

Acting Now on Climate: How is Peru addressing climate change and moving toward a low-carbon future?



Peru is on the frontlines of the fight against global climate change. The melting glaciers of its Andean peaks bear witness to increasing global temperatures. Communities and infrastructure in low-lying coastal zones are susceptible to sea level rise, and a changing climate means new potential threats to important economic sectors such as fisheries and agriculture. Faced with these growing challenges, Peru is striving to address and adapt to its climate vulnerabilities. At the same time, Peru has also recognized the urgent need for ambitious action to mitigate greenhouse gas emissions. Despite being a comparatively minor contributor to worldwide emissions, Peru is moving toward a low carbon path by protecting forest carbon reserves and tackling emissions from key sectors.

CLIMATE PROFILE: PERU

GHG EMISSIONS: (Mt CO₂eq.)¹

2011–Including LUCF
153.65 Mt CO₂eq

Peru ranks as the **sixth largest emitter in Latin America and the Caribbean** and the 46th largest globally.

TOP THREE SOURCES:

Forestry:
45%

Energy:
30%

Agriculture:
14%

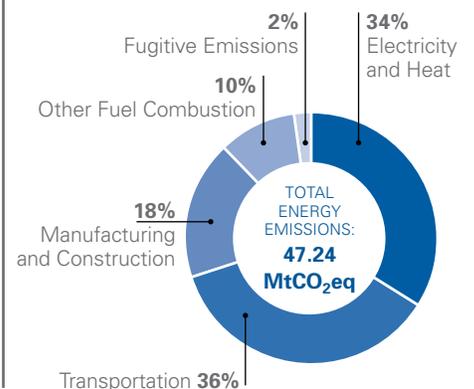
CLIMATE CHANGE MITIGATION PLEDGES: (Voluntary)

Reduce the **deforestation** rate to zero on 54 million hectares of primary forests of diverse categories.

Increase use of non-conventional **renewables** and hydroelectricity to represent at least 40 percent of national energy consumption.

Reduce emissions caused by inadequate **solid waste** treatment.

SOURCES OF ENERGY EMISSIONS



For Manuel Pulgar Vidal, Peru's Minister of the Environment and President of COP20, the conference is ***"the ideal place to visualize the Peru of the future. A country that grows with low carbon emissions... and that is able to build a concerted State policy, in line with our "climate commitment," with clear institutional structures that are multi-sectoral, multilevel and have broad public and private participation.... This is Peru's moment."***

According to data from the World Resources Institute, Peru had annual emissions of 154 million metric tons of CO₂eq in 2011. Peru ranks as the sixth largest greenhouse gas emitter in the Latin America and Caribbean region and 46th largest globally. Deforestation and land use change, and energy for both electricity production and transportation are the main drivers of Peru's emissions, responsible for 45 percent and 30 percent of the country's total emissions, respectively. Peru's emission levels have increased by 60 percent since 1990 and will continue to rise unless ambitious action is taken.²

In recent years, Peru has emerged as one of Latin America's more active and progressive countries on climate change by making voluntary emission reduction pledges in its forestry, energy, and waste sectors.³ Importantly, the Peruvian government recognized that mitigation has potential economic and social benefits compared with the costs of reducing emissions.⁴ As part of the Independent Association of Latin American and Caribbean States (known by its Spanish acronym AILAC), Peru has called for all nations to take concrete and ambitious action on climate change and stressed the importance of a legally binding global agreement to hold countries accountable.⁵ As the host of the December 2014 round of climate negotiations (the 20th session of the Conference of the Parties or COP20), Peru's leadership can help set the stage for a new global climate agreement in Paris in 2015.

Peru can also seize the opportunity to continue to build and develop its own climate agenda. A key step will be finalizing and passing a framework law on climate change, expected in 2014. The proposed version—backed by civil society organizations—would strengthen the Ministry of Environment (MINAM) so that it can better coordinate national climate policies and ensure the follow-through necessary for Peru to meet its climate commitments.⁶ In 2011, Peru approved an action plan for the 2010–2021 timeframe and pledged that, with support from the international community, it would work to:⁷

- Reduce net emissions from land use, land use change, and forestry by protecting 54 million hectares of primary forests. This would avoid emissions of up to 50 Mt CO₂eq and mean a 45 percent emission reduction compared to 2000 levels.
- Produce at least 40 percent of its total energy use from nonconventional renewable energy^a and hydropower. In combination with energy efficiency, this effort would cut 7 Mt CO₂eq and reduce emissions by 28 percent from 2000 levels.
- Capture and use methane from urban solid waste in 31 large and medium cities. This program could reduce emissions by 7 Mt CO₂eq.

