confidence in public finances and allowed for productive public expenditures. A period of relatively stable inflation (CPI end of period annual variation was 2.7 percent in 2012, 2.9 percent in 2013, and 3.2 percent in 2014)[3] and the progressive appreciation of the national currency, the sol, through 2012 have helped the economy overcome periods of nominal volatility. Although the external sector's contribution to economic growth has been diminishing, exports have remained strong. The main detraction from the external sector's contribution to growth has stemmed from increasing imports, although capital goods imports have remained at healthy levels, which bodes well for the country's productive capacity, economic growth and employment in the coming years.[4] (Note that in the last two years, the sol has depreciated; it has now stabilized, but is trading at historically weak levels, recently at 3.22 against the US dollar.) [5]

Economic growth has been accompanied by a sustained decrease in the poverty rate. Indeed, between 2005 and 2014, the poverty headcount fell from 55.6 percent to 22.7 percent, while extreme poverty was reduced from 15.8 percent to 4.3 percent. Similarly, the record in shared prosperity has been very positive, with income growth of the bottom 40 percent averaging 6.6 percent per year against 3.7 percent for the overall population between 2008 and 2013. Notwithstanding this improvement, disparities across the country remain high, particularly between rural and urban areas. In 2014, while the poverty rate was only 15.3 percent in urban areas, it stood at 46 percent in rural areas. In 2011, the Government of Peru (GoP) launched an ambitious agenda to overcome social inequalities and boost productivity while maintaining high economic growth rates under a solid macroeconomic framework. Under this agenda, the main objectives are to improve access to services, increase employment, raise coverage of the social safety net, significantly reduce extreme poverty, better monitor environmental impacts, and enhance connectivity with the rural areas of Peru. In addition, the country has been engaged in a decentralization process that will allow regional and local governments to assume additional responsibilities for regulation, public expenditure management, and service delivery[6].

---

[2]http://wwwwds.worldbank.org/external/default/WDSContentServer/WDSP/LCR/2015/08/10/090224b08306316d/2_0/Rendered/PDF/Project0Inform0rt0Program000P132515.pdf http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/LCR/2015/08/10/090224b08306316d/2_0/Rendered/PDF/Project0Inform0rt0Program000P132515.pdf. World Bank Group. August 10, 2015. Project Information Document Appraisal Stage: Subnational Transport Support Program (P132515). Report No.: PIDA32099.

[3] [3] http://www.focus-economics.com/countries/peru. Focus Economics. Peru Economic Outlook. September 15, 2015. Accessed October 22, 2015.

[4] http://www.focus-economics.com/countries/peru. Focus Economics. Peru Economic Outlook. September 15, 2015. Accessed September 25, 2015.

[5] [5] http://www.focus-economics.com/countries/peru. Focus Economics. Peru Economic Outlook. September 15, 2015. Accessed October 22, 2015.

[6]http://wwwwds.worldbank.org/external/default/WDSContentServer/WDSP/LCR/2015/08/10/090224b08306316d/2_0/Rendered/PDF/Project0Inform0rt0Program000P132515.pdf http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/LCR/2015/08/10/090224b08306316d/2_0/Rendered/PDF/Project0Inform0rt0Program000P132515.pdf. World Bank Group. August 10, 2015. Project Information Document Appraisal Stage: Subnational Transport Support Program (P132515). Report No.: PIDA32099.

In recent years, under Presidents Alan García (2006-2011) and Ollanta Humala (2011-present), economic activity has benefited from a favorable international context, particularly from improving terms of trade. The expansion in economic activity has substantially increased the State's resources, prompted social cohesion policies and paved the way for more public investment projects. Moreover, the expansion of the external sector both before and after the recent global financial crisis has continued to provide increased resources to the Peruvian state, which, in turn, allowed the country to find a balanced path of growth with increased social inclusion. The combination of economic modernization, natural resource abundance and continued improvements in economic governance and political stability that have been taking place, helped Peru to emerge as one of the most improved economies in Latin America.[7]

2.3 PERU EXCHANGE RATE POLICY AND US DOLLARIZATION

The *Banco Central de Reserva del Peru* (BCRP), Peru's central bank, conducts a managed floating regime for the exchange rate of the Peruvian Nuevo Sol (PEN) versus the United States dollar (USD). The Bank allows the market to determine the value of the currency, although it intervenes to avoid large fluctuations. In a financially dollarized economy, as Peru has been, the stability of the exchange rate is crucial to promote firms' investment and consumer confidence. Because consumers and firms might borrow in USD but buy and sell products in local currency, any fluctuation of the foreign exchange can lead to distortions in both production and consumption decisions. Despite the fact that the Peruvian financial system has been progressively reducing its degree of US dollarization, the BCRP is highly vigilant about the fluctuations of the sol.[8]

Recently, BCRP approved several measures to foster the reduction of dollarization levels by lowering cash reserve requirements for deposits in local currency while increasing those for US dollar deposits. The central bank also created incentives to reduce US dollar loan portfolios by at least 10 percent by the end of 2015. Acknowledging that the expected soles-denominated loan growth is not matched by a similar growth in sol deposits, the BCRP is making available repo mechanisms for US dollar-denominated assets as a way to bolster liquidity levels in soles.

High dollarization levels have been a structural feature of Peruvian banks for years. Dollarization has generally trended lower over the past decade and a half, dropping to 45 percent of loans as of the third quarter of 2014, down from 83 percent at year-end 2000. Deposits followed a similar trend, but tend to swing to dollars in periods of crisis (2008-2009) or when there is a clear expectation that the dollar will appreciate (2013-2014). The latter effect is in part driven by the importance of pension funds' deposits in the banking system, which tends to seek a gain in value rather than yield.

Recently however, the banking system has been building up an asymmetry on the liquidity levels on both local and foreign currencies. Deposit dollarization declined to about 40 percent in March 2013, but increased to 48 percent in November 2014 as the US dollar appreciated, thus creating ample liquidity in dollars to the detriment of liquidity in local currency. This is in part limiting the growth of banks' local

[7] http://www.focus-economics.com/countries/peru. Focus Economics. Peru Economic Outlook. September 15, 2015. Accessed September 25, 2015.

[8] Ibid

currency loan portfolios. While regulators have been proactive in promoting the usage of local currency, they have been careful to create incentives rather than penalties.

Peru's strong external balance, low indebtedness and ample foreign reserves—as well as banks' sound credit policies—mitigate the dollarization risk. BCRP's recent moves aim to provide local currency liquidity and incentives to use it; these are means to achieve its higher objective of reducing dollarization while bolstering credit and economic growth. BCRP's measures create additional incentives for banks to lend in soles—recent local currency depreciation feeds demand for loans in soles—but do little to change depositors' behavior.

Dollar deposits accounted for 48 percent of total deposits at November 2014, but generated only 13 percent of the deposit funding costs. About 58 percent of dollar-denominated deposits are in the form of very low-cost demand deposits (mostly held by corporations and pension funds). Banks cannot really lower interest rates more to discourage such deposits that should be transactional in nature. In Fitch Rating's opinion, previous experiences that used the cash reserve requirement as way to curb loan growth had mixed results in 2009-2010. Under a scenario of faster conversion of loans into soles without a similar rise in local currency deposits, pressures on local currency liquidity can rise to levels that would present a burden for the industry. BCRP's intervention is a good step forward, but not a long-term solution.[9]

BCRP's combination of efforts to de-dollarize could be successful. However, the timing of the policies, which fall at a time of PEN depreciation, may increase implicit yields in the USD-PEN forward market. This would make foreign exchange hedging more expensive for a range of agents (e.g.: banks swapping USD deposits for PEN liquidity, un-hedged corporates, foreign investors holding PEN-denominated sovereign debt, among others) that could have financial stability implications, and also create arbitrage opportunities for locals when paired with the BCRP's foreign exchange interventions in the spot market that occasionally derail money market rates. Both the dollarization in Peru (or recent re-dollarization) and BCRP's interventions could result in increased financial fragility.

2.4 PERU CAPITAL MARKETS

The development of Peru's capital markets continues apace, driven by the growing number of increasingly sophisticated local institutional investors. The growth of private pension fund administrators (Administradoras de Fondos de Pensiones, AFPs), life insurance companies and mutual funds, as well as the emergence of local family offices, have all played a part in this evolution. Nevertheless, the markets' lack of liquidity remains a major challenge. "Ours is a market that should not have liquidity of $15 million per day," said Christian Laub, president of the Lima Stock Exchange (Bolsa de Valores de Lima, BVL) and CEO of Credicorp Capital. "We should be seeing this level reach $200 million, $300 million or $500 million per day in the equity capital markets alone, which should then also be reflected in the bond, currency and derivatives markets." Recent years have seen interesting developments on the debt capital market side, but the market still lacks depth.[10]

The Latin American Integrated Market (*Mercado Integrado Latinoamericano*, MILA) is one initiative that is expected to play an important role in increasing the liquidity of Peru's capital markets. Indeed, Peru

[9] www.fitchratings.com. "Fitch: Peru's Banks' Ratings Not Aided by De-Dollarization" http://www.reuters.com/article/2015/01/12/idUSFit89628020150112

[10] The Report: Peru 2015 http://www.oxfordbusinessgroup.com/peru-2015. Oxford Business Group.

stands to benefit the most from the MILA, as its stock market is the smallest and most illiquid of the group—which includes Peru, Chile, Colombia and Mexico. Strong demand for Peruvian companies' American depositary receipts (ADRs) is evidence of the foreign interest in Peru's capital markets that the MILA project seeks to build on. The MILA officially started operations on May 30th, 2011. It was in December 2014 that Mexico has its first trade.

While regional initiatives, like the MILA, can contribute to the country's capital markets development, domestic reforms in tax and regulatory regimes are needed as well, and financial markets participants are working with the government on these.[11]

Private equity is an area that has attracted increasing investor interest, albeit starting from a small base. The ability of pension funds to start investing in new asset classes from 2005 marked the start of a period of growth in Peruvian private equity. The Peruvian private equity sector is presently focused more on buyouts than venture capital.[12]

[11] Ibid

[12] Ibid

3. BOND MARKET IN PERU

3.1 PERU'S BOND MARKET

Although Peru's economy has been averaging more than 5 percent growth a year for the last 10 years, that growth has not, as yet, been matched by corresponding growth in the volume of bonds issued in its local debt capital markets. That said, local banks say, such as Creditcorp Capital and BBVA, say that they expect substantial growth in the market in the coming five years, from an increase in the number of medium to large companies with the scale to issue bonds as well as steady issuance from infrastructure related concessions. Also, recent foreign exchange volatility has resulted in losses by some Peruvian companies that have been issuing US dollar-denominated debt and there is expected to be a renewed focus on Nuevo Sol-denominated, local market issuances from Peru's larger companies this year.

In 2014, primary bond issuance of bonds[13] in Peru reached $1.17 billion from 30 transactions. This volume was a big drop from $1.75 billion in 2013 and $1.66 billion in 2012. However, if these numbers were to include a deal by Rutas de Lima that was structured for an international deal but was ultimately placed locally, the numbers would have been $1.69 billion in 2014.[14] It was a spike in emerging market currency volatility that eliminated international orders for Rutas de Lima. The spike in volatility also hit some Peruvian companies such as Alicorp, which issued a NS500 million ($162 million) transaction, which was, in part, conducted to buy back $87.76 million of its $450 million international transaction issued in March 2013.[15]

As the Nuevo Sol depreciates, local companies will likely turn more to local markets. "I think this year and next year we are going to see more Peruvian corporations look to the local capital markets for the larger deals because of the increase in FX volatility," says Rodrigo Mejía, director of debt and equity capital markets at Credicorp Capital in Peru.

The local market's buy-side is dominated by three very large pension funds and they are sensitive to ratings but the biggest obstacle preventing issuance growth is reportedly the supply side. In 2014, 30 issuers tapped the market, and most of those conducted very small deals, with only a few larger deals of around $300 million-$350 million. Mejía says there have been very few new issuers in recent years,

---

[13] The primary market is the part of the capital market that deals with issuing of new securities. Companies, governments or public sector institutions can obtain funds through the sale of a new stock or bond issues through the primary market. Primary issuances are the first financings by issuers. The primary market performs the crucial function of facilitating capital formation in the economy.

[14] In 2014, Rutas de Lima, a concession backed by Brazilian company Odebrecht, issued a $520 million-equivalent bond. Alongside other banks such as Credicorp Capital and BBVA, Goldman Sachs advised the Peruvian-based issuer that there would be international appetite for Nuevo Sol-denominated debt and so an international 144A/Reg S structure was used to facilitate an international book but the deal coincided with a spike in emerging market currency volatility and in the end there were zero international orders. With the transaction being 100 percent placed in the local market it was effectively a (very large) local deal, and had it counted in the overall local market volumes, it would have made 2014 a typical year of issuance. Since it was structured as a 144A/Reg S, however, it was not included in the total local primary bond issuance figure.

[15] http://www.euromoney.com/Article/3432959/LatAm-bond-markets-PeruReady-for-a-big-leap-forward.html?copyrightInfo=true. Rob Dwyer. March 2015. LatAm bond markets: Peru – Ready for a big leap forward.

which has stagnated the market's growth but he says Credicorp Capital is now working with five new issuers who are likely to come to the market in 2015. He hopes that within 5 years the number of annual issuers will rise to close to 50, boosting volumes. To date, the lack of size of Peruvian companies has restricted new issuers, but companies in many sectors, for example construction, have grown rapidly and also importantly increased the level of reporting and transparency needed to access the local markets. Mejía says these new issuers will be very welcome to the pension funds.[16] "Most of the issuance is dominated by financial institutions or the few large energy companies and so the institutional investors are always very receptive to new companies in new sectors."

One reason more Peruvian companies do not issue bonds locally because the local market lacks players with the necessary scale to absorb bonds of the size these companies issue offshore. Although private pension fund administrators, insurance companies and mutual funds can absorb a bond of $200 million, together there are only between 6 and 12 institutional investors in country that could buy these bonds. Many issuers of bonds seek greater diversity in the range of investors that will hold their debt, which leads them to issue offshore. "The lack of liquidity in the local Peruvian bond market is partly because many of the investors in Peruvian corporate bonds follow a buy-and-hold strategy, rendering the secondary bond market very illiquid," said Roberto Flores, head of strategy and economic research at Inteligo, a stock brokerage owned by Grupo Interbank. "Therefore, as in the rest of the capital markets, we need to implement mechanisms to stimulate greater liquidity in the bond market, perhaps drawing lessons from Colombia's experience in this field, as their markets are more liquid than Peru's."[17][18]

In spite of these obstacles, recent years have seen a steady increase in the local demand for corporate bonds in Peru. Alejandro Rabanal, head of equity research at Credicorp Capital, stated that, "The growth of the local asset management industry, as well as inflows into pension funds, have been the principal factors driving local demand for bonds"."[19]

Despite rising domestic demand, Peru has not seen matching levels of local issuance. Some large companies issue debt both locally and offshore, depending on the size of the bond, with bonds under $200 million being deemed too small to be worth the extra cost involved in issuing them abroad. As for medium companies, many have grown accustomed to dealing with the banking sector. For them, obtaining a loan from a bank is simpler, less tedious and quicker than issuing a bond, and until these companies become larger, they may be unlikely to issue bonds. While a bond could typically prove a cheaper source of finance for some medium-sized companies than what they get from their bank, the current highly liquid state of the Peruvian banking sector means that banks have been able to offer

---

[16] Ibid

[17] The Report: Peru 2015 http://www.oxfordbusinessgroup.com/peru-2015. Oxford Business Group.

[18] In 2014 total issuance in the Colombian market was $4.3 billion-equivalent, virtually identical to 2013. The market has duration (nearly 60% of deals have maturities longer than 10 years and deals of 20 years are available), liquidity (most of the deals were more than two-times oversubscribed) and size (Grupo Argos sold COP1 trillion in September 2014, which was then equivalent to $532 million). However, the pension-dominated investor base remains exceptionally ratings-sensitive – only about half of total issuance was from companies in the real economy (with the other half being financial institutions). http://www.euromoney.com/Article/3432940/LatAm-bond-markets-ColombiaOnly-for-the-strongest.html?copyrightInfo=true

[19] Ibid

corporate loans at highly competitive rates, reducing the potential savings that companies could achieve by issuing bonds.[20]

International investors are not present locally beyond national sovereign debt and even here they have been lowering their Peruvian exposures. The share of foreign-held Peruvian national debt has fallen from 56 percent in June 2013 to 44 percent in February 2015. In January 2015 alone, Peru saw outflows of $0.8 billion. These outflows probably reflect local currency weakness and a slowing of GDP growth in Q4 2014 to a five year low of 1 percent. However, economists expect GDP growth to rebound this year—not least because of a strong flow of infrastructure concessions that will both boost GDP and provide perfect projects for capital markets transactions. According to Mejía, Peru has an infrastructure deficit of $88 billion, the government has been awarding concessions and is expected to continue to do so, and the financing for those will result in both international and local debt capital market transactions. "The Lima subway concession has been awarded and at $5 billion will be too big for the local markets and so that will be sold to international investors," said Mejía, adding that nearly all the infrastructure concessions are being awarded in US dollar-denominated contracts. "However, there are other deals that are perfect for the local markets. Odebrecht has just been awarded an irrigation project which, at between $200 million and $250 million, is perfect for the local markets." Mejía noted that the pension funds will not accept the construction risk and so local and international banks will provide interim funding, before the projects are taken out by bond financings. "There is a mechanism that provides government guarantees for these concessions so we expect they will be very popular with investors, as they will pay a premium over sovereign credit for virtually the same risk."[21]

Retail investors are also interested in the government bond market. The Peruvian Government recognized the market demand for short-term government debt and started issuing notes with maturities of 3, 6, 9 and 12 months in 2013. These have been well-received, with the bid-to-cover ratio[22] consistently above one.

Even so, the local market for Peruvian government debt continues to lack liquidity. According to Christian Laub, "In Colombia, for instance, between $4 billion and $5 billion of government debt is traded per day, whereas the corresponding figure for Peru is between $60 million and $70 million, which is an enormous difference." He attributed this lack of liquidity in part to the government's prioritization of long bond terms and low rates at the expense of making the creation of a liquid market in government debt an objective in its own right. He explained, "Long-dated bonds of up to 40 years are clearly an efficient option from the government's point of view, as they avoid refinancing risks, but they do not help to build a yield curve of bonds with differing maturities that the market needs in order to generate greater liquidity."[23]

---

[20] Ibid

[21] http://www.euromoney.com/Article/3432959/LatAm-bond-markets-PeruReady-for-a-big-leap-forward.html?copyrightInfo=true. Rob Dwyer. March 2015. LatAm bond markets: Peru – Ready for a big leap forward.

[22] The bid-to-cover ratio is a ratio that compares the number of bids received in a securities auction or offering to the number of bids accepted. The bid-to-cover ratio is an indicator of the strength or demand for the securities offering relative to investor bids deemed suitable in the auction/bidding process. A higher ratio would be an indication of a strong or "bought" auction. http://www.investopedia.com/terms/b/bidtocoverratio.asp#ixzz3pPFUM8i9

[23] The Report: Peru 2015 http://www.oxfordbusinessgroup.com/peru-2015. Oxford Business Group.

3.2 GREEN BONDS IN PERU

Green bonds are essentially identical to the other bonds except that (1) the bonds are labeled as "green" by their issuer, (2) the proceeds are earmarked for green investments, and (3) the issuer tracks and reports to investors on the use of proceeds to ensure green compliance. (See section 3.4 for more information on standards.)

Key to the success of green bonds is that investors do not have to choose between financial returns and environmental benefits since green bonds offer the same financial terms as other bonds, with the added bonus for investors of being of being environmentally beneficial. If a portfolio manager is choosing between an ordinary bond and a green bond, and both have exactly the same yield and rating and a comparable price, then that green benefit may be a bonus feature. Green bonds are a good opportunity for investors who care about climate risk but face restrictions on investment instruments in their mandates from asset owners. For investors who do not care about climate change, a green bond is no different from other similarly rated bonds and can viewed simply as a standard investment opportunity.

Green bonds may be structured in several different ways. They can be general obligation bonds backed by the issuer's entire balance sheet and therefore have the same credit profile as other non-green bonds from that issuer. Alternatively, they may be revenue bonds backed by specific revenue streams (e.g., water or sewer fees or tax revenues), rather than the issuer's full balance sheet. They can be project bonds backed by the financial performance of specific green projects. Revenue bonds, like general obligation bonds, allow investors to invest in green projects at the same credit risk as non-green bonds with the same format. Project bonds allow investors to gain exposure to green project risk and returns. Asset-backed securities (backed by a pool of smaller projects) are another option for investors looking to invest in green projects.