In addition to reducing greenhouse gas emissions, actions in these three sectors would also benefit local environmental quality and public health, preserve important natural resources, and help Peru meet long-term development goals. For Manuel Pulgar Vidal, Peru's Minister of the Environment and President of COP20, the conference is *"the ideal place to visualize the Peru of the future. A country that grows with low carbon emissions... and that is able to build a concerted State policy, in line with our "climate commitment," with clear institutional structures that are multi-sectoral, multilevel and have broad public and private participation.... This is Peru's moment."*⁸ In addition to continuing to show international and regional leadership on climate, COP20 is a time for Peru to encourage action to meet its climate and development goals from all levels of government and sectors of society.

This document is meant to be a snapshot of actions Peru is taking in its forestry and energy sectors, the source of three quarters of the country's current greenhouse gas emissions, which are relevant to its emission mitigation goals. The efforts highlighted here are not an exhaustive list of all climate change related actions in these sectors. Additionally, while recognizing that addressing solid waste management in urban areas is an important priority for Peru and other developing countries, this document will not address Peru's methane capture plans.

a Defined as solar, wind, geothermal, tidal, biomass, and small hydroelectric power up to 20MW.

SLASHING EMISSIONS FROM DEFORESTATION



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With forest loss accounting for at least 10 percent of global greenhouse gas emissions, tackling deforestation is a critical climate priority.⁹ In Peru—home to the second largest expanse of tropical forest in Latin America—45 percent of national emissions come from forestry and land-use change.¹⁰ The government estimates that in recent years, Peru has had an annual average deforestation rate of approximately 106,000 hectares, while cumulatively the country has lost 7 to 10 million hectares of forest according to the head of the national forest service.¹¹

This deforestation is the result of a complex mix of drivers. Historically, the main cause of forest loss and degradation in Peru has been small-scale agriculture. In fact, it is estimated that across the country approximately 75 percent of annual deforestation is the result of clearing plots smaller than half a hectare in size.¹² However, it is important to note that while cumulatively this activity is responsible for the most land conversion, it does not always result in permanent deforestation. Vegetation is frequently allowed to regenerate as part of the cultivation cycle so this number does not correspond entirely to small-scale farmers clearing previously

untouched primary forest. In contrast, large-scale agriculture such as for oil palm plantations can rapidly clear plots of up to 10,000 contiguous hectares in a timeframe that does not typically allow for forest regeneration.¹³ The development of infrastructure projects for energy production and extraction, as well as transportation, also contributes to the expansion of deforestation in the Peruvian Amazon. For example, three quarters of deforestation occurs within a 20 kilometer radius of highways.¹⁴ Mining is yet another cause of forest degradation and loss in the Peruvian Amazon, notoriously in the Madre de Dios region. These drivers of deforestation have been, in turn, the results of demographic changes in the Amazon region, increased demand for commodities, economic support for extractive and productive sectors, and weak institutional and legal frameworks.¹⁵

Curbing Peru's forest loss would not only have a positive climate impact, it would also help secure vital water, energy, and food resources for millions of people, as well as protect immeasurable biodiversity and traditional communities, including some that remain isolated from the broader world by choice.

CLIMATE COMMITMENT: ZERO NET DEFORESTATION IN PRIMARY FORESTS

The Peruvian government first announced its plans to curb deforestation at the 2008 climate talks in Poznan, Poland. The following year in Copenhagen, it formally presented its goal of bringing the net deforestation rate down to zero by 2021 by conserving primary or natural forests.¹⁶ This undertaking is substantial. More than 60 percent of the country's territory—some 73 million hectares in total—is blanketed in green, making Peru second in the Western Hemisphere and fourth in the world in terms of its area of tropical forest cover. More than 80 percent of this land is categorized as primary forest.¹⁷ To move toward this forestry climate goal, Peru is taking action both domestically and internationally.

National Program on Forest Conservation for Climate Change Mitigation

Peru created the National Program on Forest Conservation for Climate Change Mitigation (PNCB) via a national decree in October 2010. The 10-year program's objective is to conserve 54 million hectares of primary tropical forest across different management and protection categories in 17 regions of the country.¹⁸

The PNCB focuses on mapping and monitoring forest areas; promoting sustainable productive land use alternatives; and building capacity at the national, regional, and local levels.¹⁹ The program is implemented through Forest Conservation Incentive Agreements with regional and local governments and indigenous and rural communities. To date, agreements exist with 48 communities and with the regional governments of Amazonas, San Martín, Pasco, and Loreto.²⁰ The PNCB implements conservation incentive payments to local communities through direct transfers of 10 Peruvian Soles, approximately US \$3.80, annually per hectare conserved. The payment system is expected to eventually cover 10.5 million hectares of Amazon forest managed by indigenous communities to compensate conservation on a local level.²¹

Reducing Emissions from Deforestation and Degradation (REDD) in Peru

Peru is also an active participant in global processes to create a financial value for forest carbon to support efforts to reduce emissions from deforestation and degradation, manage forests sustainably, strengthen conservation, and enhance forest carbon stocks.^b This includes its involvement with the Forest Carbon Partnership Facility (FCPF), the Forest Investment Program (FIP) of the Strategic Carbon Fund, the United Nations REDD Programme, and the REDD+ Partnership.

At the national level, MINAM is in charge of coordinating Peru's REDD+ preparations and efforts to seek international

financing to sustainably manage its forests. The FCPF approved Peru's REDD Readiness Preparation Proposal in 2011. In May 2014, Peru and the Inter-American Development Bank, in its capacity as administrator of the FCPF's Readiness Fund, entered into a technical cooperation agreement for US \$3.8 million to support implementation of a national REDD+ strategy, stakeholder engagement, evaluation of land use change and land tenure, forestry emission baselines, and development of a forest monitoring system.²² Peru calculated that for the REDD+ preparation phase it needs US \$12 million so it also sought US \$2 million from the Moore Foundation and US \$7.5 million from Germany's KfW development bank.²³

For its REDD+ implementation phase, Peru is working with the FIP to access up to US \$50 million in grants and near zero interest financing for an investment plan that will test integrated landscape management mechanisms in three priority geographic areas and strengthen forest conservation policies, institutions and instruments. The three target geographic regions are the Tarapoto-Yurimaguas route in the San Martín and Loreto regions, Atalaya in Ucayali region, and the Puerto Maldonado and Iñapari in the Amarakaeri Communal Reserve.²⁴ Peru is also seeking funds to support REDD+ efforts through bilateral channels.²⁵ For example, Norway recently pledged to pay up to \$300 million to support emission reduction projects that cut deforestation in the Amazon region. Under the agreement, which runs through 2021, Norway would make payments for verified emission reductions that start in 2017.²⁶

There are also numerous REDD pilot projects already advancing. One example is a project in the Parque Nacional Cordillera Azul that is protecting 1,351,963 hectares of forest through more rigorous park protection and engagement with communities and stakeholders. The project is estimated to generate net emission reductions of more than 18 million mt CO₂e over its initial 10-year baseline period. In 2013, the park was reported to maintain a zero percent net deforestation rate with 99.97 percent of its forests intact.²⁷

FORESTRY CLIMATE COMMITMENT OUTLOOK

Peru demonstrated significant international leadership when it announced the ambitious target of net zero deforestation. This goal should translate into making progress on addressing small-scale agriculture, the largest single driver of deforestation in the country, and preventing other drivers that contribute to forest loss from continuing to expand unchecked. For instance, as market forces increase the profitability of expanding productive and extractive activities into forest lands, it will be essential for Peru to continue to build and implement a coherent policy

^b We utilize the terms REDD and REDD+ interchangeably to refer to the broad concept that goes beyond reducing emissions from deforestation and forest degradation and also includes the role of sustainable forest management, enhancement of carbon stocks and biodiversity conservation.

and regulatory framework that can shield its forests from demand for commodities. Two examples of how domestic and international market demand are impacting Peru's forest can be seen in the cases of illegal small-scale gold mining in Madre de Dios and oil palm plantations in Loreto (see sidebars Small-scale illegal gold mining in Madre de Dios and Expansion of monoculture agriculture in Loreto, respectively).