Example of Energia Eolica Green Bond

Peruvian windfarm operator Energia Eolica became the first Latin American issuer, public or private, to sell a green bond when it placed a $204 million 2034 project bond with an annual yield of 6 percent in December 2014. Proceeds from this bond are slotted for the Cupisnique and Talara windfarms, which have a 20-year purchase agreement with the Peruvian government. According to LatinFinance, strong demand from Peruvian pension funds allowed Bank of America-Merrill Lynch and Goldman Sachs to significantly tighten (reduce spreads in) the transaction despite its relatively small size. LatinFinance also indicated that the borrower, which is owned by US energy firm ContourGlobal, roadshowed the offering in Boston, Lima, Los Angeles, London, and New York ahead of the transaction. Although foreign investors placed orders, Peruvian pension funds and insurance companies comprised more than 80 percent of the order book.

Peruvian investors were said by market analysts to be more comfortable with the deal because of greater familiarity with the country's economy. The pension funds are also keen to invest in infrastructure and have bought project bonds from Terminal Paita and the Abengoa Transmision Sur in recent years, according to *LatinFinance*. They also have less concern for size—something critical for international buyers who demand a higher price for less liquid transactions.

This transaction is not the first renewable energy bond sale in Latin America.—Spain's Acciona, for example, sold two bonds to finance wind farms in Oaxaca, Mexico in 2012. However, the Energia Eolica deal was the first from the region to be certified by auditors as complying with green bond conditions.

Those requirements dictate that the funding be used specifically for a project that has describable, quantifiable, and/or assessable environmental benefits.[24]

Amid a surge of use-of-proceeds green bonds last year, Energia Eolica stood out from the crowd with its labelled project bond. "I believe, in 2014, this is the only renewables project bond done—everything else in the space has been financed behind the scenes using bank loans or syndicated debt," says Suzanne Buchta, managing director and global co-head of green bonds and market-linked notes at Bank of America Merrill Lynch (BAML), an underwriter on the deal.[25]

Tight pricing [26] from private lenders has meant most renewables developers have recently turned to traditional project financing to fund projects, but Juan Carlos Lorenzo, head of Latin American finance at Goldman Sachs (—another underwriter on the bonds) said—said this will not sustain demand in the region.[27]

"Latin America requires major investment into energy, power, and infrastructure, and often you'll find banks don't have the capacity to provide the levels of capital needed, or the tenor to support projects like renewables assets," he explains, adding that this bond set "an important precedent". The bond, which has a 6 percent coupon, will repay equity and debt invested by ContourGlobal itself and a bridging-loan provided by Peruvian development bank Corporación Financiera de Desarrollo S.A. (COFIDE).

"Investors want to invest directly in bond format, and there hasn't been much opportunity," says Reggie de Villiers, head of Latin American structured finance at BAML and manager on the deal, adding that "investors are now actively trying to encourage banks and issuers to come to the market". Buchta explained, "These kind of renewables project bonds are going to [be higher yielding] than most of what you see in the bond market and that's significant because it encourages mainstream investors to get more comfortable with wind and solar risk, but it does require "a little bit more legwork up front", according to de Villiers, who points out the need for a consultant to provide data on wind probabilities for investors. "But once investors have analyzed one deal, they are able to understand these parameters and it becomes easier for them to assess for subsequent transactions," he adds.[28]

The next step for the market, in Buchta and de Villiers' view, is a broadening of the risks that investors are prepared to take in order to participate in these kinds of deals. While Energia Eolica offered fully constructed underlying projects with a long-term power purchase agreement from the Peruvian government, investors may also have to consider financing assets that are in the final stage of construction.

---

[24] http://www.latinfinance.com/Article/3411361/Energia-Eolica-brings-dawn-to-LatAm-green-bond-market.html#ixzz3ijU3EhXm Dec 17, 2014. Energia Eolica brings dawn to LatAm green bond market. Latin Finance.

[25] "Bond: Energia Eolica's green bond" April 1, 2015 https://www.environmental-finance.com/content/deals-of-the-year/bond-energia-eolicas-green-bond.html

[26] A tight market is a market with narrow bid-ask spreads. A tight market for a security or commodity is characterized by abundant liquidity and frenetic trading activity. Intense price competition on both the buyers' and sellers' sides leads to tight spreads, the hallmark of a tight market.

[27] "Bond: Energia Eolica's green bond" April 1, 2015 https://www.environmental-finance.com/content/deals-of-the-year/bond-energia-eolicas-green-bond.html

[28] Ibid

Lonrezo said this deal may encourage other issuers to consider the market more seriously, and that Goldman is in discussions with industrial companies that have previously been more hesitant to issue because proving a bond's green credentials is more complex for non pure -plays[29].

Orhan Sarayli, a managing director at US investment firm Babson Capital Management indicated that Energia Eolica was attractive because it had a "good risk/return profile" as well as being in Latin America, a region where Babson Capital is keen to increase its exposure. Sarayli, however, worries that that the green project bond market will struggle to gain momentum while traditional project financing is so competitive.

"Until banks and other traditional lenders see more activity … lending to other industries, or face regulatory pressure [regarding long-tenor lending], they will continue to find lending to renewables projects a nice risk/return opportunity" he says, adding that private capital providers are also attractive to borrowers because they do not require credit ratings or investment notes.

Buchta is bullish, "We want to build this market because, as Basel III continues to put pressure on bank balance sheets, it's unclear if financing via loans will continue to be feasible for wind and solar. I think it's simply a matter of time before the shift to the capital markets happens."[30]

Lima Metro Green Bond

Also recently issued, in June 2015, was the very large Peruvian project bond for the Lima Metro Line ($1.15 billion, 5.875 percent, 19.1 years, BBB/Baa1/BBB[31]). When we think about green project bonds generally it is solar and wind power projects that spring to mind, but other types of green infrastructure projects, such as public transit, can also be financed, or more often refinanced, through project bonds. The latest green project to issue an unlabeled green bond is Lima Metro. The bond is backed by a large underground rail (metro) system construction project, which involves creating over 35 km of tunnels and 35 subway stations in Lima.

This project also includes the electrical and mechanical equipment for the rail and the rolling stock, and the advantage of for bond markets seeking large liquid bonds. Peru's Ministry of Transport and Communications is a guarantor of the payments. This guarantee helps make it an investment project bond with a credit rating of BBB. The main buyers of this bond were asset managers and local investors, but insurance companies and banks also invested in the bond. This is a great example of how to refinance a green infrastructure project in emerging markets.[32]

---

[29] A pure play is a company that is focused on only one industry or product. Pure play companies are popular with certain types of investors who want to invest in particular products or industry segments. For these investors, buying a company with several diversified business lines forces them to take risk in industries that they did not want to be invested in. In the case of green bonds, companies that are not pure plays will need to ring-fence the proceeds to ensure the use is green.

[30] "Bond: Energia Eolica's green bond" April 1, 2015 https://www.environmental-finance.com/content/deals-of-the-year/bond-energia-eolicas-green-bond.html

[31] S&P, Moody's and Fitch credit ratings, respectively

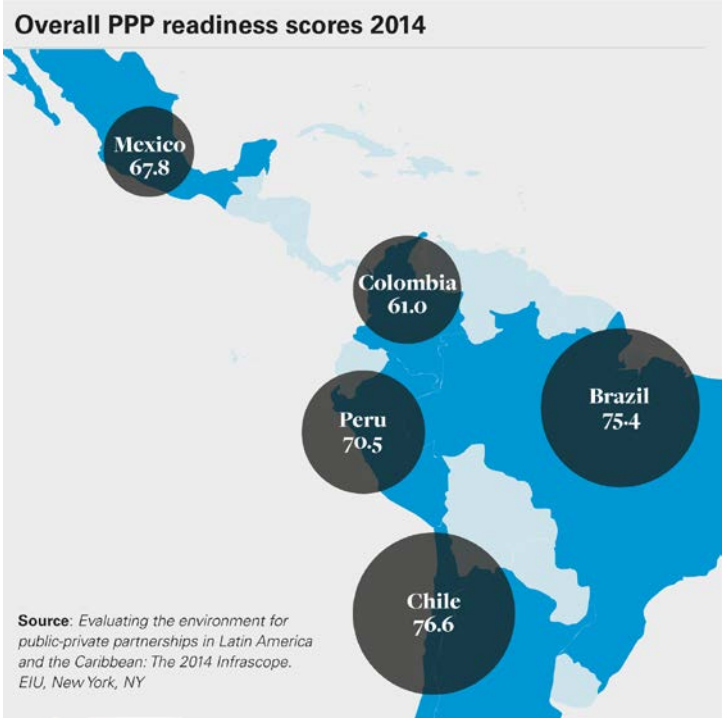
[32] http://www.climatebonds.net/2015/08/wkly-blog-first-green-bond-chinese-issuer-goldwind-300m-3yr-more-green-bonds-gothenburg#sthash.uFc7cOox.dpuf. Sean Kidney. Aug 3, 2015. "Wkly blog: First green bond from Chinese issuer Goldwind ($300m, 3yr) + more green bonds from Gothenburg SEK1bn ($126.6m), KfW £500m ($780m) & Terraform ($300m) + exciting unlabelled climate project bond: Peruvian Metro Line ($1.15bn, 19.1yrs)". Climate Bonds Initiative.

3.3 PROJECT BONDS IN LATIN AMERICA AND PERU

Project bonds continue to grow as a source of infrastructure financing in Latin America, particularly as private capital is needed to close multi-billion-dollar shortfalls in spending for infrastructure projects. Project bonds offer international investors attractive yields and the opportunity to participate in the region's infrastructure financing boom. Global project bond deals in 2014 totaled US$50 billion, with Latin America accounting for more than US$8 billion.[33]

Project bonds finance a variety of investments in transportation, communications, energy and other infrastructure. The bonds' proceeds are used to provide limited recourse, or nonrecourse, financing to a single-purpose vehicle that owns, develops, and builds a project. Buyers include insurance companies, pension funds and other long-term investors. Project bonds are appealing because they can match long-term liabilities to long-term cash flows from projects (with maturities of 20 years or more). The bonds often offer stable returns at higher rates than similarly structured sovereign debt. They usually have low volatility and little correlation with other asset classes. They have flexible financing structures and can be adapted to include multiple assets and projects. Besides the general risks associated with bond investing, including interest rate risk, project bonds may have some specific wrinkles, including construction risk, political risk and negative carry, [34] which is a situation in which the cost of holding a security exceeds the yield earned.

Figure 2: Overall PPP Rreadiness Sscores 2014



Project bonds are one way to attract more private investment and help meet the region's infrastructure deficit. According to Pricewaterhouse Coopers (PwC), there are four conditions required for a project bond market to take root – 1) available capital outside the banking system; 2) sufficient governance and transparency in financial reporting; 3) balanced tax and commercial policies; and 4) mechanisms to

[33] http://www.whitecase.com/publications/insight/why-project-bonds-are-rise-latin-america 28 July 2015. Why project bonds are on the rise in Latin America. Carlos Viana, John Vetterli, John Anderson, Sean Goldstein, Victor DeSantis. White & Case.

[34] Ibid

support credit quality.[35] These conditions are well established in Latin America. In general, there is good potential for public-private partnerships ("PPPs") financed by project bonds.[36]

Lima is in the process of rolling out its planned six-line metro transit system, with Line 1 fully operational and Line 2 (and part of Line 4) currently under construction. A new airport in Mexico City is being developed, and various road, water and desalination projects, all of which could benefit from project bond financing. Brazil has a long track record of project bond financing for oil and gas drilling in the international capital markets and power and toll road projects (in the domestic market). In June 2015, the Government of Brazil announced a US$ 64 billion infrastructure program, focused on attracting private sector investors. Colombia is planning PPPs with project bond financing for US$20 billion, 40-project program with support from multilateral development banks.

Peru is a globally recognized innovator in project bonds and, recently, has had the strongest track record in the region in using them for infrastructure investments, according to Fitch Ratings. The success of Peruvian project bonds can be attributed to two key factors. The first is the strength of Peruvian pension funds and their willingness to invest in these products. The second is a legal structure of payment mechanisms and supporting regulations developed by the Peruvian government to mitigate completion risk and provide for predictable payment streams that are less subject to operating risk.

ProInversión, Peru's private investment promotion agency, has set up PPPs to finance construction and operation of the transportation, water and social infrastructure sectors. These PPPs provide for government-issued payment certificates (GIPCs) on the completion of identified milestones in the concession works. The PPPs also allow for the securitization of those certificates into bonds as a takeout of equity or guaranteed construction bridge financing. Peruvian pension funds have accounted for much of the institutional investment in these project bonds although ProInversión is actively seeking out foreign investors.

While economic growth is not expected to be as robust in 2015 or 2016 as in 2014, the Peruvian government still wants to spend money on infrastructure. In April 2015, the Peruvian Ministry of Finance said it would increase infrastructure spending by 20 percent annually to offset a 50 percent cut in spending by regional governments as they adjusted budgets to address fiscal deficits.

Because there is a presidential election in 2016, the government may slow down awarding projects, but the pipeline is still relatively robust. ProInversión reported 19 projects to finance needing US$4.9 billion through 2016 as of April 30, 2015, o.

3.4 MUNICIPAL GREEN BONDS

Cities are critically important centers for action on climate change mitigation and adaptation, and are therefore uniquely positioned to lead the effort to fund projects to reduce energy use and promote

[35] https://www.pwc.com/gx/en/deals/swf/publications/assets/capital-markets-the-rise-of-non-bank-infrastructure-project-finance.pdf https://www.pwc.com/gx/en/deals/swf/publications/assets/capital-markets-the-rise-of-non-bank-infrastructure-project-finance.pdf. PricewaterhouseCoopers. Capital Markets: The Rise of Non-Bank Infrastructure Project Finance. October 2013.

[36] http://www.whitecase.com/publications/insight/why-project-bonds-are-rise-latin-america 28 July 2015. Why project bonds are on the rise in Latin America. Carlos Viana, John Vetterli, John Anderson, Sean Goldstein, Victor DeSantis. White & Case.

green infrastructure. Cities are also particularly vulnerable to the negative impacts of our changing climate. Investment in low-carbon and climate-resilient transportation, water, power, and buildings can address the infrastructure and climate challenges.

The municipal ("muni") bond market is a tried and trusted finance channel in the United States and other countries. Municipal bonds are one financing tool well suited to close the infrastructure investment gap. Individuals are the dominant investors, either directly as retail investors or through mutual funds. In the U.S., this is largely because the vast majority of muni bonds are tax-exempt instruments. Of the $3.7 trillion in outstanding muni bonds in the U.S., only approximately $600 billion are taxable. . Some federal programs also offer additional subsidies to attract tax-exempt investors, such as pension funds, to the U.S. muni bond market. Green bonds combine the trusted municipal bond market with features that provide additional benefits to cities and investors. Green bonds that earmark proceeds for green purposes have grown exponentially the last few years: in 2014, $37 billion in green bonds were issued worldwide, more than tripling the issuance in 2013. In the U.S., the Green Muni Bond market has grown even more rapidly. After a single $100 million Green Muni Bond issuance in 2013, $2.5 billion of Green Muni Bonds were issued in 2014 and an additional $1.3 billion have been sold through early May 2015. There is consistent, strong investor demand for US green bonds—including Muni Bonds. This rapidly growing market has the potential to help cities attract new investors and competitively priced capital to low-carbon and climate-resilient infrastructure investments[37].

Currently, municipalities in Peru cannot issue bonds. Because of the limited authority of Peruvian sub-national governments to raise tax revenues and the absence of a sub-national debt market, local governments in Peru rely heavily on national government transfers for both operating and capital expenditures. Regional governments have no authority to levy taxes and rely almost fully on central government transfers for both operating expenditures and capital investments. Municipalities finance a higher percentage of their expenditures from their own sources (e.g., property tax, real estate transaction tax, various fees, sale of goods and services, etc.) than do regional governments, but have no authority to set local tax rates, cannot issue bonds, and rely heavily on government transfers for capital expenditures.

Local governments are exploring options to better leverage their resources in order to meet large infrastructure investment. Currently, borrowing accounts for only 1percent of subnational infrastructure investment funding, with virtually all of that in Lima. Commercial banks restrict their financing of working capital to a small number of local governments. To date, the only subnational infrastructure bonds issued securitized Lima's toll road revenues, allowing for greater investment in roads.

The Public-Private Infrastructure Advisory Facility's (PPIAF) Subnational Technical Assistance (SNTA) program is helping subnational government entities in Peru raise market- financing for infrastructure investment. Since 2008, SNTA has assisted eight regional and municipal entities by facilitating credit ratings, implementing financial assessments and coaching, supporting transaction preparation, and helping the central government monitor and evaluate the financial health of local authorities. As a result of SNTA support, the Municipality of Lima signed two significant financings: a $70 million commercial bank loan with BBVA Banco Continental in April 2010and a subsequent $120 million local currency loan with BBVA and Scotiabank, signed in November 2013. The SNTA technical assistance also helped the

[37] http://www.climatebonds.net/files/files/Green%20City%20Playbook.pdf
http://www.climatebonds.net/files/files/Green%20City%20Playbook.pdf. How to Issue a Green Muni Bond: The Green Muni Bonds Playbook. Climate Bonds Initiative. No date.

Regional Government of Arequipa obtain a $10 million commercial bank loan in January 2011 to finance a regional road rehabilitation project.[38] More information is needed on subnational borrowing rules.

Funds from green bond issuances can be allocated to new projects or to refinance existing projects. As long as the proceeds go to green projects, the bond can be labeled as green. Although the market has not yet converged on criteria for use of proceeds from a green bonds issuance, there is developing guidance in this area. The Green Bond Principles provide guidance on reporting and transparency for green bonds. The Green Bond Principles[39], launched by an international group of financial institutions in 2014 and updated in March 2015, are best practice guidelines for green bond issuances regarding use of proceeds, the process for project evaluation and selection, management of proceeds, and reporting on use of proceeds. The categories and types of projects that can qualify under the Green Bond Principles include renewable energy, energy efficiency (including efficient buildings), sustainable waste management, sustainable land use (including sustainable forestry and agriculture), biodiversity conservation, clean transportation, sustainable water management (including clean and/or drinking water), and climate change adaptation.

The Green Bond Principles list these broad categories of projects but do not prescribe specific criteria for whether a specific project qualifies. For those specific criteria, the Climate Bonds Principles suggest issuers refer to those already in the marketplace, including the Climate Bonds Standards. However, compliance with specific criteria is still voluntary and there are no enforcement mechanisms yet if an issuer doesn't comply. Green bond issuance can fund projects from several of these categories. For example, one green bond can allocate proceeds to both renewable energy and clean transportation to make it easier to achieve scale. Additional guidance can be found in Ceres' Statement of Investor Expectations for the Green Bond Market[40]. This resource helps clarify for issuers some of the important, manageable expectations concerning project eligibility, disclosure, impact reporting, independent assurance and overall transparency that more than two dozen leading investors in green bonds believe should be integral to a green bond offering[41].

---

[38] http://www.ppiaf.org/sites/ppiaf.org/files/publication/Peru-SNTA-Impact-Story.pdf http://www.ppiaf.org/sites/ppiaf.org/files/publication/Peru-SNTA-Impact-Story.pdf. Public-Private Infrastructure Advisory Facility. PPIAF Helps Peruvian Sub-Nationals Tap Financial Markets. March 2015.

[39] International Capital Market Association, "Green Bond Principles," March 2015, International Capital Market Association, www.icmagroup.org/Regulatory-Policy-and-Market-Practice/green-bonds/green-bond-principles.

[40] http://www.ceres.org/files/investor-files/statementof-investor-expectations-for-green-bonds http://www.ceres.org/files/investor-files/statementof-investor-expectations-for-green-bonds. Ceres, No date. A Statement of Investor Expectations for the Green Bond Market.

[41] http://www.climatebonds.net/files/files/Green%20City%20Playbook.pdf http://www.climatebonds.net/files/files/Green%20City%20Playbook.pdf. How to Issue a Green Muni Bond: The Green Muni Bonds Playbook. Climate Bonds Initiative. No date.

4. SUSTAINABLE LANDSCAPES: OVERVIEW AND OPTIONS FOR BONDS IN PERU

4.1 GREEN INFRASTRUCTURE FOR SUSTAINABLE LANDSCAPES: DEFINITIONAL CHALLENGES

Sustainable landscapes generally refers to the mosaic of land uses in a landscape or territory that maintain natural capital while providing the goods and services required to maintain the livelihoods and well-being of its inhabitants. USAID´s sustainable landscapes program focuses on reducing greenhouse gas emissions from tropical forests and non-forest landscapes (e.g. wetlands, agricultural land) in addition to supporting local livelihoods, biodiversity, and other ecosystem services, mainly through the REDD+ approach and framework[42]. In many cases, these mitigation measures can also help to maintain or increase adaptation to climate change by increasing resilience to climate variability and risks.