Peru's challenges are significant and decision-makers will need to demonstrate strong political will to overcome a history of weak governance, poor synchronization between multiple agencies, and the legacy of development policies such as forest colonization and construction of major energy and transportation infrastructure that contributed to deforestation.²⁸

Going forward, one of Peru's most important tasks will be to ensure cohesive planning and coordination between departments and agencies. At least four separate entities currently have roles and responsibilities related to forests. At the regional level, and as part of the decentralization process, certain governments have assumed authority over the forests in their jurisdictions and are in charge of managing and controlling them. Where there are concessions and forest usage rights in place, activities are supervised by the Monitoring Agency for Forest Resources and Wildlife (OSINFOR), an autonomous body under the Council of Ministers. Meanwhile, the Ministry of Environment's National Service of Natural Protected Areas (SERNAP) manages the forests under the national protected area system. The

newly consolidated Forestry and Wildlife National Service (SERFOR) under the Ministry of Agriculture and Irrigation is the national forestry authority and is tasked with defining the public forestry policies, overseeing forest resource management when necessary and coordinating with other bodies and regional governments.²⁹ It is critical to successfully bridge the distinct objectives of these different agencies and levels of government. For example, while some agencies are focused on forest management and use from the perspective of promoting agriculture or regional development, others are focused on biodiversity protection or emissions reduction.

In addition to strengthening communication between these and other stakeholder agencies, Peru should continue to develop a shared vision and toolkit for land-use planning over time. For example a key step is the development of an accurate and up-to-date forest inventory to help strengthen land-use planning and resolve unclear land tenure issues, including with indigenous communities. Another important tool is a system to monitor deforestation to verify that emission reductions are actually taking place. Peru has already started to implement this through a project promoted by the Amazon Cooperation Treaty Organization to set up deforestation "observation rooms" in Amazon Basin countries, indicating it is taking the right steps to develop necessary capacity.³⁰ The availability of precise and reliable forest data should be the basis for developing coherent forest use policies and regulations.

Small-scale illegal gold mining in Madre de Dios



The case of the Madre de Dios region illustrates some of the challenges to Peru's forestry sector goals. As the global price of gold climbed, illegal small-scale gold mining in Madre de Dios skyrocketed as highway construction helped bring an influx of miners from other regions of the country. In addition to exposing communities in Madre de Dios to toxic mercury pollution, a by-product of the mining process, by 2012 this activity had contributed to the loss of 50,000 hectares of forest, up from 10,000 hectares in 1999.³¹ Illegal small-scale gold mining is not limited to Madre de Dios, however. Across Peru, the total forest degradation and loss associated with this mining could now exceed 100,000 hectares according to some estimates.

Peru's government has been working since 2009 to address the illegal small-scale mining problem. Policies were put in place to "formalize" miners by bringing them into the legal fold and to prohibit the sale of materials and equipment used for illegal mining. When found, materials are confiscated or destroyed ("interdiction"). A mining exclusion zone is also in place in Madre de Dios and a special "High Commission" was established to implement interdiction and formalization activities. Despite these efforts, the problem in Madre de Dios persists. The biggest challenges are often the limited availability of resources and weak coordination between different levels of government and agencies.

To address this ongoing health and ecological crisis, Peru must continue to bolster and implement regulations on small-scale gold mining. It remains important to strengthen efforts to formalize miners and create alternative livelihoods—and develop mechanisms to effectively control key inputs, such as mercury. The government should also plan for mining exclusion zones outside of Madre de Dios to prevent illegal activity from infiltrating other regions. It should also consider putting a freeze on granting additional mining concessions until a land use planning process is finalized.

Expansion of monoculture agriculture in Loreto

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While most agriculture in the country still occurs on small-scale plots, agro-industry is growing and could change the dynamic of deforestation in the Peruvian Amazon. One example is the expansion of oil palm plantations, which have increased from a total area of 14,667 hectares in 2000 to approximately 60,000 hectares today. The growth of this sector is in part a response to growing demand domestically (Peru is a net importer of vegetable oils for household products, food stuffs, and biodiesel) and the potential to eventually supply the international palm oil market.