Within sustainable landscapes, the concept of green infrastructure could include both physical and natural capital (e.g., land, forests, cultivars). Moreover, the variability of natural capital and the mix of productive and conservation activities within landscapes suggest the type of physical and natural capital needed to increase sustainability can vary widely, depending on the landscapes under consideration.

Given the breadth of these concepts and the diversity of landscapes and land use in Peru, green infrastructure for sustainable landscapes can assume a variety of forms. For example, in the watersheds extending from the western slope of the Andes to export-oriented agricultural centers on the dry coast, green infrastructure could include the reforestation of upper watersheds and the establishment of efficient systems of water distribution and use on the coastal lowlands. In the Amazon, a sustainable landscape could include a diverse array of land uses, including subsistence and commercial agriculture, agroforestry, forestry, extractive reserves, mining concessions, fisheries, and conservation areas of high biodiversity or other ecosystem services and the definition of green infrastructure in these areas can vary widely. Peruvian Amazon Sustainable Landscapes and Climate Change

In Peru, international cooperation, including the USAID mission, have emphasized sustainable landscapes in the Amazon. This is due to the predominance of forests there (94 percent of Peru´s forests are found in the Amazon; Peru ranks second among the Amazonian countries in forest area and fourth place in

[42] USAID Global Climate Initiative, 2013. Sustainable landscapes. http://www.usaid.gov/sites/default/files/documents/1865/GCC_Sustainable_Landscapes_30oct13.pdf

terms of tropical forests at the global scale[43]), current rates and tendencies of forest losses, and the impact of this loss on GHGs and climate change.[44]

Recent analyses of national GHG emissions have shown that forestry and forest land use change, mainly in the Amazon, accounts for about 40 percent of the national GHG emissions of 180 million tCO2e/yr. Together, forestry and agriculture account for 60 percent of Peru´s national emissions.[45]

In 2030, the contribution of the agriculture, forestry, and other land use (AFOLU) sector is expected to reach 158 million tCO2e/yr., 60 percent of the national total. Of the AFOLU total, the large majority of gross emissions are due to the conversion of primary or secondary forest to agriculture (173 million tCO2e/yr.),[46] while other activities such as firewood harvests, logging, and fires are small in comparison.

4.2 SOURCES OF LANDSCAPE UNSUSTAINABILITY

The departure point for consideration of green infrastructure for sustainable landscapes in the Peruvian Amazon needs to focus on why current landscapes are unsustainable. Direct drivers of deforestation and forest degradation in the Peruvian Amazon include agriculture, logging, and illicit activities. There are also some indirect factors.

Traditional small-scale agriculture: Traditional small-scale extensive agriculture is the primary driver of deforestation in the Peruvian Amazon and accounts for the large majority of agricultural area.[47] Productivity is sustained by the use of a system of land rotation (from forests to agricultural plots and back to forest), since the lack of capital and limited access to credit limit agricultural intensification; in essence, land substitutes for input use. Dependence on family labor and low input use translates into low productivity and profitability, which is compounded by weak market ties. Organizational, financial, commercial, and technical solutions are needed for these systems to become more sustainable.

Medium and large-scale agriculture: This group includes farms larger than 30 hectares where agriculture is more intensive and more profitable due to higher levels of productivity and stronger market ties. Industrial agriculture (agro-exports, palm, and biofuel crops) is included in this category.[48] Unlike Brazil where commercial agriculture is strongly linked to international commodity markets, agro-industrial crops in the Peruvian Amazon are mainly consumed domestically (except for coffee and cacao). Medium- and large-scale agriculture has recently expanded (land clearing of areas larger than 50 ha increased from 4,581 ha annually in 2011 to almost 12,000 ha annually in 2013),[49] based on two strategies: (1) increasing the productivity of land and labor, and (2) increasing the area of production by converting forests to

---

[43] MINAM. Estrategia Nacional de Conservación de Bosques y Cambio Climático, Propuesta Técnica Preliminar, Available at http://www.bosques.gob.pe/archivo/enbcc_documento.pdf

[44] MINAM, June 2015. Construyendo Participativamente la Contribución Nacional: Propuesta del Perú (INDC) para Consulta Pública. Available at http://www.minam.gob.pe/wp-content/uploads/2015/06/contribucion-iNDC21.pdf

[45] Ibid. MINAM (2015).

[46] L. Limachi, L. Szott, and G. Solano (2015). Propuesta tecnica actualizada de contribución del sector USCUSS al iNDC. Final Report to MINAM.

[47] FIP Investment Plan for Peru, Climate Investment Fund FIP/SC 11/4, October 2013.

[48] Ibid.

[49] MINAM (2015). Programa Nacional de Conservación de Bosques para la Mitigación del Cambio Climático.

agricultural use. The latter is a major source of non-sustainability. Medium- and large-scale agriculture often tends toward monoculture (such as oil palm plantations).

Timber and non-timber harvesting: This group, which includes small-scale loggers, indigenous communities, concessionaires of non-timber products, and lumber companies, is the main source of forest biomass and carbon stocks, i.e. forest degradation[50]. In general, productivity of these operations is based on antiquated equipment and is low and inefficient. The timber produced is mainly consumed on the domestic market since Peru exports relatively little timber. The majority of the timber is from a limited number of species.

Illicit activities: Illicit activities mainly refer to coca cultivation and informal mining and occur in areas where rights and the governmental presence are weak. These activities can be locally important (e.g., gold mining in the region of Madre de Dios) and may be a source of capital for licit activities (e.g., cocoa) due to the limited availability of credit.

Indirect drivers of deforestation: The broad array of underlying causes of deforestation can be classified into:

a) social factors, connected primarily with population growth, poverty and social exclusion both within the Amazon as well as in other regions that expel migrants to the Amazon;
b) economic factors, including the low profitability of forest activities compared to other land uses, little or no access to markets for forest goods and services, the lack of appropriate financial instruments and/or access to credit, the growing demand for products from land uses that compete with forest activities (like agro-fuels or industrial crops), and land speculation; and
c) institutional factors, such as public policies and natural resource management based on uncoordinated and non-territorial sectorial approaches, contradictory or incoherent policies, the absence of land use planning, insecure land tenure, limited institutional capacity, the low level of monitoring, control, and sanctions of inappropriate land use, and the imperfect and incomplete allocation of rights to forest lands.

4.3 TARGETING NEEDS FOR SUSTAINABLE LANDSCAPES AND CLIMATE CHANGE

While AFOLU is the most important source of GHG emissions in Peru, it also holds the most promise for reducing emissions in a cost effective manner. An analysis of marginal abatement cost curves for 77 mitigation measures found that AFOLU mitigation measures can reduce a large amount of emissions in Peru at a relatively low cost.[51] Peru's Intended Nationally Determined Contribution (INDC) estimated that AFOLU mitigation measures account for 70percent (57.6 million tCO_{2e}/yr.) of the total emission reductions in 2030.[52] Priority mitigation measures and their related expected emissions reductions are shown in Table 1 based on levels of ambition in Table 2Table 2.

---

[50] FIP Investment Plan for Peru, Climate Investment Fund FIP/SC 11/4, October 2013.

[51] Curva de Costo Marginal de Mitigación, MACC, Proyecto Planificación ante el Cambio Climático. Available at http://www.planccperu.org/IMG/pdf/curva_macc.pdf

[52] MINAM, June 2015. Construyendo Participativamente la Contribución Nacional: Propuesta del Perú (INDC) para Consulta Pública. Available at http://www.minam.gob.pe/wp-content/uploads/2015/06/contribucion-iNDC21.pdf

Table 1: Expected GHG Emissions Reductions Associated with Mitigation Measures of the AFOLU Sector, Peru

Mitigation Measure	Expected reductions in 2030 (Mt CO2eq)
Sustainable forest management in forest concessions	12.15
Community forestry management	0.69
Forest conservation via incentive programs	3.43
Improved protection of natural protected areas	1.55
Reforestation	8.35
Sustainable coffee agroforestry	4.90
Sustainable cocoa agroforestry	2.36
Enabling conditions related to land use planning, monitoring, control, and enforcement	24.16
Total	**57.59**

Source: L. Limachi, L. Szott, and G. Solano (2015).[53]

Table 2: Levels of Ambition by Type of Mitigation Measures in AFOLU, Peru

Mitigation Measure	Level of Ambition (1000 ha)
Avoided deforestation	1,042
Reforestation	450
Sustainable agroforestry	145
Enabling conditions related to land use	20,600

Source: L. Limachi, L. Szott, and G. Solano (2015).[54]

4.4 GREEN BONDS FOR SUSTAINABLE LANDSCAPES IN PERU

Many mitigation measures for SL have a positive net present value of benefits, especially for reforestation, coffee and cacao agroforestry, and sustainable forest management. The relatively low level of spontaneous adoption of these measures, despite their profitability, is due to technical, legal, institutional, and financial barriers associated with the implementation of these systems. These include the need for specialized knowledge, access to improved planting material, insecure land tenure, high costs of investments in equipment and inputs, long periods of risk, high up-front costs, and long waiting periods for returns.

Other measures, however, have net positive costs that are disincentives for their adoption by the private sector actors in the absence of public financing or international cooperation. These include the

[53] L. Limachi, L. Szott, and G. Solano (2015). Propuesta tecnica actualizada de contribución del sector uscuss al indc. Final Report to MINAM.

[54] Ibid.

consolidation of protected natural areas, subsidized indigenous community forestry, Brazil nut management, and enabling conditions related to land use, including land titling, and land use zoning, monitoring, and control. In the latter case, it should be noted that the establishment of these conditions is important not only for their direct impact on the reduction of deforestation (as shown in the case of Brazil where similar measures, but especially land use enforcement, have been key in drastically reducing deforestation rates), but enable and increase the effectiveness of the other mitigation measures.

In short, investments in green public and private infrastructure are needed to improve the productivity and sustainability of potentially profitable systems, but are limited by the availability of capital and appropriate financial instruments. It has been argued that the lack of access to capital under favorable conditions is a major driver of deforestation and illicit activities (e.g. coca production and illegal logging) and a principal obstacle to the adoption of mitigation measures. In this sense, reforestation, coffee and cacao agroforestry, and sustainable forest management projects, which also aid both mitigation and adaptation to climate change, would be suitable targets for green bonds. Other target activities could include the greening of agroexport production, especially on the Peruvian coast.

Table 3 suggests that investment needs are large, even for productive activities alone. This implies that appropriate financial instruments that help in increasing the availability of capital, decreasing its costs, and defraying risk could have a substantial impact on increasing agricultural and forestry production while reducing deforestation.

Table 3: Marginal Economic Analysis of Mitigation Measures for the AFOLU Sector, Peru

Mitigation Measure	NPV BAU	NPV with Mitigation	Net Cost of Mitigation	Marginal Investment Cost
	Millions $			
Enabling conditions	0.0	-1,183.1	1,183.1	1,183.1
Sustainable forest management	260.8	317.7	-56.9	96.9
Community forestry managment	17.5	50.1	-32.5	13.6
Forest conservation based on incentives	32.3	-73.9	106.3	76.8
Protection of protected natural areas	-54.7	-171.6	116.9	116.9
Reforestation	0.0	181.2	-181.2	1,521
Sustainable coffee agroforestry	0.0	87.4	-87.4	1,014.4
Sustainable cocoa agroforestry	0.0	20.5	-20.5	684.7
TOTAL				**4,710.4**

Source: L. Szott, 2015. [55]

[55] L. Szott, 2015. Evaluación y determinación de los costos de las opciones de mitigación de emisión de gases de efecto invernadero del sector forestal consideradas en la propuesta de la contribución prevista y determinada a nivel nacional. Final technical report to MINAM.

4.5 STRUCTURING OF GREEN BONDS

Interest in green bonds for sustainable landscapes in Peru is incipient. AgroBanco, the state-run agricultural development bank, has a small portfolio related to sustainable forest management. It has considered options for greening its credit policies, such as restricting agricultural credit for activities that result in deforestation. It is presently evaluating financing reforestation. Interbank is a major player in agricultural financing, mainly on the coast, and has also started to green its operations. Nevertheless, the potential of green credit from commercial banks for sustainable landscapes is judged to be low due to the high rates of interest (on the order of 20 percent annually by Agrobanco and up to 40 percent annually from commercial banks) and types of guarantees required, which are not well-suited for small and medium-sized businesses and farmers in Peru.

Discussions have also been held between Forest Trends and MDA as to how to develop green bonds and a private green investment fund in Peru. Foundations such as Althelia are presently financing sustainable forestry/agroforestry development projects in Madre de Dios and Cordillera Azul and the Moringa Foundation has various projects in the pipeline. Root Capital and Rabobank offer credit for short-term working capital for agriculture (e.g., coffee and cocoa as well as some coastal agriculture), rather than long-term investments.

The design of green bonds needs to account for the characteristics of the major actors in agricultural and forestry production (small and medium-sized businesses and small farmers), as well as opportunities presented by international cooperation and the Peruvian government.

Most agroforestry, reforestation, and forestry activities have relatively high costs. The per-hectare costs range from $3,000 - $5,000 for coffee and cocoa establishment[56] to $6,000 - $15,000 for reforestation (depending on harvesting costs and the products sold). Equipment costs and operating cash flow requirements are high for timber production.[57] Agroforestry and reforestation present additional complications since the majority of investments are up-front, mainly during the first three years, production and revenue lags are long (2-3 years for coffee and cacao and 8-15 years for timber), and biotic, economic, and social and political risks are high due to the long time production cycle.

As a result, financing mechanisms for these investments should emphasize start-up costs and risk reduction. The transaction costs of providing financing and technical assistance to small-scale businesses and farmers are also high, and thus "incubator" approaches could be successful.

Given these characteristics, the investment vehicle will probably be based on public-private partnerships that include the Peruvian government or international cooperation as a guarantors in order to reduce risk, and multi-lateral banks (e.g., CAF) or Peruvian national development finance corporations (e.g., COFIDE) as bond issuers. Guarantees could also be offered directly by businesses or farmers via capital stock or flows (e.g., forest plantations present, cash flow from gold sales). In the majority of the cases, guarantees associated with these investments may need to be provided by the GoP (whose bonds are currently rated as investment grade) and/or by bilateral or multilateral donors or development banks (include the USAID DCA). Under a government guarantee, the Peruvian government could operate under a "first in, last out" de-risking policy that would help enable private capital investments.

---

[56] Alianza Cacao Peru (2014). Plan de negocios para el fondo agroforestal Moringa.

[57] L. Szott (2014). Unpublished data.

International cooperation could also provide technical assistance related to building technical and organizational capacities needed to use capital effectively. Diversification can also reduce risk, for example by combining different types, sizes, or locations of projects into a larger investment package.

Potential bond issuers include multilateral development banks (CAF, IBD, etc.) or the Peruvian Development Finance Corporation (COFIDE). However, subnational (regional and municipal) governments in Peru are excluded by law from issuing bonds. Bond issuers need to commit to structuring products focused on the sustainable transformation of productive chains.

It should be noted that capital raised from the issue of green bonds could be combined with results-based payments for emission reductions; the latter could be used to subsidize interest payments and accordingly reduce the costs of capital for agricultural or forestry activities, and would extend the potential impact of green bonds.

Although these bonds would help reduce GHG emissions from the principal contributor (AFOLU) at the national level, their design and implementation face some major challenges:

- Greater analysis of the agricultural and forestry projects is needed in order to better quantify associated risks and inform the structuring of project portfolios.
- Emerging green bond standards need to be adapted and applied to potential and existing projects.
- Public and/or private sources of funding of pre-investments need to be identified.
- Project monitoring systems need to be established.
- Relationships among potential actors need to be worked out.
- Finally, key actors (e.g., commodity buyers, municipalities) who would subsequently drive changes towards more sustainable production at the individual producer level need to be identified. In Brazil, large commodity buyers are beginning to adopt deforestation-free supply chains, and have a large influence on deforestation and sustainable production practices. By contrast, the commercialization of agriculture and forestry in Peru is much more atomized. However, investments in green infrastructure for sustainable landscapes might not yield the desired outcomes if there is no clear signal from buyers of commodities regarding the sustainability of productive practices.

4.6 EXAMPLES OF CURRENT INVESTMENT NEEDS

Concrete examples of the financial needs of medium-sized agricultural and forestry projects are shown in Table 4 below and are based on a rapid, informal survey.[58]

[58] L. Szott (2015). Unpublished data.

Table 4: Examples of Sustainable Forestry and Agriculture Investment Needs

Business/Project	Purpose	Need
Green Gold - Iquitos	Sustainable forest management, low impact logging, and wood processing	$16 million
Tahuamanu forestry consortium – Madre de Dios	Sustainable forest management, low impact logging, and wood processing	$50 million
Community forestry management (Belgica and Puerto Esperanza)	Sustainable forest management	$2 million
Reforestation (approximately 5-6 businesses)	Expansion of forestry plantations (approximately 15,000 ha)	$75 million
Allianza Cacao	Expand sustainable and green cocoa production ono 4000 ha	$7.8 million
Coffee renovation with high quality, rust-resistent varieties	Renovate approximately 80,000 ha	$333 million
"Green" gold mining without use of mercury and with compensation for environmental impacts	Reforestation to compensate impacts of alluvial gold mining in the Huehuetepe area of Madre de Dios	$60 million
"Greening" of operations for medium-scale agroexports along the coast	Grapes, avocados, berries, asparagus	$10-$15 million

5. CLEAN ENERGY OVERVIEW AND BONDS IN PERU

5.1 OVERVIEW

High rates of economic growth in Peru have led to a substantial increase in energy demand, creating new opportunities to invest in energy infrastructure. The Ministry of Energy and Mines (MINEM) has calculated that electricity demand will grow at an average annual rate of 8.8 percent per year up to the year 2017. In order to keep up with these increasing energy needs, Peru has to step up investment in electricity generation be more than US$5 billion by 2016. These investments are expected to bring an additional capacity of 4,300 MW, including 1,400 MW of hydro and 600 MW non-hydro renewables.[59] Peru's current renewable energy generation capacity of 4,086 MW[60] is largely dominated by hydropower, with wind energy second and solar energy third.[61]

Agencies with renewable energy involvement in Peru include the *Ministerio de Energia y Minas* (Ministry of Energy and Mines, MEM) and the O*rganismo Supervisor de la Inversion en Energia y Mineria* (OSINERGMIN) (Supervising Agency for Investment in Energy and Mining) for energy market regulation.

In terms of rural electrification, Peru has made remarkable efforts to improve its electrification rate. The national electrification rate has increased from 55 percent in 1993 to 87.2 percent in 2012. The National Rural Electrification Plan 2013-2022 provides strategic direction to provide access to electricity to 6.2 million people in the next 10 years. Peru is undertaking efforts to increase access to energy via auctions for solar photovoltaic systems, grid extension, mini-grids with hydro, solar, and wind.[62]

5.2 CLEAN ENERGY POLICY

Peru has taken ground-breaking steps in the development of renewable energy auctions. It has been one of the pioneers in the region in implementing renewable energy auctions. Renewable energy auctions have been one of the key drivers of renewable deployment in Peru, helping to promote diversification of the country's energy mix by expanding small-scale hydro, solar, biomass, and wind power. The country also features a modest clean energy generation target (see REPS below) which was pending revision and a biofuel blending mandate.

---

[59] IRENA. Peru Renewables Readiness Assessment 2014. Available at http://www.irena.org/DocumentDownloads/Publications/RRA_Peru.pdf

[60] 2014 data

[61] Bloomberg New Energy Finance (BNEF), Country Ranking Tool, https://www.bnef.com/insight/12669.

[62] IRENA. Peru Renewables Readiness Assessment 2014. Available at http://www.irena.org/DocumentDownloads/Publications/RRA_Peru.pdf

Renewable Energy Auctions[63]

The country's relatively low electricity prices (25.24 $/MWh wholesale, 78 $/MWh industrial, 117 $/MWh industrial, 150 $/MWh residential, and 115 $/MWh retail as of 2014; lower than Chile's and Colombia's)[64] [65] mean that the market for renewables is dependent on government-driven renewable energy auctions. In 2008, the Peruvian government established auctions to contract electricity generated from renewable sources from new developers as a key tool to increase the share of renewable energy generation in the country's energy matrix. Contracts are awarded to renewable energy developers who offer the lowest tariff per kWh for a given technology. Renewable energy prices are guaranteed for 20 years. OSINERGMIN is in charge of planning and executing the auction, according to the guidelines established by MEM.