Much of the land used for palm cultivation is worked by small-scale producers, but large producers that can operate projects of some 10,000 hectares each are becoming more common. Approximately one third of oil palm production is

now in the hands of the Peruvian firm, Grupo Palmas. This company along with other corporations—including some from Malaysia where there has been extensive forest clearing for palm oil production—have already requested permits to plant oil palm on at least an additional 90,000 hectares. The head of Grupo Palmas has projected that by 2020 the total area planted with oil palm could double and eventually reach 250,000 hectares.³² This growing participation of corporate players with greater access to capital and markets means forests can be cleared at a faster rate and larger scale than before. Data from 2000-2010 shows that 72 percent of new plantations in that time frame were established on forested land. More recent reports and satellite imagery show that since 2013, over 2,000 hectares have been illegally deforested and planted with palm.³³

Part of the problem is legal ambiguity for agroindustry, including loopholes that allow forestland to be categorized as apt for agriculture. In addition, land use change is authorized by regional governments that may not have the necessary tools, data, or capacity to determine where such activity would be most appropriate. To prevent the unfettered expansion of oil palm into primary forests, Peru must continue to strengthen regulation and oversight, as well as ensure that land-use decisions are based on accurate information about the state of forestlands.

MOVING TOWARD CLEAN ENERGY

Peru's energy sector is responsible for 30 percent of the country's emissions, making it the second largest emissions driver after deforestation—energy-related emissions contributed 47 MtCO₂eq to the atmosphere in 2011.³⁴

Demand for energy is growing steadily in Peru with total energy consumption increasing from 10.604 million tonnes of oil equivalent (Mtoe) in 2000 to 15.092 Mtoe in 2010.³⁵ According to a business-as-usual prediction by the Asia-Pacific Economic Cooperation forum, total energy demand (excluding that from international transportation) will more than double between 2010 and 2035.³⁶ Under this scenario, industry demand will grow the most with increasing use of electricity and natural gas during production. Energy demand from the transport sector will see the second largest growth as the number of vehicles on the road is estimated to increase by 250 percent by 2035. A rapid increase in electricity demand across other sectors would also contribute to the overall demand for energy.

Peru meets its energy demand primarily with a combination of large hydroelectric and gas-fired power plants for electricity, and imported oil and gasoline for transportation. In the face of a continued rise in energy demand, there are important opportunities for Peru to deploy lower carbon energy options, including renewable energy for electricity generation, energy efficiency, and low-emission transportation solutions.

CLIMATE COMMITMENT: PRODUCE 40 PERCENT OF ENERGY FROM NON-CONVENTIONAL RENEWABLES AND HYDROELECTRICITY

Peru's primary effort related to climate change in the energy sector is to shift its energy mix away from a reliance on oil. In March 2010, Peru announced its intention to modify its energy matrix so that at least 33 percent of the energy consumed in the country would come from renewable energy. The following year it showed a willingness to be even more ambitious when it clarified that through a mix of efficiency and renewable energy (including large-scale hydropower) it would aim for an energy matrix based on 40 percent renewables by 2021.³⁷

Peru has abundant renewable energy resources that can help meet this target, according to preliminary estimates.³⁸ The country could potentially tap into up to 22,000 MW of wind energy and approximately 3,000 MW of geothermal energy. Peru also has significant solar resources along its southern coast where annual average daily irradiation is approximately 250 watts per square meter. As Peru continues to increase energy access and rural electrification, renewable energy can help meet the energy needs of communities that still lack access to a modern power source.