> Process: In each auction, the Ministry of Energy and Mines defines the proportional participation of each type of technology, considering the National Renewable Energy Plan and the energy policy. The amount of renewable energy generation contracted for each technology is decided according to the Peru Renewable Energy Portfolio Standard, created under Legislative Decree No. 1002 from 2008.
>
> Status: The first two renewable energy auctions in 2011 awarded almost 1,400 GWh/year of renewable power from solar, wind and biomass and 281 MW from small hydro, attracting total investments of almost $1.5 billion.[66]

On August 2013, energy regulator OSINERGMIN called for an auction requesting renewable energy generation from biomass from agroindustrial waste (320 GWh/year) and small hydro (up to total of 1,300 GWh/year). Among the 24 offers submitted in the auction, only one biomass project was presented, but it did not meet the OSINERGMIN's requirements. On December 2013, OSINERGMIN announced the auction winners were 19 small-scale hydropower projects. The offers together did not reach the generation target of 1,300 GWh/year. In total, potential generation acquired will reach 1,278.06 GWh/year, sold at an average price of US$56.55/MWh.[67]

That same year, Peru announced its first off-grid renewable energy auction, which was completed in 2014, and which sought PV systems to expand electricity coverage to 500,000 users in rural and isolated areas of the country.[68]

On September 2015, the energy regulator, OSINERGMIN, called for an auction requesting renewable energy generation from:

- Biomass from agroindustrial waste (up to total of 125 GWh/year);
- Biomass from forestry residues (up to total of 125 GWh/year);

---

[63] BNEF, Peru country profile, https://www.bnef.com/core/country-profiles/per

[64] BNEF, Power Prices: Latin America and Caribbean 2006-14. Available at https://www.bnef.com/Insight/10836?fromGlobalSearch=3037293001

[65] BNEF, "H1 2015 South America Market Outlook", 30 Jun 2015. Lilian Alves. https://www.bnef.com/Insight/12437?fromGlobalSearch=2925261011

[66] IRENA. Peru Renewables Readiness Assessment 2014. Available at http://www.irena.org/DocumentDownloads/Publications/RRA_Peru.pdf

[67] BNEF, Peru 3rd Renewable Energy Auction. Available at https://www.bnef.com/Policy/3809/

[68] BNEF, Peru 1st Off-grid Renewable Energy Auction. Available at https://www.bnef.com/Policy/3815/.

- Biomass from municipal solid waste-incineration (up to total of 31 GWh/year);
- Biomass from municipal solid waste-landfill gas (up to total of 31 GWh/year)
- Wind (up to total of 573 GWh/year);
- Solar PV (up to total of 415 GWh/year)
- Small hydro =< 20 MW (up to total of 450 GWh/year).[69]

These auction processes have successfully demonstrated that an auction-based mechanism can be utilized for transparent and efficient procurement of renewable energy, securing Peru's participation in the global renewable energy market and contracting significant quantities of renewable electricity at competitive prices.[70]

Renewable Energy Portfolio Standard (REPS)

The Renewable Energy Portfolio Standard requires a percentage of national electricity consumption to be sourced from renewable energy sources. In the first five years (2008-2013) the requirement was set at 5 percent. It will be revised every five years.[71]

Accelerated Depreciation Benefit Tax Incentive

Published on June 30, 2008, this decree allows for accelerated depreciation of up to 20 percent of investments in machinery and equipment used for renewable energy generation incurred as income tax.[72]

5.3 CLEAN ENERGY SECTOR FINANCING

South American Context

Since 2013, most clean energy activity in South America has occurred in Chile and Uruguay (see Figure). Peru appears to be making progress toward re-igniting investment.

---

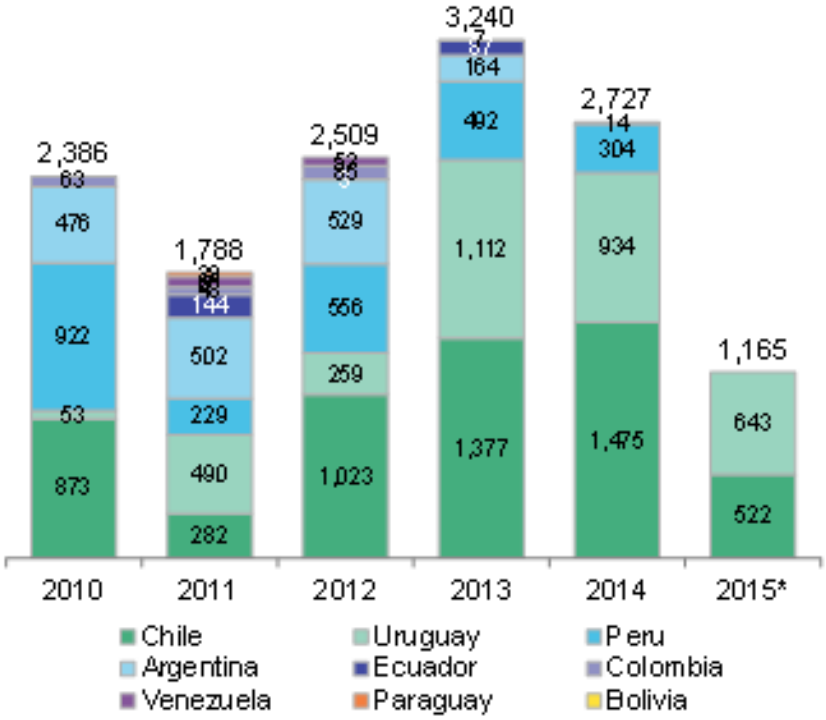
[69] BNEF, Peru 4th Renewable Energy Auction. Available at https://www.bnef.com/Policy/4434/

[70] IRENA. Peru Renewables Readiness Assessment 2014. Available at http://www.irena.org/DocumentDownloads/Publications/RRA_Peru.pdf

[71] BNEF, Peru country profile, https://www.bnef.com/core/country-profiles/per.

[72] Ibid

Figure 3: New Clean Energy Investment by Country, 2010-2015 ($M)[73] [74]



Peru

Climatescope 2014 placed Peru 12th globally for the Clean Energy Investment and Climate Financing parameter.[75] From 2006 to 2013, Peru attracted $3.4 billion in clean energy investments primarily a mix of wind and solar.[76] Solar, which saw more than $400 million invested in 2011 and 2012, is awaiting opportunities in off-grid and in future auctions. Investment for all new build renewable energy technologies in Peru amounted to $264.7 million for the 2014 year. The largest sum went into onshore wind ($185 million), followed by solar PV ($57.1 million), and followed by small hydro ($22.6 million).[77]

---

[73] BNEF, "H1 2015 South America Market Outlook", 30 Jun 2015. Lilian Alves. https://www.bnef.com/Insight/12437?fromGlobalSearch=2925261011

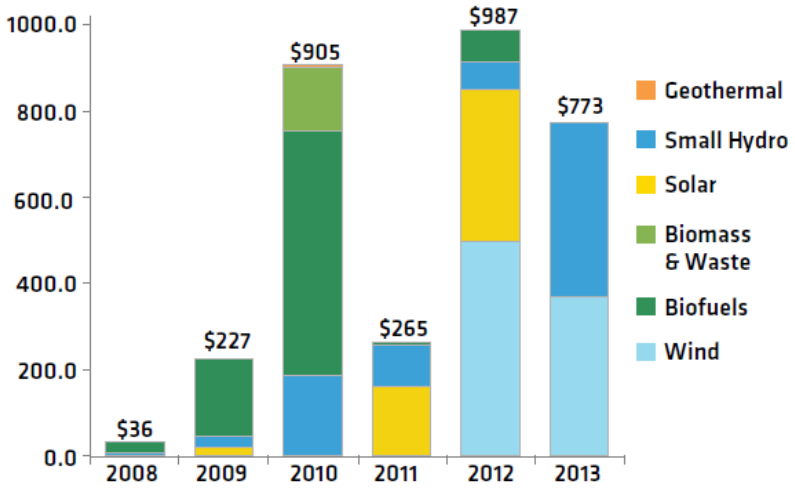
[74] Excludes large-scale hydropower.

[75] BNEF. Climatescope 2014. Available at http://global-climatescope.org/en/download/reports/countries/climatescope-2014-pe-en.pdf

[76] http://www.bloomberg.com/news/articles/2014-11-17/peru-to-unveil-plans-for-renewable-power-auction-during-un-talks. Peru to Unveil Plans for Renewable Power Auction During UN Talks. Vanessa Dezem. November 17, 2014

[77] BNEF, Country Ranking Tool, https://www.bnef.com/insight/12669.

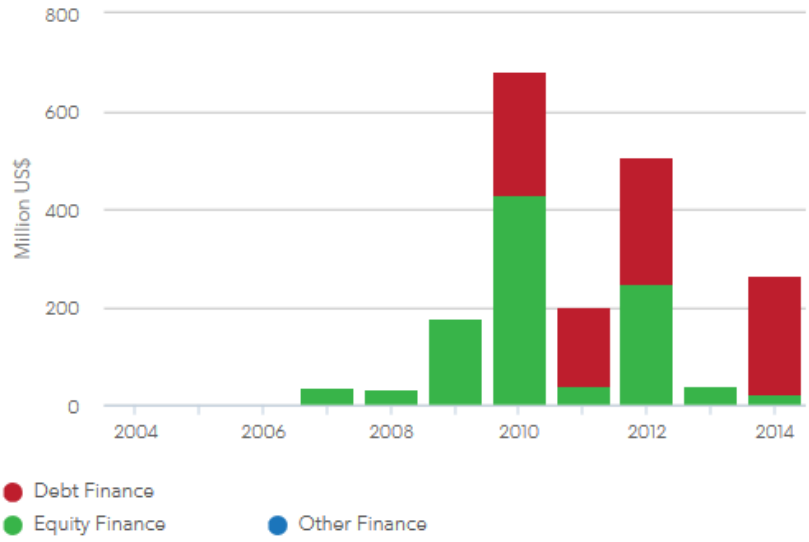
Figure 4: Annual Investment in Clean Energy in Peru, 2008 - 2013 ($million)[78]



Source: Bloomberg New Energy Finance
Notes: Total investment includes: Asset Finance, Corporate Finance and Venture Capital / Private Equity Commitments.

Figure 5 below provides a breakdown of asset financing in Peru by debt, equity and other type of finance, with debt largely accounting for financing in 2014.

Figure 5: New Build Renewable Asset Finance by Type in Peru, Disclosed Deals Only[79]

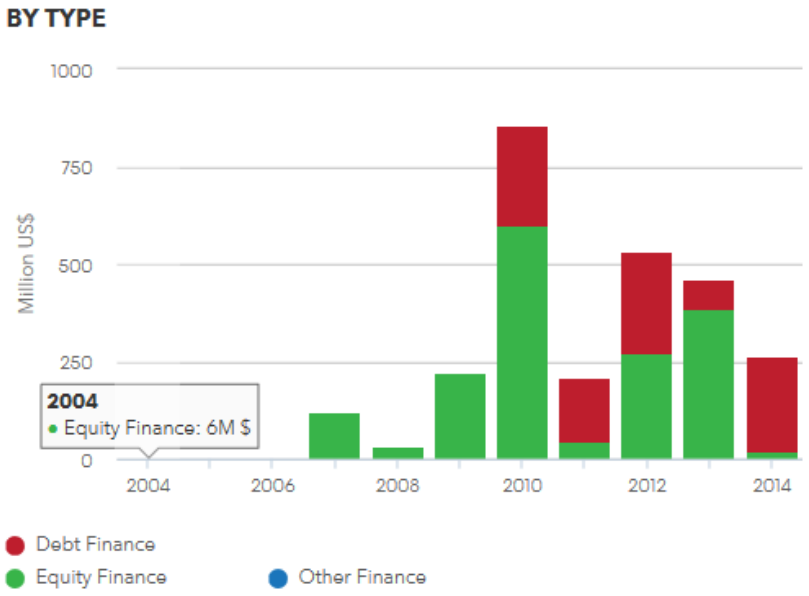


[78] BNEF. Climatescope 2014. Available at http://global-climatescope.org/en/download/reports/countries/climatescope-2014-pe-en.pdf

[79] Ibid

Including estimates of undisclosed deals, the most noticeable differences are an increase in financing of approximately $175 million in 2010, and approximately $400 million in 2013 most in equity financing.

Figure 6: New Build Renewable Asset Finance by Type in Peru, Including BNEF Estimates for Undisclosed Deals[80]



The following two tables list the top renewable energy finance lenders between 2005 and Q2 of 2015, specifically for projects in Peru. From the list of lenders, Intercorp Peru Ltd is the only domestic lender.

[80] Ibid

Table 5: Top Renewable Energy Project Finance Lenders ($M), 2005 - Q2 2015[81]

Overseas Private Investment Corp	515.7
Corp Andina de Fomento	164.1
Inter-American Development Bank	130.3
Natixis SA	127.0
Goldman Sachs Group Inc/The	102.0
Bank of America Corp	102.0
Agence Francaise de Developpement	69.0
Intercorp Peru Ltd	54.6
Export-Import Bank of the United States	51.5
Deutsche Bank AG	47.5

Table 6: Top Renewable Energy Asset Owners (MW), 2005 - Q2 2015[82]

ContourGlobal LP	114
Latin America Power	71
ACS Actividades de Construccion y Servicios SA	32
Solarpack Corp Tecnologica SL	26
Paramonga Agro Industrial Saa	23
Grupo Isolux Corsan SA	22
Duke Energy Corp	16
Aguas y Energia Peru SA	13
Sindicato Energetico SA	10
Conduit Capital Partners LLC	10

Three of the above asset owners are Peruvian entities. Paramonga Agro Industrial Saa is a sugar producer using bagasse and straw to produce energy, Aguas y Energia Peru SA and Sindicato Energetico SA are small-scale hydropower developers.

---

[81] Ibid

[82] Ibid

Finance barriers in Peru

A renewables readiness assessment conducted by IRENA in 2014 identified the challenges and barriers for renewables in Peru shown in Table 7 below:[83]

Table 7: Challenges for Renewables in Peru and Recommended Actions to Address Them

	Current situation (includes good practice areas) Challenges/problems to be solved Capacity-building needs	Recommended Action(s)
Business model	Lack of ability to evaluate projects for the financial system; very few bankable projects submitted to date	Develop user guide that provides investing promoters with necessary requirements for making loan applications
Policies and strategies	Lack of capacity of relevant institutions to assess renewable energy projects; funding for new opportunities lost	Build capacities to utilize renewable energy business model or chain *e.g.,* technology transfer through universities and R&D think tanks
Institutions, regulations and market structure	Lack of clarity in project management for compliance with renewable energy project requirements *e.g.,* environmental evaluations, environmental impact assessments, leading to financial proposal rejections	Build capacities to enforce compliance with renewable energy projects
Resources, technologies and infrastructure	Inventory system for licensing or cross-sector concessions are emerging, causing delays in renewable energy project implementation	Create integrated information system for areas of interest
Funding, construction, operation and maintenance	Lack of knowledge of innovative finance that can improve renewable energy projects	Finance hire-purchase option model to provide better terms for credit to promoters; suggested model adopted by CAF in other countries

5.4 GREEN BONDS FOR CLEAN ENERGY

Peru has already had some initial success in the issuance of green bonds. The International Finance Corporation (IFC) issued the first green bond on the Peruvian market, raising PEN 42 million ($15.1 million).[84] This 20 year bond had an implied yield of 5.3 percent and was designed for a domestic insurance company, RIMAC Seguros, investing in clean energy projects. The inclusion criteria were reviewed by the Center for International Climate and Environmental Research, a research center established by the Norwegian government.[85]

---

[83] IRENA. Peru Renewables Readiness Assessment 2014. Available at http://www.irena.org/DocumentDownloads/Publications/RRA_Peru.pdf

[84] Aii Data Processing L. IFC issues USD-15m green bond in Peru. SeeNews Renewables [serial online]. August 13, 2014: Available from: Business Source Corporate Plus, Ipswich, MA.

[85] Kidney, Sean. "IFC Issues First Peruvian Soles-denominated PEN 42m ($15m) Green Bond, for Domestic Investor RIMAC Seguros, AAA, 20yr. A Fantastic Kick-start for a Domestic Green Bond Market in Peru?" Climate Bonds Initiative, 14 Aug. 2015. Web. 16 Mar. 2015. <http%3A%2F%2Fwww.climatebonds.net%2F2014%2F08%2Fifc-issues-first-peruvian-soles-denominated-pen-42m-15m-green-bond-domestic-investor-rimac>.

The second green bond in Peru was by Energia Eolica SA (Contour Global) for construction of two wind projects (81 MW Cupisnique and 31 MW Talara). This $204 million bond had a coupon yield of 6 percent per annum and 20-year tenor. Bank of America, Merrill Lynch, and Goldman Sachs structured the bonds and acted as joint book-runners. [86] These wind farms have a 20-year guaranteed power purchase agreement. Peruvian pension funds and insurance companies made up more than 80 percent of the order book.[87] Peruvian investors were more familiar with the country's economy and had less concern for size – critical given that international buyers demand a premium for less liquid transactions.[88] Once the risky construction phase is completed, institutional investors are expected to be more interested.[89]

5.5 RENEWABLE ENERGY ASSET AND RESOURCE MAPS[90]

Most power plants are located in the center of Peru, where historically most of the electricity demand was concentrated. However, in recent years, electricity demand has been growing quite rapidly in the north and south of the country, as these two regions are increasingly becoming the new poles of development. New generation and transmission capacity is being built to cover the increasing regional electricity demand. Transmission lines could be also further developed to integrate Peru with neighboring countries, as there is potential for regional electricity trade. Peru has an electrical interconnector with Ecuador, and in the future could also extend an interconnection to Brazil.[91]

Error! Reference source not found.7 is a map of renewable energy projects in Peru at various stages of development, from planning to construction to commissioning. Most solar power plants are located in the southern part of the country which has the highest average solar irradiance. Wind power plants are located along the Peruvian coast. Hydro power plants are scattered in the highlands, west of the Amazon basin.

---

[86] BNEF, "H1 2015 South America Market Outlook", 30 Jun 2015. Lilian Alves. https://www.bnef.com/Insight/12437?fromGlobalSearch=2925261011

[87] "Energia Eolica Brings Dawn to LatAm Green Bond Market." LatinFinance, 17 Dec. 2014. Web. 16 Mar. 2015. <http://www.latinfinance.com/Article/3411361/Energia-Eolica-brings-dawn-to-LatAm-green-bond-market.html#.VQdDyo54qfY>.

[88] Ibid

[89] Kidney, Sean. "Peru's First Domestic Green Bond from Energia Eolica; $204m, 6%, 20y, BBB-." Climate Bonds Initiative, 1 Jan. 2015. Web. 16 Mar. 2015. <http%3A%2F%2Fwww.climatebonds.net%2F2014%2F12%2Flast-reviews-year-peru%25E2%2580%2599s-energia-eolica-204m-and-norway%25E2%2580%2599s-vardar-41m-are-new-issuers-swedish>.

[90] BNEF, Peru country profile, https://www.bnef.com/core/country-profiles/per

[91] IRENA. Peru Renewables Readiness Assessment 2014. Available at http://www.irena.org/DocumentDownloads/Publications/RRA_Peru.pdf

Figure 7: Geographical Distribution of Renewable Energy Power Plants, by Technology (Including Under Planning, in Construction, and Commissioned)

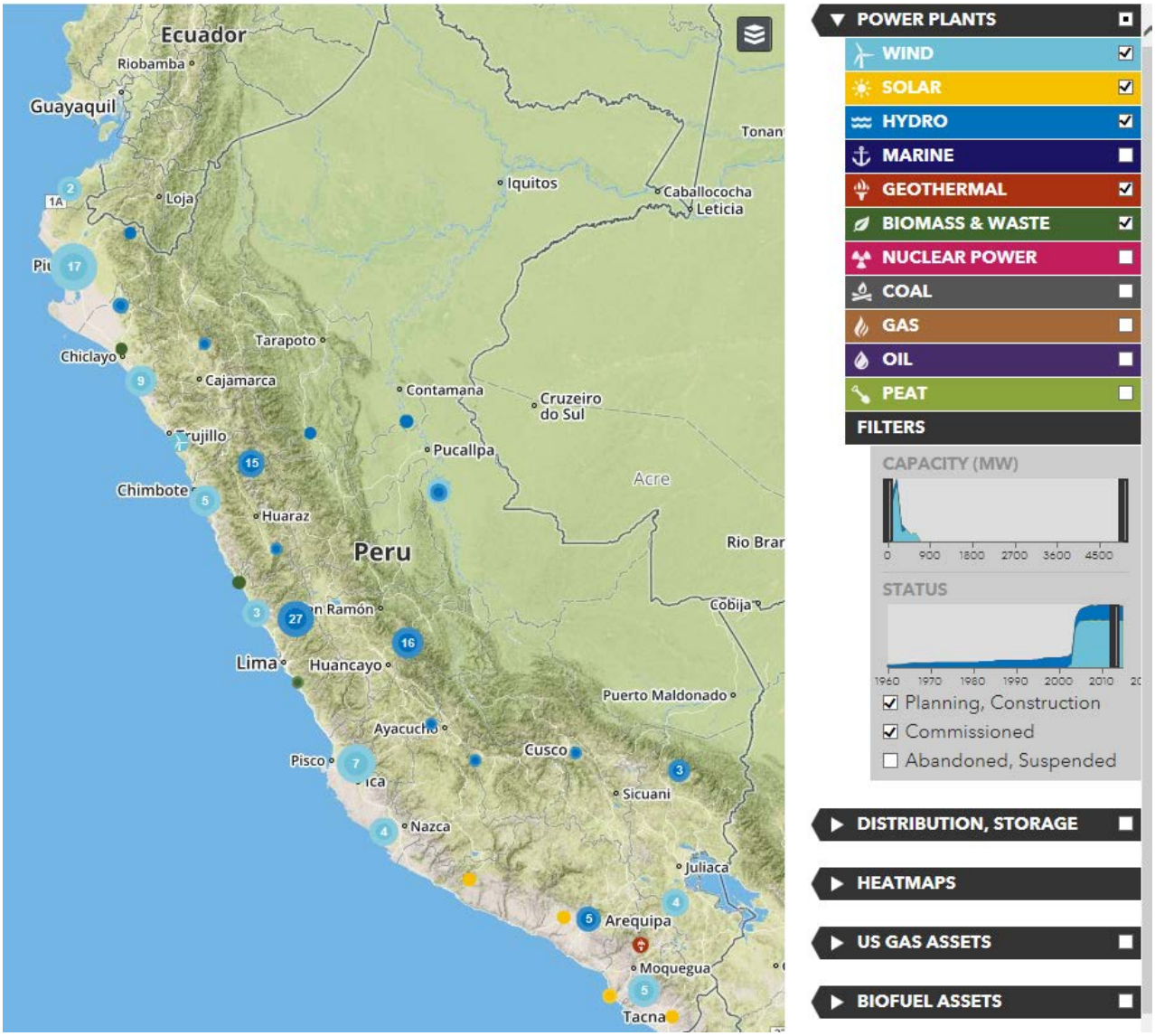


Figure 8: Wind Speed Map and Location of Wind Power Plants, with Darker Areas Indicating Higher Average Wind Speeds

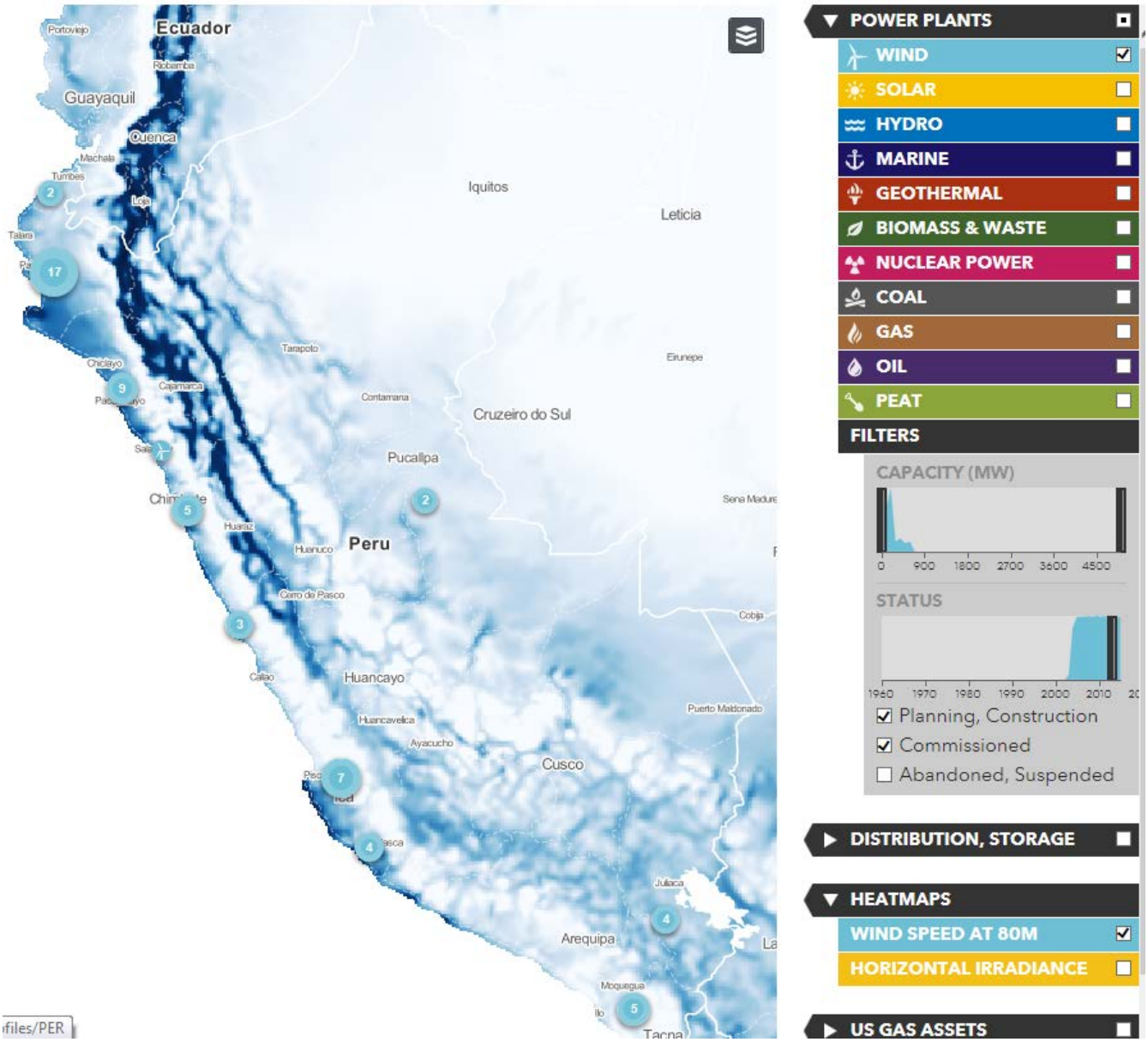
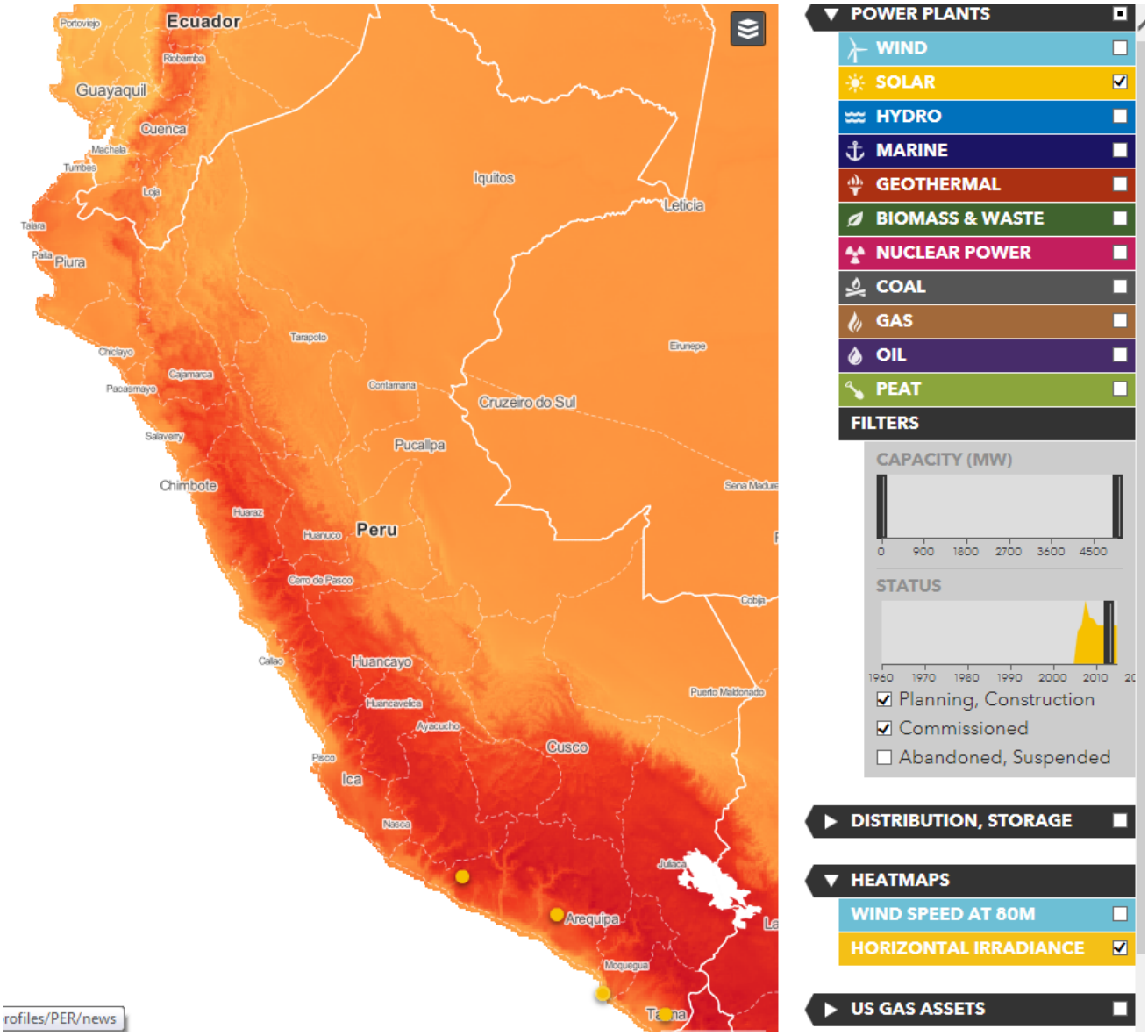


Figure 9: Solar Irradiance and Location of Solar Power Plants, with Darker Areas Reflecting the Highest Solar Resources



6. CLIMATE-FRIENDLY INFRASTRUCTURE IN THE CONTEXT OF PERU'S INDC AND NAMAs

6.1 PERU'S INTENDED NATIONALLY DETERMINED CONTRIBUTION (INDC)

Peru submitted its INDC to the UNFCCC in September 2015. Through this communication, Peru envisages a reduction of greenhouse gas (GHG) emissions equivalent to 30 percent in relation to the GHG emissions of the projected Business as Usual scenario (BaU) in 2030, and with 2010 as the baseline year.

Peru considers that a 20 percent reduction will be implemented through domestic investment and expenses, from public and private resources (non-conditional proposal), and the remaining 10 percent is subject to the availability of international financing and the existence of favorable conditions (conditional proposal).[92]

Peru's September 2015 INDC submission does not actually detail emission reductions by sector, nor does it provide strategies to achieve such reductions. However, this information can be found in an earlier version of Peru's INDC document, dated June 2015 and released for public consultation.[93]

This document lays out four emissions scenarios through 2030, varying in levels of ambition. Scenario 3 is proposed for adoption, which includes 58 mitigation options or projects, which account for GHG emissions reductions of 82.2 million TCO_{2eq}, and represents 31 percent emission reductions by 2030 relative to the BaU scenario. This is the scenario that Peru committed to in its official INDC submission dated September 2015.

The 58 mitigation options or projects identified are shown in Table 8 below. More than 50 percent of these are under way.

[92] MINAM, September 2015. Contribución Prevista y Determinada a Nivel Nacional (INDC) de la República de Perú. Available at http://www.minam.gob.pe/wp-content/uploads/2015/09/ESPAÑOL.pdf

[93] MINAM, June 2015. Construyendo Participativamente la Contribución Nacional: Propuesta del Perú (INDC) para Consulta Pública. Available at http://www.minam.gob.pe/wp-content/uploads/2015/06/contribucion-iNDC21.pdf

Table 8: Mitigation Options Identified as Part of Scenario 3, Including Sector and Emission Reduction Potential

SECTOR	OPCIÓN DE MITIGACIÓN	MITIGACIÓN MT CO2EQ EN EL 2030
Energía	Combinación de Energías Renovables	3.570
Energía	Generación Distribuida con Paneles Solares	0.015
Energía	Electrificación Rural con Paneles Solares	0.013
Energía	Redes Eléctricas inteligentes (Smart Grid)	0.057
Energía	Interconexión Eléctrica con Ecuador	3.934
Energía	Reducción de Pérdidas en el SEIN	0.629
Energía	Cogeneración en Refinerías	0.025
Energía	Cogeneración en Industrias	0.161
Energía	Cogeneración en Servicios Hospitalarios	0.005
Energía	Calentadores Solares de Agua en Viviendas	0.044
Energía	Reemplazo de Motores por Antigüedad	0.020
Energía	Optimización de Motores (tecnología VSD)	0.078
Energía	Optimización de Calderas (buenas prácticas)	0.128
Energía	Reemplazo Calderas por Antigüedad	0.437
Energía	Reemplazo de Lámparas Incandescentes en Viviendas	0.006
Energía	Reemplazo de Lámparas Fluorescentes en Viviendas	0.011
Energía	Reemplazo de Lámparas Fluorescentes en sector comercial	0.059
Energía	Reemplazo de Luminarias en Alumbrado Público	0.056
Energía	Etiquetado en Eficiencia Energética en equipos y electrodomésticos	0.543
Energía	Eficiencia Energética en Ladrilleras Artesanales (NAMA)	0.730
Energía	Sistema de Gestión Integral de Energía en Industrias y Servicios	1.294
Transporte	Sistema Transporte Público Masivo: Corredor 2 (NAMA)	0.781
Transporte	Modernización de Vehículos de Transporte Público: Chatarreo (NAMA)	0.059
Transporte	GNL en reemplazo de diesel para transporte pesado por carretera	0.480
Transporte	GNV en Buses: conversión de motores y nuevas unidades	0.355
Transporte	GNV en Vehículos: conversión de motores y nuevas unidades	0.254
Transporte	Capacitación en Conducción Ecoeficiente	0.610
Transporte	Introducción de Buses y Camiones Eficientes	0.752
Transporte	Introducción de Vehículos Livianos Híbridos y Eléctricos	0.059
Transporte	Introducción de Vehículos a Gasolina Eficientes	0.743
Transporte	Sistema Integrado de Transporte (Líneas 2, 3 y 4 del Metro de Lima)	0.340

Procesos Ind	Reemplazo de Clinker por Puzolana en el Cemento	1.577
Procesos Ind	Reemplazo de Clinker por Escoria Siderúrgica en el Cemento	0.777
Procesos Ind	Reemplazo de Clinker por Filler Calizo en el Cemento	0.877
Procesos Ind	Sustitución de Carbón por Gas Natural en Hornos de Cemento	0.905
Procesos Ind	Sustitución de Carbón por Gas Natural en Hornos de Hierro y Acero	0.260
Agricultura	Manejo de Pastos Naturales en Sierra	0.180
Agricultura	Sistema Silvopastoril para Evitar Deforestación (NAMA)	0.560
Agricultura	Reconversión productiva de Arroz por Quinua en la Costa Norte	0.062
Agricultura	Recuperación de Pastos Degradados Pasturas mejoradas	0.370
Agricultura	Capacitación en Buenas Prácticas Pecuarias en Alpacas	0.011
Agricultura	Capacitación para Mejorar Rendimiento de Arroz en Costa	0.053
Agricultura	Sistema de Riego intermitente para el Arroz en Selva	0.211
Forestal	Manejo Forestal Sostenible (MFS) en Concesiones Forestales	6.112
Forestal	Reordenamiento del Bosque de Producción Permanente y MFS	6.046
Forestal	Conservación de Bosques y Transferencias Directas Condicionadas	3.431
Forestal	Manejo Forestal Comunitario	0.691
Forestal	Consolidación de Áreas Naturales Protegidas	1.551
Forestal	Condiciones Habilitantes: Ordenamiento Territorial, Control y Vigilancia, Asignación de Derechos	24.157
Forestal	Reforestación Comercial con Altos Rendimientos de Insumos	7.279
Forestal	Reforestación Comunal con Tecnología Media	1.069
Forestal	Sistema Agroforestal de Café (NAMA)	4.799
Forestal	Sistema Agroforestal de Cacao (NAMA)	2.359
Residuos	Captura y Quema de Metano en Rellenos Sanitarios (NAMA)	1.587
Residuos	Captura y Quema de Metano en Otros Rellenos Sanitarios	0.291
Residuos	Tecnología Semi Aeróbica en Rellenos Sanitarios (Proyecto BID/JICA)	0.473
Residuos	Compostaje en Rellenos Sanitarios (Proyecto BID/JICA)	0.217
Residuos	Reciclaje en Rellenos Sanitarios (Proyecto BID/JICA)	0.017

Given that the AFOLU sector is responsible for the bulk of Peru's GHG emissions,[94] it follows that AFOLU mitigation measures account for 70 percent (57.6 million TCO_{2eq}/yr) of the total emission reductions in 2030. Priority mitigation measures and their related expected emissions reductions are shown in Table 1 earlier in this document.

[94] MINAM, 2010. Segunda comunicación nacional del Perú a la Convención Marco de las Naciones Unidas sobre Cambio Climático 2010. Available at http://unfccc.int/resource/docs/natc/pernc2s.pdf

6.2 NATIONALLY APPROPRIATE MITIGATION ACTIONS (NAMAS)

As part of their commitment to mitigate climate change, developing country governments are proposing to implement, or already implementing, policies and actions known as NAMAs. It can be noted that several NAMAs are identified in Peru's proposed mitigation options or projects through 2030, as follows:

- Energy Efficiency in Brick Manufacturing (*Eficiencia Energética en Ladrilleras Artesanales*)
- Corridor 2 of Mass Public Transport System (*Sistema Transporte Público Masivo: Corredor 2*)
- Modernization of Public Transport vehicles: scrappage (*Modernización de Vehículos de Transporte Público: Chatarreo*)
- Silvipastoral System to Prevent Deforestation (*Sistema Silvopastoril para Evitar Deforestación*)
- Agroforestry System for Coffee (*Sistema Agroforestal de Café*)
- Agroforestry System for Cocoa (*Sistema Agroforestal de Cacao*)
- Landfill Methane Capture and Flaring (*Captura y Quema de Metano en Rellenos Sanitarios*)

In addition to the NAMAs that have been identified in the INDC, a few others appear to be in various stages of advancement, from conception to appraisal to development to implementation. These include:

- NAMAs in the energy supply sector and in different end use sectors,[95] composed of
    1. Business-as-usual GHG emission baseline
    2. Mitigation options for the energy generation and end-use sectors
    3. Design and implementation of NAMAs in the energy generation and end-use sectors
    4. MRV system and national registry for mitigation actions in the energy generation and end-use sectors
- Solid Waste Management[96]
- Sustainable urban transport,[97] contemplating
    - Finalization of Metro Line 1 and construction of Metro Line 2
    - Expansion of Transport Systems based on BRT in Lima.

---

[95] GEF, 2012. Project Identification Form: Nationally Appropriate Mitigation Actions in the Energy Generation and End-Use Sectors in Peru http://www.thegef.org/gef/sites/thegef.org/files/gef_prj_docs/GEFProjectDocuments/Climate%20Change/Peru%20-%20%284884%29%20-%20Nationally%20Appropriate%20Mitigation%20Actions%20in%20the%20E/PIMS%204679%20Peru%20NAMA%20PIF%20April%2013.pdf

[96] NAMA database. Available at http://www.nama-database.org/index.php/Solid_waste_programme. Accessed October 12, 2015

[97] GIZ. Peru – Sustainable Urban Transport. http://transport-namas.org/projects/transfer-partner-countries/peru/. Accessed October 12, 2015

    - Leverage the impact of the mass transit system via an improved integration of different transport modes along Metro Lines 1 and 2 and the BRT system "Metropolitano"
    - National Sustainable Urban Transport Program
    - Emission standards for light duty vehicles
    - Fleet optimization (buses, taxis): removal of high emission vehicles, introduction of more efficient vehicles (in fuel and size)

- NAMA for Agriculture "iNAMAzonia",[98] aimed at creating the enabling environment for sustainably intensified coffee, cocoa, livestock and oil palm production and to promote the ecological restoration of deforested degraded land in the Peruvian Amazon.
- Sustainable Housing and Construction Sector[99]
- Waste-to-energy in the agricultural sector,[100] which aims to:
    - Facilitate farmers' and agro-industries' access to capital to cover (up-front) investment costs of self-supply technologies and infrastructure for bioenergy generation from agricultural waste.
    - Build the capacity of beneficiaries of the NAMA program to establish, operate and maintain technologies and infrastructure to ensure their efficient and long-term use.
    - Promote the establishment of a waste-to-energy services and technology market in Peru.

Climate-friendly infrastructure projects are often embedded within these NAMAs, and most still lack financing mechanisms beyond their preparation phase, thus leaving room for private sector engagement and financing.