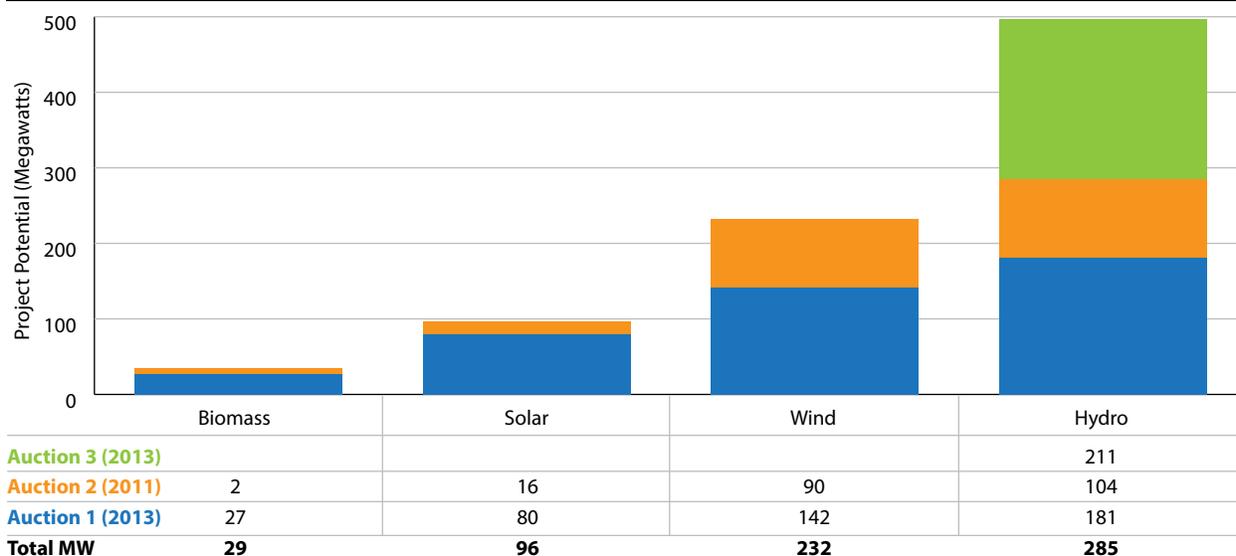
Peru has several policies and programs relevant to its energy sector mitigation goals:

A. Renewable energy production target and incentives

In 2008, Legislative Decree 1002 mandated that the Ministry of Energy and Mines (MINEM) set a renewable energy production target every five years. For the first five-year period between 2008 and 2013, the goal was to generate up to 5 percent of the country's electricity demand with renewable energy resources (RER), defined as solar, wind, geothermal, tidal, biomass, and small hydroelectric power up to 20MW. Decree 1002 also called for renewable energy research and for MINEM to develop a National Renewable Energy Plan, in line with Regional Renewable Energy Plans.³⁹

Peru has also established various mechanisms to support renewable energy. Notably, Decree 1002 mandates priority dispatch and access to the transmission and distribution grid for electricity generated from renewable energy resources. Projects also qualify for accelerated depreciation of up to 20 percent for their investments in equipment, machinery, and civil works under Decree 1058.⁴⁰ Renewable energy is also eligible for early recovery of the general sales tax from electricity sales.⁴¹

Renewable Energy Auction Adjudications in Peru for Grid Connected Sources



B. Renewable energy auctions

Peru launched an auction system for renewable energy resources in 2009. Contracts are based on the lowest tariff per kWh on a technology basis and prices are guaranteed for 20 years. To date there have been three auctions for grid connected sources. In December 2013, Peru launched its first auction for electricity supply in areas that are not connected to the national grid and this is currently in the adjudication stage.⁴²

During the first auction, a total of 1,972 GWh were adjudicated across 27 projects totaling 430 MW of installed capacity: solar (80MW), wind (142 MW), biomass (27 MW), and small-hydro (181 MW). Twenty-one of these projects totaling 236 MW are already operating. The second auction adjudicated 1,153 GWh across 10 projects representing 212 MW of installed capacity: solar (16 MW), wind (90 MW), biomass (2 MW), and small-hydro (104 MW). Currently under construction, these projects are expected to operationalize between 2014 through 2016. A third auction for 1,620 GWh of biomass and small hydroelectric generation adjudicated 1,278 GWh to 16 small hydroelectric projects totaling 211 MW.⁴³

C. Prioritizing renewables for rural electrification

Expanding rural electrification with clean power sources achieves the dual goals of moving toward a cleaner energy mix and helping to meet the country's development objectives. According to MINEM's General Office of Rural Electrification (MINEM-DGER), at the end of 2013, an estimated 90 percent of the population nationwide had electricity. In contrast, only 70 percent of rural residents had access to electric power.⁴⁴ The country's 10-year National Rural Electrification Plan (2014–2024) aims to expand access to electricity to an additional 5.2 million people and in areas where grid interconnection is not possible, the plan prioritizes distributed photovoltaic installations, small-scale hydroelectric plants, and wind power. MINEM's General