---

[98] World Agroforestry Centre. December 10, 2014. Peru launches its Nationally Appropriate Mitigation Actions (NAMAs) plan for agriculture. Available at http://blog.worldagroforestry.org/index.php/2014/12/10/peru-launches-its-nationally-appropriate-mitigation-actions-namas-plan-for-agriculture/

[99] Center for Clean Air Policy. May 2013. Peru - Sustainable Housing and Construction Sector NAMA. Available at http://ccap.org/assets/Peru_Housing_May_2013_NAMA_Executive_Summary.pdf

[100] Center for Clean Air Policy. May 2013. Peru - Scaling up Waste-to-Energy Activities in the Agricultural Sector - Proposal for a NAMA Programme. Available at http://ccap.org/assets/Peru_Waste_to_Energy_May_2013_NAMA_Executive_Summary.pdf

ANNEX A: TENTATIVE SCHEDULE OF MEETINGS

	Monday	Tuesday	Wednesday	Thursday	Friday	
8:30 AM					Apoyo Consulting (PPPs and Capital Markets)	
9:00 AM						
9:30 AM				Fitch Rating Agency		
10:00 AM		Deloitte (sub sovereign debt analysis)				
10:30 AM	USAID Kick off Meeting			CAF		
11:00 AM						
11:30 AM				FOGAPI	ProInversion (PPP Agency) (not confirmed)	Mecanismo Desarollo Alterno (MDA) / Forest Trends
12:00 PM						
12:30 PM		Ministry of Finance and Climate team				
1:00 PM	BID Kickoff Meeting					
1:30 PM			BBVA Bank- market experience in bonds			
2:00 PM				The Nature Conservancy, PARA AGUAS (Implementing partners with green infrastructure focus)		
2:30 PM		Ministry of Environment				
3:00 PM			COFIDE Peru Development Bank (possible issuer)		Mission Director Read Out	
3:30 PM						
4:00 PM				Superintendent of Banking and Pension Funds		
4:30 PM	Oscar Arrus (Garringues Firm) Attorney for Bonds		AgroBanco- reforestation deals			
5:00 PM						

ANNEX B: BACKGROUND INFORMATION ON SCHEDULED STAKEHOLDER MEETINGS

USAID PERU MISSION[101]

USAID/Peru's goal, as articulated in the Country Development Cooperation Strategy (CDCS) 2012-2016, is that Peru's stability and democracy are strengthened through increased social and economic inclusion and reductions in illicit coca cultivation and the illegal exploitation of natural resources. Given Peru's development context, the challenges and opportunities it faces, and the evidence that supports potential success, USAID's strategy focuses on realistic results within its manageable interest. USAID/Peru has prioritized three integrated Development Objectives (DOs):

DO-1: Alternatives to illicit coca cultivation increased in targeted regions

Under DO-1, USAID will continue to work with the regional government of San Martín to consolidate these gains while seeking to replicate this model in Ucayali and the Upper Huallaga Valley in Huánuco, following programmed eradication. USAID may engage in alternative development (AD) activities in other coca-growing regions where unique targets of opportunity for collaboration with the Government of Peru, other U.S. government agencies, or third parties present themselves. USAID will also strongly encourage the Government of Peru to adopt, finance, and replicate the proven "San Martín Model" throughout Peru.

DO-2: Management and quality of public services improved in the Amazon Basin

Good governance is necessary for sustainable economic and social development. Through DO-2, USAID will focus on improving governance and social inclusion in the Peruvian Amazon Basin so that regional and local governments can improve the management and quality of public services (including health and education) and better represent their constituents. This should help increase local economic opportunities and reduce the tendency to rely on illicit and environmentally damaging livelihoods or to resort to social conflict.

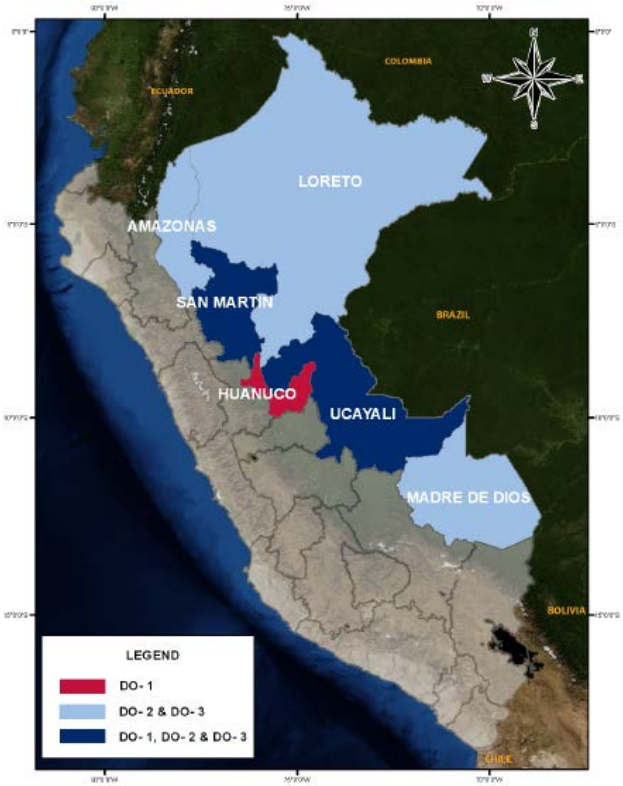
DO-3: Natural resources sustainably managed in the Amazon Basin and glacier highlands

DO-3 focuses on the forest and the glacier highlands—regions of environmentally critical global importance. USAID will spend approximately 80 percent of all environmental funding on forest-related sustainable landscapes and biodiversity programs in the Peruvian Amazon Basin. The remaining 20 percent of environmental resources will go toward global climate change adaptation programming to address threats, including water management issues associated with glacier melt in the Andean regions of Piura, Ancash, and Arequipa.

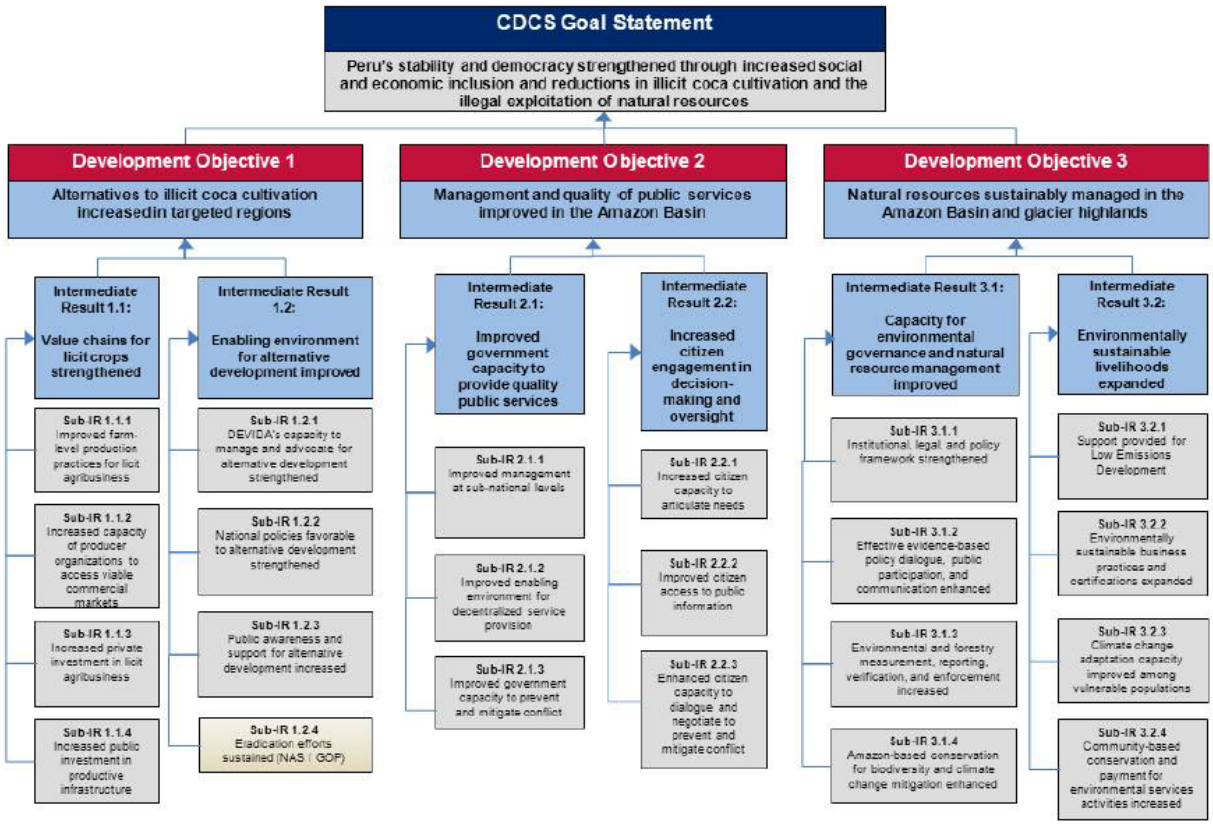
---

[101] USAID/Peru. 2012. "USAID/Peru Country Development Cooperation Strategy." Lima, Peru: USAID/Peru. https://www.usaid.gov/peru/our-work

Geographic Focus: To achieve the CDCS goal and Development Objectives, USAID/Peru will prioritize the five Peruvian Amazon regions of San Martín, Ucayali, Amazonas, Loreto, and Madre de Dios. These regions have become hubs for many of Peru's illegal activities, including coca cultivation, narco-trafficking, and illegal logging and mining. The three primary focus regions for assistance under DO-1 will be San Martín, Ucayali and, to some extent, areas within the Upper Huallaga Valley area of Huánuco. DO-2 and DO-3 will provide assistance to all five of the regions of the Peruvian Amazon, with DO-3 focusing on areas with high forest concentration.



***USAID/Peru CDCS Results Framework*:** The CDCS Goal, Development Objectives, and corresponding Intermediate Results (IRs) are represented graphically in the following Results Framework. This framework shows the relationship between the different results and how they contribute to the achievement of the objectives, and eventually the overall CDCS goal for Peru.



USAID PERU MISSION DIRECTOR

Lawrence Rubey was sworn as the USAID Mission Director for Peru on July 29, 2015. A career Foreign Service Officer, he has spent the past 20 years designing and implementing development projects and managing large, multi-cultural teams in Zimbabwe, Bolivia, Malawi, El Salvador, and Colombia. From 2013-2015, he was Deputy Mission Director for USAID/Colombia. From 2011-2013, he served as Director of the Office of Regional Sustainable Development in USAID's Bureau for Latin America and the Caribbean, where he led a group of 25 USAID technical experts in trade, economic growth, agriculture, crime prevention, democracy and human rights, health, education, and the environment.

Dr. Rubey is the author of many policy papers, journal articles, and book chapters on topics like food security, improving the functioning of markets, and enhancing the effectiveness of development assistance. A development economist with more than 25 years of professional experience, he has also held faculty positions at both U.S. and overseas universities and worked in the non-profit sector. He has a B.A. in Economics from Northwestern University, an M.A. in Economics from Boston University, and a Ph.D. in Agricultural Economics from Michigan State University.

INTER-AMERICAN DEVELOPMENT BANK[102]

The IDB is Peru's main multilateral lender—accounting for about 28 percent of the country's external public debt and 41.5 percent of its multilateral debt—and a front-line partner in the country's development. The IDB's close relationship with Peru transcends financial issues; it is also the main provider of technical cooperation and advice, knowledge products, and support for the private sector.

2012-2016 strategy: The strategy will aim to help close the economic and social gaps that exist between urban and rural areas, and support productivity gains as a basis for inclusive, sustainable economic growth. The areas prioritized in the strategy are: (i) social inclusion; (ii) rural development and agriculture; (iii) housing and urban development; (iv) climate change and disaster risk management; (v) water, sanitation, water resources, and solid waste; (vi) energy; (vii) transportation; (viii) public management; and (ix) competitiveness and innovation.

Selected IDB strategic objectives and expected results from IDB's results matrix are shown below.

IDB Strategic objectives	Results expected from the strategy
Promote and set up mechanisms to reduce emissions from deforestation and forest degradation	Increase the coverage of protected natural areas
	Increase the area of protected forest through mechanisms to offset climate services in infrastructure project areas of influence
Reduce the country's vulnerability to disasters and climate change	Reduce the country's disaster vulnerability
Strengthen government capacities and institutional coordination to respond to climate change challenges	Incorporate climate change adaptation in local disaster risk management groups
Adequately value the availability of water resources	Improve the efficiency of water use in irrigation projects
	Make irrigation systems sustainable
Improve water resource management in watersheds	Implement integrated watershed management in the country, incorporating a climate change perspective
Universalize access to water and sanitation services	Increase coverage in rural areas
	Increase coverage of the drinking water service in urban areas
	Increase the coverage of wastewater treatment service in urban areas
Strengthen solid waste disposal and handling at the municipal level	Increase the number of municipalities with final solid waste disposal
	Increase the number of municipalities with formally established municipal waste management units

[102] http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=36995914

. Inter-American Development Bank. June 2012. IDB Country Strategy with Peru 2012 – 2016.

Improve understanding of greenhouse gases (GHGs) and promote climate change mitigation measures (as part of the action plans promoted by the emerging and sustainable cities (ESC) initiative)	Prepare GHG inventory and inventory updating systems, identifying mitigation alternatives
Improve understanding of the risk and vulnerability to climate change impacts and adaptation alternatives (as part of the action plans promoted by the emerging and sustainable cities initiative)	Prepare maps of risk and vulnerability to climate change impacts, identifying adaptation alternatives
Support the development of a sustainable energy matrix	Improve the penetration of renewable energies in the energy matrix
	Strengthen the Ministry of Energy and Mines' (MEM) capacity to undertake medium- and long-term energy planning
Support improvement in the management and transparency of public enterprises in the energy sector	Contribute to the development of good corporate governance practices in public enterprises in the energy sector
Improve transportation infrastructure	Improve accessibility
	Improve the condition of the national road network
	Improve the condition of the departmental road network
	Improve the condition of the neighborhood road network
Improve urban mobility in cities	Increase the number of public transport passengers

OSCAR ARRUS (GARRINGUES FIRM): ATTORNEY FOR BONDS[103]

Garrigues is an international legal and tax services firm that provides business law advice on the main economic scenarios of the global marketplace. Since its creation in 1941, the firm has been noted for its international outlook and innovative nature. Garrigues is one of the largest international law firms and is among the top 100 most important law firms worldwide. Present in 12 countries, its team of experts provides business law advice on the most relevant and complex transactions on the market.

Oscar Arrús is a partner in the Lima office. His areas of expertise are financial transactions, corporate law, securities market law as well as oil and gas legislation. Arrús has extensive experience in all kinds of financing (including project finance, corporate finance, financing for business acquisitions, etc.), mergers and acquisitions, securities markets, and corporate transactions in general.

His professional career has been noted by the most prestigious international specialist publications, including Chambers & Partners, IFLR, and Who is Who, among others, all of which have recognized him as a leading practitioner in Peru in various areas of expertise.

[103] http://www.garrigues.com/en_GB/team/oscar-arrus . Garrigues. Oscar Arrus. Accessed September 24, 2015.

DELOITTE (SUB SOVEREIGN DEBT ANALYSIS)[104]

In Peru, Deloitte provides services through Beltrán Gris y Asociados S.C. de R.L., which is a subsidiary of Deloitte LATCO Regional Services Limited ("Deloitte LATCO") and is a DTTL member firm. Through Beltrán Gris y Asociados S.C. de R.L., they provide audit services; and through its related entities, they provide consulting, financial advisory, tax advisory, and others in accordance with the laws and regulations of Peru. Beltrán Gris y Asociados S.C. de R.L. has as related companies: Deloitte & Touche SRL, D Contadores Sociedad Anónima Cerrada and Deloitte Corporate Finance Sociedad Anónima Cerrada.

PROINVERSION (PPP AGENCY)[105]

ProInversión, the Private Investment Promotion Agency, is a public agency under the Ministry of Economy and Finance, with legal capacity under public law, technical, operational, administrative, economic and financial autonomy. ProInversión promotes the incorporation of private investment in services and public infrastructure, assets, projects, state enterprises and other state activities, based on State and Unsolicited proposals of national competence. Furthermore, it provides specialized technical assistance to public bodies in investment matters.

Currently, ProInversión manages a process to attract construction firms to explore and propose much needed infrastructure throughout the country without any green infrastructure emphasis. Through a Request for Proposals (RFP), ProInversión, with agreement from the Ministry of Economy and Finance and the Ministry of the Environment, could begin to engage more directly with climate friendly infrastructure project developers.

APOYO CONSULTING (PPPS AND CAPITAL MARKETS)[106]

APOYO Consultoría is a leading firm in business advisory services and a recognized strategic partner in decision making processes that involve economic, financial, business and public management issues. The firm takes on tasks relating to economic studies, corporate finance, public management, applied economics, management consulting, and investment management, and legal, tax, and corporate advisory services, among others.

Public Management -The firm provides consultancy services for Public Management and to design and implement Public Development projects in the areas of Corporate Social Responsibility (RSE), Works for Tax Deductions (OxI) or Public-Private Partnerships (APPs).

---

[104] http://www2.deloitte.com/pe/es/legal/about-deloitte.html . Deloitte. Acerca de Deloitte. Accessed September 24, 2015.

[105] http://www.proinversion.gob.pe/default.aspx?ARE=1&PFL=1&sec=40 . ProInversion. Accessed September 24, 2015.

[106] http://www.apoyo.com/en/ Apoyo Consultoria. Accessed September 24, 2015.

BBVA BANK- MARKET EXPERIENCE IN BONDS[107]

BBVA Banco Continental, the Peruvian unit of Spanish bank BBVA, is the country's second largest bank in terms of assets. Although principally focused on corporate lending and top consumer segments, the bank also operates as a universal bank offering a wide range of financial products and services, including saving and checking accounts, fixed-term deposits, consumer and commercial loans, mortgages, debit and credit cards, letters of credit, electronic collection services, foreign currency transactions, custody of securities, investment banking, portfolio management, and other banking services to businesses and individuals. The bank is part of Grupo Continental, controlled equally by Banco Bilbao Vizcaya Argentaria and Inversiones Breca S.A.

COFIDE PERU DEVELOPMENT BANK (POSSIBLE ISSUER)[108]

COFIDE is the Development Bank of Peru. It actively participates in Peru's sustainable and inclusive development through financing of productive investment and basic infrastructure. Its goal is to reduce interconnection gaps between cities, creating new jobs, contributing to trade, to the interconnection of communications, and to the improved quality of transport, education and mobility.

COFIDE concerns itself with the environment, financing ecological, innovative and transformative renewable energy solutions in order to promote clean energy. They accomplish this by building hydroelectric power plants and transmission lines, and thus promoting the shift to a green energy mix.

They also support entrepreneurship and entrepreneurs with innovative products and services, through counseling and free training, developing management skills to generate growth and boost entrepreneurship in the country.

AGROBANCO- REFORESTATION DEALS

Agricultural Bank, or AgroBanco, is the main instrument of state financial support for the sustained and continuous development of the agricultural sector, with special emphasis on agriculture, livestock, forestry, aquaculture, agro-industrial activities and the transformation processes, marketing and export of natural products derived from such activities.

AgroBanco has considered options for greening its credit policies, among them the possibility of restricting agricultural credit for activities that result in deforestation. It is presently evaluating financing of reforestation and it has a small portfolio related to sustainable forest management.

FITCH RATING AGENCY[109]

Fitch Ratings is a leading provider of credit ratings, commentary and research. Dedicated to providing value beyond the rating through independent and prospective credit opinions, Fitch Ratings offers global

---

[107] http://www.bnamericas.com/company-profile/en/bbva-continental-sa-bbva-peru. BN Americas. BBVA Continental S.A. Accessed September 24, 2015.

[108] http://www.cofide.com.pe/cofideportal/main/conozca

http://www.cofide.com.pe/cofideportal/main/conozca.COFIDE. ¿Qué es COFIDE? Accessed September 24, 2015.

[109] https://www.fitchsolutions.com . Fitch Solutions. Accessed September 24, 2015.

perspectives shaped by strong local market experience and credit market expertise. The additional context, perspective and insights we provide has helped investors fund a century of growth and make important credit judgments with confidence.

INTERBANK (PLACEHOLDER- BOND MARKET EXPERIENCE)[110]

Interbank is a commercial bank that offers general banking services to individuals, businesses and SMEs. Its main focus, however, is on retail banking. It operates as the flagship bank of Peruvian group Intercorp, a financial holding with operations in insurance, retail, education, real estate, and finance.

Interbank is a major player in agricultural financing, mainly on the coast, and has also started a program to green its operations

THE NATURE CONSERVANCY-(IMPLEMENTING PARTNERS WITH GREEN INFRASTRUCTURE FOCUS)[111]

The Nature Conservancy has partnered with Grupo GEA and the Fondo de las Américas (FONDAM) to launch Aquafondo, the Lima Water Fund. The Catholic University of Peru (PUCP), the Peruvian Society of Environmental Law (SPDA), the Union of Peruvian Breweries Backus, and Johnston S.A.A. also helped kick start this initiative. Together, all six founding members contributed an initial one million dollars to get the fund going. The Lima Water Fund will finance conservation projects such as stabilizing slopes, recovering lagoons and reforestation in the watersheds.

SUPERINTENDENCY OF BANKING, INSURANCE AND PENSION FUNDS

The Superintendency of Banking, Insurance, and Pension Funds is the agency responsible for the regulation and supervision of the financial, insurance, and private pension system and for preventing and detecting money laundering and terrorist financing. Its primary objective is to protect the interests of depositors, insured and members of the SPP. The SBS is a public institution whose functional independence is recognized by the Constitution of Peru.

MINISTRY OF ECONOMY AND FINANCE

The Ministry of Economy and Finance (MEF) of Peru is the entity in charge of the planning and execution of the economic policies of the Peruvian Government with the goal of optimizing the economic and financial activities of the state, establish macroeconomic activity, and achieve the sustainable growth of the nation's economy. Its headquarters is located in Lima. The current Minister of Economy and Finance

---

[110] http://www.bnamericas.com/company-profile/en/banco-internacional-del-peru-saa-interbank-peru . BN Americas. Banco Internacional del Perú S.A.A. Accessed September 24, 2015.

[111] http://www.nature.org/ourinitiatives/regions/southamerica/peru/index.htm

http://www.nature.org/ourinitiatives/regions/southamerica/peru/explore/aquafondo-the-water-fund-for-lima.xml. The Nature Conservancy. Lima Water Fund. Accessed September 24, 2015.

is Alonso Arturo Segura Vasi. The Ministry's mission includes designing, proposing, executing, and evaluating with efficiency and transparency, the economic and financial policies of the country in order to achieve sustainable economic development for the general welfare of the population. The MEF, in conjunction with the Ministry of Environment (MINAM), is leading the development of an investment strategy under the REDD+ Mechanism (Mechanism for Reducing Emissions from Deforestation and Forest Degradation) through the Forest Investment Program (FIP) of the Climate Investment Funds (CIF), which are geared to assist policies, programs and projects for mitigation and adaptation to climate change.

MINISTRY OF ENVIRONMENT

The purpose of the Ministry of Environment, MINAM, is to promote environmental conservation, and in particular to ensure the sustainable, responsible, and ethical use of natural resources and the environment. Moreover, it aims to contribute to social, economic and cultural development in relation to the environment, thereby ensuring that future generations are able to enjoy a balanced environment. MINAM is the main agency responsible for REDD+ activities in Peru and serves as the focal point for national climate change considerations. MINAM delegates its activities through its different general directions, including the National Service of Natural Protected Areas (SERNANP) and the National Forest Conservation Programme for the Mitigation of Climate Change (PNCBMCC). The Ministry's goals include developing the National Strategy for Climate Change, and developing projects for adaptation and mitigation and monitoring their implementation. The Ministry is also responsible for developing the national forest inventory, establishing mechanisms for the valuation, "incentivization" and retention of environmental services, as well as overseeing their financing and supervision. The Peruvian National Forest Inventory is being implemented jointly with the Ministry of Agriculture (MINAG). [112]

The Dirección General de Cambio Climático, Desertificación y Recursos Hídricos (DGCDRH) under MINAM is the national authority designated to comply with Peru's commitments to the UNFCCC. It is also is responsible for Peru's water resources and of its strategy to combat desertification and drought. The DGCDRH elaborates, updates and coordinates the national climate change strategy with the entities that comprise the National Commission on Climate Change. It also leads the implementation of the national GHG inventory system, it is responsible for developing the national environmental policy on water resources and the national strategy to combat desertification and drought.

MINISTRY OF ENERGY AND MINES (TO BE CONFIRMED)

Peru's Ministry of Energy and Mines (MEM) is the entity responsible for promoting the sustainable development of mining and energy activities in the country, which includes creating competitive conditions for private investment and environmental regulation. It also supports technical and scientific investigation related to mineral and energy resources, and grants concessions, awards contracts and promotes projects with a view to contributing to the country's potential for energy and mineral

[112] http://theredddesk.org/countries/actors/ministry-environment-peru http://theredddesk.org/countries/actors/ministry-environment-peru. The REDD Desk. Ministry of Environment (Peru). Accessed September 24, 2015.

development. Minister Ortiz was appointed on February 17, 2015. She was previously Director General of Hydrocarbons in the Ministry of Energy and Mines, and has served on several federal government bodies related to energy, gas, and investment.

ANNEX C: POTENTIAL ADDITIONAL MEETINGS IN AFOLU SECTOR

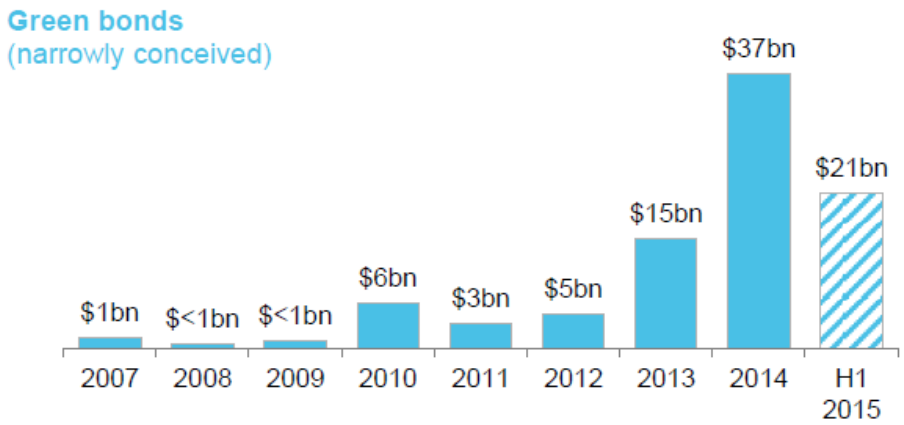
Meeting	Participants	Purpose
Forest Trends	Rupert Edwards, Frank Hicks, Jan Cassin and Gena Gammie	Rupert has been working on green bonds and Forest Trends in general is interested in investments in forest protection through agricultural production, which includes a strong component related to public and private investments to finance deforestation-free rural development.
Victor Galarreta, ex-Secretary of CIAM, president of MDA	Victor Galarreta	As president of MDA, Victor has been partnering with Forest Trends on the initiative mentioned above and is a thought leader on green finance in Peru.
CAF	Rene Gomez	CAF is financing the Amazon Forest Conservation and Recovery project, which include components related to improving forestry value chains and the development of financial instruments
FOGAPI		FOGAPI is the Fund for Loan Guarantees to Small Industries and promotes the access to credit by micro and small businesses.
SIGMA	Luis Carranza	Luis is the former Minister of Economy and Finance and currently head of SIGMA (Society for the Administration of Investment Funds) a business involved in operative leasing and private equity investments for transport and energy infrastructure development.
Thorne & Asociados	Alfredo Thorne	Alfredo is a leading financial expert on raising capital and debt, and is an ex-Senior Economist with the World Bank and ex-Executive Director of J.P. Morgan – Chase Area of Analysis for Latin America.

ANNEX D: GREEN BONDS: GLOBAL AND LATIN AMERICAN DATA

Global Green Bond Statistics

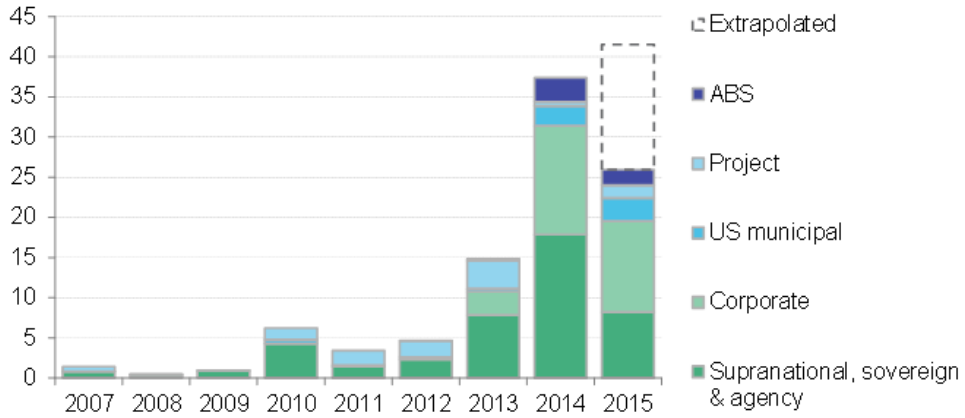
2014 witnessed more than doubling of green bonds issuances relative to 2013, up from $15 billion to $37 billion. 2015 is on track to exceed 2014 figures, somewhere north of $40 billion.

Figure D-1. Green Bond Issuance by Year



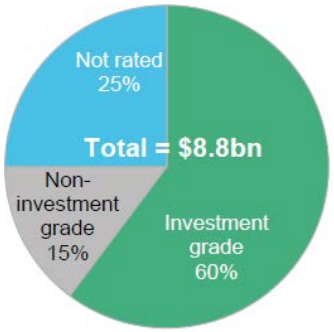
Source: BNEF, "What's so green about a green bond?". 2015. https://www.bnef.com/Insight/12767?fromGlobalSearch=2925261002

Figure D-2. Green Bond Issuance by Type and Year



Source: BENF, "H2 2015 Green Bonds Market Outlook". 2015, https://www.bnef.com/Insight/12757?fromGlobalSearch=2913595001

Figure D-3. Green Bond Ratings, Q1 2015 Issues



Source: BNEF, "What's so green about a green bond?". 2015. https://www.bnef.com/Insight/12767?fromGlobalSearch=2925261002

Figure D-4. Green Bonds - Top 10 Deals in 2014

RANK	ISSUER	CATEGORY	COUNTRY	DATE	AMT ($M)	COUPON (%)	TENOR (YR)	LEAD UNDERWRITERS
1	KFW	Sovereign, supranational & agency (SSA)	Germany	22 Jul	2,020	0.375	5	Credit Agricole, Deutsche Bank, SEB
2	GDF Suez	Corporate	France	19 May	1,782	2.375	12	Banca Intesa, BBVA, Banco Santander, Bank of America ML, BNP Paribas, Citigroup, Commerzbank, Credit Agricole, Credit Suisse, KBC, Mitsubishi, Natixis, Royal Bank of Canada, Societe Generale, Unicredit
3	GDF Suez	Corporate	France	19 May	1,645	1.375	6	Banca Intesa, BBVA, Banco Santander, Bank of America ML, BNP Paribas, Citigroup, Commerzbank, Credit Agricole, Credit Suisse, KBC, Mitsubishi, Natixis, Royal Bank of Canada, Societe Generale, Unicredit
4	KFW	Sovereign, supranational & agency (SSA)	Germany	15 Oct	1,500	1.750	5	Bank of America ML, Citigroup, Morgan Stanley
5	Agence Francaise de Developpement	Sovereign, supranational & agency (SSA)	France	17 Sep	1,287	1.375	10	Bank of America ML, BNP Paribas, Credit Agricole, HSBC
6	Iberdrola	Corporate	Spain	24 Apr	1,037	2.500	9	Banco Santander, Bank of America ML, Goldman Sachs, HSBC, JPMorgan, Lloyds
7	Unibail-Rodamco	Corporate	France	26 Feb	1,027	2.500	10	Bank of America ML, Barclays, Credit Agricole, Credit Mutuel, Deutsche Bank, Goldman Sachs, JPMorgan, Royal Bank of Scotland, UBS
8	European Investment Bank	Sovereign, supranational & agency (SSA)	Multilateral Institution (Europe)	15 Oct	1,000	2.500	10	Credit Agricole, JPMorgan, Morgan Stanley
9	European Investment Bank	Sovereign, supranational & agency (SSA)	Multilateral Institution (Europe)	8 Apr	837	2.250	6	Barclays, Deutsche Bank, HSBC, Royal Bank of Scotland, Bank of Nova Scotia
10	Ile de France	Sovereign, supranational & agency (SSA)	France	25 Apr	830	2.375	12	Credit Agricole, HSBC, Natixis

Notes: Joint-lead underwriters are allocated equal portions of each issue. Source: Bloomberg New Energy Finance.

Source: BNEF, 2014 Green Bonds League Tables. 2015. https://www.bnef.com/Insight/11340?fromGlobalSearch=2925445003

Figure D-5. Green Bonds - Top 10 Issues, 2014

RANK	ORGANISATION	CREDIT ($M)	COUNT	TABLE SHARE (%)
1	European Investment Bank	5,501	15	14.2%
2	KfW	3,520	2	9.1%
3	GDF Suez	3,427	2	8.8%
4	IBRD (World Bank Group)	2,900	15	7.5%
5	Toyota	1,750	1	4.5%
6	Agence Francaise de Developpement	1,287	1	3.3%
7	Unibail-Rodamco	1,251	3	3.2%
8	Iberdrola	1,037	1	2.7%
9	Ile de France	830	1	2.1%
10	Neder Waterschapsbank	681	1	1.8%

Figure D-6. Green Bonds - Top 10 Underwriters, 2014

RANK	ORGANISATION	CREDIT ($M)	COUNT	TABLE SHARE (%)
1	SEB	3,726	24	9.6%
2	Bank of America ML	3,588	30	9.2%
3	Credit Agricole	3,522	39	9.1%
4	Morgan Stanley	2,863	18	7.4%
5	JPMorgan	2,324	18	6.0%
6	Citigroup	2,295	16	5.9%
7	HSBC	2,102	14	5.4%
8	Deutsche Bank	1,939	11	5.0%
9	Goldman Sachs	1,040	8	2.7%
10	Royal Bank of Canada	1,035	10	2.7%

Example of Green Bonds in Mexico

The Inter-American Development Bank approved $125 million in financing for energy efficiency projects in Mexico. The financing will be focused on projects developed by Mexican energy service companies through the issuance of green bonds in the local capital markets. In the first phase of the transaction, the IDB financing is structured as a warehouse credit line for as much as $50 million. These investments will then be securitized in a second phase through the issuance of green bonds.[113]

Example of Green Bonds in Brazil

BRF SA, the Brazilian company that makes more than 5,000 processed-food products from frozen pizzas to lasagnas, completed the first so-called green bond sale in Latin America's biggest economy. The Sao Paulo-based company sold 500 million euros ($549 million) in notes due in 2022, with a coupon of 2.75 percent. The bonds will fund projects aimed at reducing water and electricity consumption, decreasing carbon emissions and lowering waste generation.[114]

---

[113] "IDB Approves $125 Million Financing for Mexico Energy Projects". BNEF, 19 May 2015, https://www.bnef.com/core/news/99858?fromGlobalSearch=2925615019

[114] "Food Producer BRF Raises $549 Million in Brazil First Green Bond". BNEF, 29 May 2015, https://www.bnef.com/core/news/100254?fromGlobalSearch=2925493016

ANNEX E: DRAFT SOW

CEADIR Assistance to Use Bonds and Other Financial Instruments to Develop Climate Friendly Infrastructure in Peru

Market Assessment

Draft Scope of Work

Submitted to USAID E3/GCC and E3/EP

Prepared by Crown Agents USA with Abt Associates Inc.

24 September 2015

Photo Credits: Integrarse

1. OBJECTIVE

USAID/Peru seeks technical assistance to conduct a comprehensive assessment of the potential for using bond issuances to finance green, climate-resilient infrastructure in key regions of Peru. The USAID Climate Economic Analysis for Development, Investment and Resilience (CEADIR) project, a USAID/GCC supported global initiative, will provide support to develop and undertake an assessment for the USAID Peru Mission in collaboration with multilateral, national and regional partners to determine the viability of using bonds to finance climate friendly investments in sectors such as clean energy, sustainable landscapes, and transport, as well as adaptation projects in sectors such as water.

The specific objectives of the analysis are to:

1) assess the existing impediments and incentives (legal and regulatory as well as financial) to/for launching a bond-based green financial structure for scaling up low-emission, climate-resilient infrastructure, clean and renewable energy, and sustainable landscapes, including a brief look at the broader enabling environment;
2) assess the size and volume of potential bond issuances in accordance with the capabilities of the domestic and regional capital markets;
3) identify regions and municipalities in Peru that have a demand and capacity to develop climate friendly infrastructure projects;
4) identify potential private sector parties that would bid on development and construction of green/climate-friendly infrastructure projects and the financial incentives likely to be most effective in attracting their interest;
5) compile from readily-available existing public information (including available national, department-level and Inter-American Development Bank (IDB) portfolios) a pipeline of potential climate friendly projects that could be financed as pilots with regional, national and/or municipal bond issuances;
6) identify the greenhouse gas (GHG) mitigation potential of "green" bond-financed projects in Peru; and
7) evaluate the use of green bonds for financing key team-identified LEDS mitigation (clean energy and sustainable landscapes) and adaptation actions, particularly as they connect directly to the National Climate Change Management Program (NCCMP) and the USAID Peru Mission's climate change program portfolio.

The output from CEADIR technical assistance to USAID/Peru will be an assessment that provides the country with detailed knowledge about the opportunities and capabilities to use bond issuance for financing green/climate friendly infrastructure investments aligned with national climate change and development goals. The final report will provide recommendations on how USAID/Peru could support green bonds and Public-Private Partnerships (PPPs) to develop climate friendly infrastructure in Peru in conjunction with the IDB.

2. RATIONALE

The World Economic Forum 2013 Global Competiveness Report states the infrastructure gap is enormous and has left Latin America with unfavorable rankings in infrastructure: out of 148, Mexico is at 66, Peru is at 101, Brazil is at 114, and Colombia is at 117. The Association for Infrastructure Development (AFIN) estimated that Peru's infrastructure deficit tops $80 billion, with the largest gaps in

energy, transportation, and sanitation (water and waste disposal). A narrower evaluation of the investment climate for clean energy in developing countries by Climatescope 2014 provided a more optimistic assessment of the environment for green investment in Peru, ranking the country 11th of 55 overall—1st in removing policy barriers, promoting clean energy for rural electrification, and facilitating carbon trading, and 35th for loan and grant programs. The nominal cost of debt is also relatively high (over 18 percent). The Government of Peru (GOP) has made efforts to secure investment through PPPs with *Obras Por Impuestos,* a program that allows companies to invest in public works in lieu of paying taxes to reduce the infrastructure gap, as well as co-financed partnerships through concession models with regional governments. Many of the infrastructure projects proposed to regional governments under *Obras Por Impuestos* do not involve "green approaches". However, opportunities often exist for "greening" even such conventional projects as roads, water distribution systems, and airports.

The world's fast-growing cities and developing countries face an increasing challenge from climate change—they need roads, airports, buildings, water systems, and energy supplies that can stand up to rising global temperatures and extreme weather patterns. Incorporating measures to address climate change risks will often have some associated additional cost. Farms and food supply chains are also at risk without new investment. Finding the funding for this investment gap, especially for governments with already limited budgets, is challenging. However, the cost of doing nothing is even greater. As Secretary Kerry said at the United Nations Conference of Parties in Peru, "We have to factor in the long-term cost of carbon pollution. And we have to factor in the cost of survival itself. And if we do, we will find that the cost of pursuing clean energy now is far cheaper than paying for the consequences of climate change later…climate change presents one of the greatest economic opportunities of all time on earth."

Green infrastructure includes energy, transport, sustainable landscape (agriculture, forestry), waste and water systems. CEADIR focuses on helping countries to mobilize and increase access to finance for clean energy and sustainable landscape interventions that reduce GHG emissions, as well as for adaptation interventions that reduce vulnerability to climate change.

The country's relatively low electricity prices mean that the market for renewables is dependent on government-driven renewable energy auctions. In 2013, 240 MW was contracted through auctions involving 19 small hydro projects at an average price of $56.55/MWh. That same year, Peru announced its first off-grid renewable energy auction, which was concluded in 2014, and will seek PV systems to expand electricity coverage to 500,000 users in rural and isolated areas of the country. From 2006 to 2013, the country attracted $3.4 billion in clean energy investments primarily a mix of wind and solar. In 2013, $773 million was invested, with the majority going to wind and small hydro. Solar, which saw more than $400 million invested in 2011 and 2012, is awaiting opportunities in off-grid and in future auctions.

The financial markets have developed a new approach to attracting greater investment to "greening" infrastructure and clean energy. Beginning in 2008, the World Bank began issuing green bonds as a small part of the institution's conventional bond issuance, fixed income, and liquid financial instruments used to raise funds dedicated to climate mitigation, adaptation, and other environment friendly projects. In helping to scale the intervention, the involvement of the multilateral development banks has expanded interest in green bonds, with government agencies, municipalities, and more recently private banks, utilities, and corporations finding innovative ways to use the financial instruments – a total of $36 billion in 2014 to developing countries. Climate finance bonds, a sub-set of green bonds, have the specific goal of increasing investments in actions that measurably and verifiably reduce GHG emissions (or enhance GHG emission sequestration) and/or reduce vulnerability to climate change, thereby leading to climate-resilient, low emission development.