Office of Rural Electrification (MINEM-DGER) is currently implementing six solar-based rural electrification projects to reach 6,930 households and has identified additional rural households that could be served by deploying solar photovoltaic systems.⁴⁵ The renewable energy auction for off-grid service launched last year is in the process of adjudicating contracts to supply non-grid connected photovoltaic service to up to 500,000 users for a period of 15 years.⁴⁶

D. Increasing Energy Efficiency

In its 2000 Energy Efficiency Promotion Law, Peru recognized that energy efficiency is in the national interest. The government further reiterated the policy importance of this resource in the 2010–2040 National Energy Policy, calling for greater efficiency in the production chain through efficiency targets, incentives for companies and consumers, and demand side management among other things.⁴⁷ MINEM's 2009–2018 energy efficiency plan identifies a series of actions to boost efficiency across key sectors that, if implemented, could help move Peru toward a target of 15 percent energy savings below a projected 2018 demand baseline.⁴⁸ According to the plan, this would conceivably cut CO₂ emissions by up to 35 million metric tons. Based on the plan's projections, most energy efficiency gains would come from reduced biomass use in cookstoves, improved transportation efficiencies, boiler upgrades, and cogeneration. Efficiency in the electricity sector could also shave off 600 MW of demand by 2018.

Energy efficiency is also at the center of Peru's most advanced proposed nationally appropriate mitigation action (NAMA), which is focused on promoting efficient lighting technology among the residential, public, commercial and industrial sectors. The potential cumulative emission reduction benefit from this NAMA would be 4,409.789 mt CO₂eq over 10 years which would be achieved by cutting power demand by 2,779 MW and energy consumption by 80,109.2 GWh per year.⁴⁹

E. Biofuels production

Peru established a legal framework for a biofuels market in 2003 to meet a variety of goals including diversifying its fuel sources, strengthening the agricultural sector, creating employment and alternative livelihoods, and reducing pollution. In 2007 it issued a biofuel blending mandate that currently calls for 5 percent biodiesel in diesel mixes and 7.8 percent ethanol in gasoline.⁵⁰

Biofuels production in Peru is still a new sector and distributors comply with the blending mandate by importing a significant amount of their inputs. This is particularly true for biodiesel for which production peaked in 2013 at 56 million liters, less than 20 percent of total consumption. But production of biofuel inputs is expanding. According to a commodity assessment by the U.S. Department of Agriculture, Peru's two main ethanol producers currently have approximately 14,800 hectares planted with sugar for ethanol production. The assessment notes that the Peruvian government expects that an additional 45,000 hectares or more could be planted to meet the anticipated increased demand for ethanol fuel as vehicle ownership expands.^{51,52} As noted earlier, oil palm that can be used for biodiesel production is grown on some 60,000 hectares in the Peruvian Amazon and there are plans for even more.

ENERGY CLIMATE COMMITMENT OUTLOOK

While a precise resource inventory must be developed, the outlook for renewable energy in Peru is very promising and renewable energy resources could potentially be the country's fastest growing new source of energy over the coming decades. Between 2006 and 2013, Peru saw \$3.4 billion in clean energy investments and currently 7.8 percent of Peru's 10 GW of installed capacity is comprised of renewable energy.⁵³ According to a strategic energy study for the 2010–2040 period commissioned by MINEM, Peru has the potential to meet 20 percent of its total electricity demand in 2040 with RER resources. Based on preliminary assessments of resource availability, the study projected approximately 4,321 MW of installed capacity that could be met with geothermal (34.7 percent), wind (31.1 percent), biomass (14.4 percent), mini-hydro (11.5 percent), and solar (8.3 percent).⁵⁴

However, strong national policies and strategic implementation are critical to effectively move Peru toward its clean energy target. A key step is to define a clearer, long-term roadmap for the renewable energy sector. Currently a renewable energy resource requirement is set on an auction-by-auction basis, but there is no defined long-term plan for scaling up renewables. The 5 percent renewable energy target for 2008–2013 was met ahead of schedule in 2010. A revision was expected in 2013, but the target has yet to be updated. It is essential for Peru to develop, in a participatory and transparent manner, the National Renewable Energy Plan called for by Decree 1002. Clear targets and goals for



renewable energy integration will provide a stronger signal and greater certainty to the industry. A well-defined plan for renewable energy will also help determine the most appropriate auction design to achieve particular policy objectives. Peru must also plan and operate its current and future transmission and distribution grid to optimize renewable energy integration.