Since 2013, the GOP has been committed to the development of a low emission development strategy (LEDS), in support of national development goals, which will contribute assessments of threats to economic development (including climate change), and a list of actions to improve economic growth while reducing GHG emissions. The GOP is currently in the process of implementing the NCCMP, which includes plans for a multi-institutional platform to optimize the leverage and effectiveness of resources from entities working on mitigating the impact of climate change.

Peru has already had some initial success with issuance of green bonds. The International Finance Corporation (IFC) issued the first green bond on the Peruvian market, raising PEN 42 million (US$15.1 million).[115] It is a 20 year bond with an implied yield of 5.3 percent and was designed for a domestic investor, RIMAC Seguros, Peru's leading insurance company, for clean energy projects. The inclusion criteria were reviewed by the Center for International Climate and Environmental Research, a research center established by the Norwegian government.[116]

The second green bond issuance in Peru was by Energia Eolica SA for US$204 million with a coupon of 6 percent per annum and 20 year tenor for construction of two wind projects. These wind farms have a 20 year guaranteed power purchase agreement. Peruvian pension funds and insurance companies made up more than 80 percent of the order book.[117] Peruvian investors were more familiar with the country's economy and had less concern for size—critical given that international buyers demand a premium for less liquid transactions.[118] Once the risky construction phase is completed, institutional investors are expected to be more interested.[119]

3. SCOPE OF WORK

USAID/Peru is seeking a comprehensive review, market assessment, and initial recommended structure for the use of climate bonds for supporting the expansion of green, climate-resilient infrastructure, including clean energy, sustainable landscape, and adaptation investments. USAID's CEADIR project will provide such technical assistance to the GOP by helping assess the market for green/climate bonds in Peru. The market assessment will include

---

[115] Aii Data Processing L. IFC issues USD-15m green bond in Peru. *SeeNews Renewables* [serial online]. August 13, 2014: Available from: Business Source Corporate Plus, Ipswich, MA. Accessed March 16, 2015.

[116] Kidney, Sean. "IFC Issues First Peruvian Soles-denominated PEN 42m ($15m) Green Bond, for Domestic Investor RIMAC Seguros, AAA, 20yr. A Fantastic Kick-start for a Domestic Green Bond Market in Peru?" Climate Bonds Initiative, 14 Aug. 2015. Web. 16 Mar. 2015. <http%3A%2F%2Fwww.climatebonds.net%2F2014%2F08%2Fifc-issues-first-peruvian-soles-denominated-pen-42m-15m-green-bond-domestic-investor-rimac>.

[117] "Energia Eolica Brings Dawn to LatAm Green Bond Market." LatinFinance, 17 Dec. 2014. Web. 16 Mar. 2015. <http://www.latinfinance.com/Article/3411361/Energia-Eolica-brings-dawn-to-LatAm-green-bond-market.html#.VQdDyo54qfY>.

[118] "Energia Eolica Brings Dawn to LatAm Green Bond Market." LatinFinance, 17 Dec. 2014. Web. 16 Mar. 2015. <http://www.latinfinance.com/Article/3411361/Energia-Eolica-brings-dawn-to-LatAm-green-bond-market.html#.VQdDyo54qfY>.

[119] Kidney, Sean. "Peru's First Domestic Green Bond from Energia Eolica; $204m, 6%, 20y, BBB-." Climate Bonds Initiative, 1 Jan. 2015. Web. 16 Mar. 2015. <http%3A%2F%2Fwww.climatebonds.net%2F2014%2F12%2Flast-reviews-year-peru%25E2%2580%2599s-energia-eolica-204m-and-norway%25E2%2580%2599s-vardar-41m-are-new-issuers-swedish>.

1) **Summary desktop review** of existing bond market, existing depth of the green/climate friendly bond market, and barriers to its expansion, with a core focus on the Peruvian market; and,
2) **Market assessment** with a detailed presentation of the barriers and opportunities as well as recommendations for a green bond and climate finance facility development by the GOP with the engagement of the private sector.

Using existing public and private sector financial mechanisms, such as potential renewable energy auctions, USAID/Peru proposes to challenge regional governments and the private sector to respond to a call for "green" and climate-friendly projects that support the transition to low-carbon and climate-resilient development and growth in Peru.

3.1 APPROACH AND METHODOLOGY

USAID/Peru, through CEADIR and mission collaboration, with the Inter-American Development Bank (IDB) will engage with the Ministry of the Environment (MINAM), the Ministry of Economy and Finance (MEF) and the Agency for the Promotion of Private Investment (ProInversion) of the GOP to assess the viability constraints and potential framework for incentivizing the regional governments and the private sector to issue and invest in green bonds to build, operate and maintain green infrastructure. Beyond a market analysis, if suitable investment vehicles and financial interest are identified, the USAID Peru mission plans to co-guarantee with IDB 50 percent of the value of a pool of small and medium size projects through a green bond issuance to promote low carbon climate resilient development, pool domestic capital via capital markets and engage private sector participation.

The assessment will include interviews with key stakeholders (e.g., COFIDE Development Finance Corporation) involved in issuing, regulating and investing in green bonds or a climate finance facility. For example, currently, ProInversion manages a process to attract construction firms to explore and propose much needed infrastructure throughout the country without any green infrastructure emphasis. Using a bond guarantee, USAID and IDB could reduce the risk profile and costs of capital for winning bids. Through a Request for Proposals (RFP), ProInversion, with agreement from MEF and MINAM, could begin to engage more directly with climate friendly infrastructure project developers. Through concession agreements with regional governments, participation from the private sector can be long-term (approximately 30 years) and raise substantial resources.

A goal of the market assessment will be to help recommend how to train interested regional governments to design green/climate friendly infrastructure project solicitations effective for generating private sector bidding. With the incentive of a bond guarantee, it is expected that the demand for developing and investing in green/climate friendly infrastructure projects will increase.

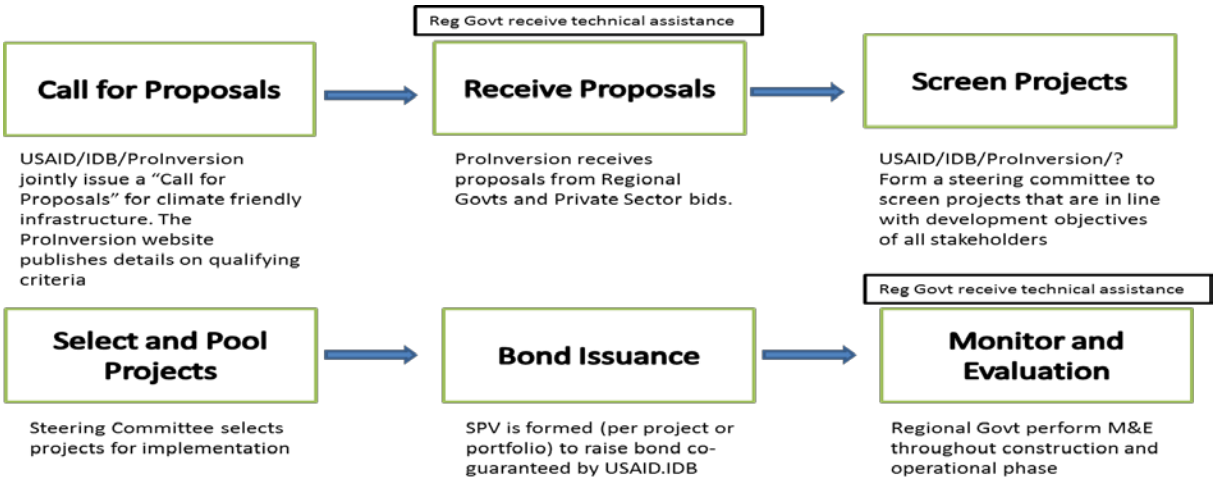
The bond guarantee is estimated to guarantee up to $100-$200 million in investment, applied to a group of 5-7 small and medium size projects using a PPP concession model. While each project will have its own risk profile, they will be grouped together and share a blended profile for a single bond issuance for a portfolio of green infrastructure projects. Further, in agreement with all stakeholders, USAID/IDB can request that all project proposals be submitted within 6 months to a year of the RFP to structure the selected projects in a single bond issuance. One possible bond investor to be explored is the Association of Pension Funds of Peru. This association is currently seeking more investments in the domestic market since it is limited in how much it can invest outside Peru. Other potential buyers will also be explored.

CEADIR will explore how USAID/IDB, MINAM and ProInversion could define the specifics of eligible green, climate-friendly infrastructure projects drawing on established green bond principles and international good practice.

CEADIR will recommend viable and sustainable bond issuance needs and capabilities as well as, if appropriate, recommend potential pipeline development processes, key PPP partners for collaboration, the necessary terms/conditions for successful issuance to attract local and international funds to achieve Peru's climate change and green infrastructure goals. Figure 1 contains an illustrative project development pipeline framework that CEADIR will explore.

Peru has identified infrastructure as a major constraint on growth. The Government of Peru has provided some incentives to the private sector to respond to the demand. However, to date, few private sector proposals have incorporated a "green aspect" to the infrastructure proposal. Both USAID and IDB's development goals include climate change measures and should provide a catalyst for sustainable economic growth. This project will aim to show the private and public sectors the profitability and risks of green/climate friendly infrastructure investments.

Figure 1. Illustrative Green Bond Proposal Pipeline Development Process



3.2 PROPOSED TASKS

CEADIR will undertake for USAID/Peru and the GOP three main tasks to deliver the market assessment and recommend options for bond and PPP collaboration to finance green, climate-friendly infrastructure. The duties and responsibilities of CEADIR will be as follows:

- **Task 1. Develop Summary Desktop Review:** Prepare an initial desktop review of the relevant green bond market and climate finance feasibility from secondary sources including available literature and online sources. Submit to USAID and GOP for review within four weeks after the kick-off meeting. Revise the desk-top report after receiving feedback from all recommended reviewers.
- **Task 2. Conduct Country Market Assessment Mission:** After receiving USAID travel approval, a CEADIR team will conduct a country scoping assessment with USAID/Washington staff to interview selected public and private sector stakeholders knowledgeable of the Peruvian

bond market, LEDS, clean energy, sustainable landscapes, transport, adaptation, and investment climate during a 1 week mission to Peru.

- **Task 3. Prepare the Draft Market Assessment Report:** Prepare a market assessment report based on the initial review and in-country assessment mission that will:

  i. identify primary regions and municipalities in Peru that would have a demand and capacity to develop green/climate friendly infrastructure;
  ii. assess the approximate size of a bond issuance in accordance with the capabilities of the local and regional capital markets;
  iii. assess the existing impediments for such a structure;
  iv. identify potential private sector parties that would bid on potential green/climate friendly infrastructure projects;
  v. if approved by USAID based on funding and time available, include a preliminary financial analysis of the green bond issuance and costs of developing a climate finance facility based on secondary information (not collecting primary financial data of costs and benefits); and,
  vi. recommend potential structure for the green bond market and potential climate finance facility.

  - **Task 4. Submit Draft Assessment Report:** Submit the draft market assessment report to USAID for review and comments within six weeks of returning from the country. USAID/Washington will respond with comments, questions, and edits.
  - **Task 5. Finalize Market Assessment Report:** Prepare final report incorporating comments and suggestions made by reviewers of the draft report. The final report shall be in English and shall be due within 2 weeks after receiving USAID comments and edits to the draft assessment report.

3.3 DELIVERABLES

The draft report will include the following information:

1. Identify key regions and municipalities in Peru that would have a demand and capacity to develop green/climate friendly infrastructure;
2. Assess the approximate size of a bond issuance in accordance with the capabilities of the local and regional capital markets;
3. Assess the existing impediments for such a structure, including financial market regulation and trading exchanges, and market demand;
4. Identify potential private sector parties that would bid on potential green/climate friendly infrastructure projects;
5. If approved by USAID and funds and time permit, conduct a preliminary financial analysis of the green bond issuance and costs of developing a climate finance facility based on secondary information (not collecting primary financial data of costs and benefits); and
6. Recommend potential structure for the green bonds and associated market and potential climate finance facility.

The final report will be thoroughly annotated with footnotes citing relevant pages in source documents.

4. TIMELINE

Table 1. Proposed Tasks, Deliverables and Timetable for CEADIR Peru Green Bond and PPP Activity

Tasks	Deliverable	Proposed Dates
Convene Kick-Off Meeting with conference call	Summary Memo and Agreed Actions	Conference call meeting as soon as key parties can participate following approval of SOW and budget
Develop Desk-Top Review Report	Initial and Final Reports	Initial within 2 weeks of kick-off meeting; Final 2 weeks after receiving all input from USAID
Conduct Country Mission	Exit Briefing to USAID/Peru with briefing note	Towards end of mission, prior to departure from country
Prepare and submit Draft Market Assessment Report	Draft Market Assessment Report	Within 6 weeks after return from country
Revise and finalize Market Report	Final Market Assessment Report	Within 2 weeks after receiving written input from all reviewers

5. PROPOSED STAFF

The CEADIR team will bring together and manage a team of international and local experts in climate finance to support USAID/Peru and the GOP. The CEADIR Peru team will report directly to the USAID CEADIR management team and the USAID/Peru investment officer and climate change staff. The CEADIR Peru team will be supervised by the CEADIR project management and USAID CEADIR Activity Managers as well as coordinate and collaborate with USAID/Peru, as requested.

The proposed staffing and positions for the team will include:

Team Leader/Country Activity Manager: MICHÈLE LAIRD

Michèle Laird is a Principal Associate in the Climate-Smart Development Group of Abt Associates and is among key personnel on CEADIR. She has over 20 years of experience working in developing countries, in sectors such as financial markets, private sector development, water, agriculture, health, housing, energy, and municipal infrastructure, helping improve the sustainable economic well-being and resilience of people and communities. She also has 25 years of experience in investment analysis, and draws on this as well as climate science in working with stakeholders to analyze climate change options. Her background combines investment banking and venture capital experience with expertise in the field of climate change. This combination of experience and expertise in climate change adaptation and mitigation analysis and investment mobilization allows Ms. Laird to effectively advise communities, government counterparts and clients on developing and implementing climate change action plans. In addition, she has advised on regulatory environments governing financial markets and investments, led capacity building efforts for lenders and borrowers to increase access to finance, implemented investor awareness campaigns, and has developed specialized investment funds to promote under-financed sectors. Ms. Laird recently directed an IDB-funded climate change adaption project in southern Mexico which, through a variety of models, analyzed the physical, social and economic impacts of climate change;

developed intervention proposals based on the analysis and participatory processes; and prioritized investment options. As Analysis and Investment for Low-Emission Growth (AILEG) Country Team Leader for Colombia and Mexico, Ms. Laird managed USAID-funded activities in Colombia, including a hydrology/land-use/PES model of the Magdalena Watershed to help inform the Huila Climate Change Adaptation Plan, an economic environmental evaluation of an ecosystem, and MAC curves for the commercial building sector. She has an M.P.Aff. from the Lyndon Baines Johnson School of Public Affairs at the University of Texas at Austin and a B.S. in Computer Science from Brown University and is a Certified Expert in Climate and Renewable Energy Finance (Frankfurt School of Management/UNEP). She speaks, reads, and writes English, Spanish and French.

Role and responsibilities: Ms. Laird will serve as the CEADIR Team Leader for the Peru green bond activity and will be ultimately responsible for the submission of all deliverables. She will focus on the awareness of stakeholders regarding green bonds and the appetite/demand in the private investor market for such instruments, leading to an assessment of feasible bond issuance size and terms. She also will work in identifying obstacles to subnational issuances (market and regulatory) and steps to overcome them. With the team she will propose a green bond/green-bond-market structure.

LEDS Market Advisor: PABLO TORRES

Mr. Torres is a CEADIR technical expert and an international development professional with 12 years of project implementation, business development, research, and technical experience with USAID, US Government agencies, and Multilateral Development Banks. His experience encompasses Information and Communication Technology and low carbon, climate-resilient development, with a particular interest in clean energy and climate finance. In 2012, Mr. Torres supported various USG agencies in the startup of the EC-LEDS program in Costa Rica. He then worked for a USAID contractor serving as the point person on LEDS, including developing a training course on LEDS for the USAID Office of Global Climate Change and to build the capacity of USAID Mission personnel. Subsequently, he worked as Program Analyst for the 130+ project Clean Technology Fund of the Climate Investment Funds, which finances renewable energy, energy efficiency, smart grid, and low carbon transport projects in middle-income countries. He holds a Master of Environmental Management from Yale University and currently serves as Operations Manager for the CEADIR project.

Role and responsibilities: Mr. Torres will support the Peru green bond activity through research and writing for the desktop summary review, participation in meetings with stakeholders, development and sharing of notes from all stakeholder meetings, as well as data collection for the market assessment and finalization of the desktop review. As part of his research, Mr. Torres will use BNEF data on Peru in particular and South America in general to inform the desktop review. In addition, as well as general contributions to the market assessment, he will identify and preliminarily analyze the regions in Peru that have a demand for and capacity to develop green infrastructure and other mitigation and adaptation projects that could be financed with green bonds. Mr. Torres will analyze the eligibility of projects as related to voluntary green bond principles and standards, and if timing allows, with estimating GHG emission reduction potentials from possible green bond financed projects in Peru. Mr. Torres will work with Ms. Laird on the market assessment itinerary and coordination of meetings and logistics.

Sustainable Landscapes Market Advisor: LAWRENCE SZOTT

Currently based in Lima, Peru, Lawrence Szott is an international development specialist dedicated to linking agriculture, forestry, and natural resource management and conservation to climate change, rural development, and sustainable landscapes and livelihoods. Experienced with the adaptive application of science, business, and project management principles to improving the use of natural, social, and financial capital by rural dwellers, communities, businesses, and governments Dr. Szott has deep experience in Peru and elsewhere in Latin America. As Director of FUNDECOR-PERU, Dr. Szott led this organization

dedicated to sustainable natural resource management via market mechanisms, payments for ecosystem services and other innovative financing, public policy, and technological interventions and transfer. Dr. Szott holds advanced degrees (MS, PhD) in tropical agroforestry/forestry, natural resource ecology/economics.

Role and responsibilities: Dr. Szott will serve as a sustainable landscapes expert, providing input into sustainable landscapes projects that could be financeable by green bonds and also providing information on local financial markets and stakeholders as they relate to sustainable landscapes financing.

Local Green Bond Market Expert(s) – TBD (will meet with in Peru)

The CEADIR team will draw on national and regional/local expert(s) in Peru who have participated in previous issuance of green bonds and are familiar with Peru's bond market, climate change plans, and development of these instruments.

Role and responsibilities: Local experts will provide on-the-ground knowledge and access to data and stakeholders, particularly following the assessment trip.

International Climate Finance Advisor - ALAN MILLER

Alan Miller is a consultant with Crown Agents and the senior climate finance specialist for CEADIR. He is an internationally recognized authority on climate finance and policy. His clients include UNDP, USAID, ADB, and the World Bank. In January 2014, he retired after 16 years working on climate change issues for the World Bank Group, including 10 years for the International Finance Corporation (IFC), the private sector lending arm of the Bank, and 6 years at the Global Environment Facility (GEF), a multilateral fund supporting climate change projects. His responsibilities included representing the IFC/WBG in international forums focused on climate change and green growth including meetings of the UN Climate Convention and the G20, as well as climate change policy development, training, and publications. At the GEF he was Climate Change Team Leader responsible for managing policies and approval of over $1 billion in donor funding for clean energy projects in more than 70 developing countries. He is the author or co-author of several books and numerous articles on environmental policy and has taught at 10 universities in colleges of law, natural resources, and public policy. He was twice a Fulbright Scholar, in Australia (1977) and Japan (1987).

Role and responsibilities: Mr. Miller will review deliverables and contribute input on risk mitigation instruments, incentives, and enabling environment.

International Private Financial Markets Advisor – EDWARD DREYFUS

Edward Dreyfus is an experienced international banker now providing investment advisory services on project development and financing strategies for natural resource, land development, energy, agro, and environment opportunities. He has a global orientation with a specialty in Latin America. Mr. Dreyfus has a successful executive track record in private, public, and NGO sectors, including Citibank, Chase, independent turn-around management, and Clinton Foundation.

Role and responsibilities: Mr. Dreyfus will, as needed, provide a private sector perspective on expectations of private investors with regard to green bonds and requirements to increase investor appetite.

The USAID CEADIR Activity Managers will lead the activities and all coordination with USAID/Peru.

6. BUDGET

Submitted separately in a spreadsheet.