To achieve the full savings and greenhouse gas emission reduction potential from energy efficiency, Peru must also ramp up efforts and support for the sector. Despite noting the importance of this resource in various policies and plans, there is significant room for improvement. A 2011 assessment of progress on MINEM's efficiency plan found that 102 of the actions identified had not advanced; and of the remainder, only two had progressed between 51–100 percent. Key barriers included limited funding and human resources.⁵⁵ As Peru moves forward with planning for efficiency and other NAMAs, it will be critical to ensure these efforts have sufficient capital and human resources.

Equally essential is the need to ensure that the expansion of renewable energy options, both for power generation and transportation, avoids environmental and social conflicts. New infrastructure and projects must be planned and sited to avoid lands that are important ecologically or culturally. For example, while biofuels are meant to help reduce greenhouse gas emissions, Peru's biofuels mandate has raised concerns about the potential impact on forests, food security, and access to water. Additionally, while the use of biofuels is one means of reducing pollution from transportation, biofuel crops that are planted on wetlands or primary forest can actually result in net increases in greenhouse gas emissions.⁵⁶ The production of inputs for biofuel production must not come at the expense of forests and people's livelihoods, and instead prioritize the use of degraded land.

CONCLUSION

The emissions mitigation goals Peru presented in the international climate arena indicate a willingness to work proactively toward solving global climate change. Yet implementation of these goals ultimately falls to one or more individual ministries and agencies that are not necessarily part of the global climate dialogue and that have their own set of priorities. Peru's leaders should work to bridge efforts at these two levels of governance just as the country has tried to help find common ground between developing and developed countries. It is also important to ensure these ministries and agencies receive the support and tools needed to boost local implementation capacity.

On the forestry side, Peru made the ambitious commitment to reduce the net deforestation rate in primary forests to zero. To this end, Peru is creating a framework to protect 54 million hectares of forest and is actively participating in REDD+ mechanisms. To achieve its goal, Peru will need to make measurable progress in addressing historic drivers of deforestation like small-scale agriculture, as well as address factors that emerge partly in response to growing market demand for commodities, as illustrated by cases like mining and large-scale agriculture. To be successful

Peru must strengthen cross-institutional coordination and planning, improve oversight and ensure agencies have the right tools and data on which to base land use planning decisions.

To address energy sector emissions, Peru has pledged to transform its energy matrix so that 40 percent of its total energy comes from renewable and hydroelectric sources. Peru has already taken numerous positive steps, including creating an auction system, establishing a renewable energy target, and setting incentives for renewable energy to help boost clean energy options. Nevertheless, Peru must continue to define a clearer path for renewable energy and energy efficiency with more concrete targets and timelines. As it moves toward lower carbon energy choices, it is important for Peru to plan, construct, and operate energy projects to avoid environmental and social conflicts. This includes any expansion of biofuel production capacity, which must not occur at the expense of forests, food, or communities.

Looking toward 2020, Peru's challenge will be to continue to mainstream climate action into everyday environmental governance and resource management. Setting Peru on a low carbon path should be broadly recognized as a priority not just for the global climate agenda, but as a means for fulfilling the nation's development aspirations.

About NRDC

The Natural Resources Defense Council (NRDC) is an international non-profit environmental organization dedicated to research and advocacy activities. Founded in 1970, NRDC uses law, science, policy expertise and the support of 1.4 million members and online activists to protect the planet's wildlife and wild places, and to ensure a safe and healthy environment for all living things. NRDC works on projects in the United States, Canada, Latin America and Asia, as well as on global initiatives addressing issues such as climate change, energy, toxic waste, oceans, water, air and health.

In Latin America, NRDC works with partners on the ground to help develop solutions to some of the most pressing sustainability challenges. We collaborate with allies in civil society, academia, and the public and private sectors in an effort to combat, climate change, protect the region's natural resources and foster low-carbon communities. Learn more about NRDC at www.nrdc.org.

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Acknowledgements

NRDC wishes to thank Cristina Córdova and Robert Youngs for their research assistance on this document.

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