INTERNATIONAL TRADE ADMINISTRATION

2016 Top Markets Report Environmental Technologies Regional Supplement

FTA South America

Home to 34 percent of the world's plant and 27 percent of mammal species, South America contains five of the world's 10 most biodiverse countries. Its nations are faced with harmonizing internal and external pressures to establish strict environmental protection regimes with pursuit of economic development and efficiency. Over the past decade, a commodity boom pulled millions out of poverty, but it also triggered a scramble for oil, minerals and cropland. Common environmental challenges include deforestation, soil erosion, severe urban air pollution, water scarcity and vulnerability to climate change. In recent years, an increasing number of South American nations have adopted more comprehensive legal frameworks and stronger environmental policy regimes to try to address these issues. This has boosted demand for environmental technologies and, together with the relatively free flow of goods and services trade between the United States and its Free Trade Agreement (FTA) partners, helps to make U.S. environmental solutions much sought-after in these markets.

Regional Market Overview

Over much of the past decade, Chile, Colombia, Mexico and Peru have been some of the Americas' fastest-growing emerging markets, with GDP growth at an average annual rate of 4 percent or higher through 2014. The United States currently maintains free trade agreements (FTAs) with all of these countries, and bilateral FTAs with three: Chile, Colombia and Peru. The U.S.-Chile FTA went into force in 2004 and all duties on U.S. originating goods entering Chile were eliminated on January 1, 2015. Over 80 percent of U.S. originating consumer and industrial products exported to Colombia became duty free when the U.S.-Colombia Trade Promotion Agreement (TPA) entered into force on May 15, 2012, with the remaining 20% to follow within 10 years. The Peru Trade Promotion Agreement entered into force on February 1, 2009, with similar provisions. All three trade agreements include strong commitments to protect the environment. For example, in all three cases, both parties have agreed to effectively enforce their own domestic environmental laws.

In addition to bilateral FTAs with the United States, Chile and Peru are also parties to the Trans Pacific Partnership Agreement (TPP), which has the highest environmental standards of any trade deal. Chile, Peru and Mexico are U.S. partners in the TPP, along with 8 other countries (Australia, Brunei Darussalam, Canada, Japan, Malaysia, New Zealand, Singapore, and Vietnam). The 12 TPP partners together represent 40 percent of the global economy. The TPP Agreement was concluded in October 2015 and signed in February 2016 and is currently undergoing ratification in each of its partner countries. The TPP Agreement upgrades the environmental provisions in the FTAs with Mexico, Chile and Peru. Strong environmental regimes drive demand for environmental technologies, and all parties to TPP must commit to the environmental requirements in order to participate. FTAs help to facilitate trade in environmental goods and services through both amplifying this key market driver and eliminating tariffs on environmental goods, thus increasing competitiveness of U.S. technologies in partner markets.

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Together with steady projected industrial and economic growth, improved regulatory frameworks and enhanced capacity for many environmental and enforcement agencies in the region, these markets offer strong prospects for U.S. environmental technology and service providers.

Regional Market Opportunities: Water

The water and wastewater market serving the expanding Latin American mining industry is set to grow by 3.3 percent to USD 4.9 billion over the next six years as mining firms look to maintain production in the face of mounting environmental and demographic challenges. Spending on process water management (including water reuse) is expected to see the highest levels of growth in the next six years, with a CAGR of 5.4 percent, followed by growth in investment in wastewater treatment. Global Water Intelligence's (GWI) report estimates that capital spending in the water for the mining market in Latin America will be around USD 4.0 billion in 2014, with expenditure in the water supply sector representing around 46 percent of this figure. This percentage is expected to decrease to around 41 percent by 2020, with growing investment in the process water and wastewater sectors. Civil engineering infrastructure (including pipelines) is the component of the water for mining market with the single highest expenditure, which in 2014 is estimated to be just under USD 2.8 billion. In the equipment sector, seawater desalination systems are expected to experience the highest growth, with a CAGR of 10 percent in the period of 2014 to 2020. This compound annual growth rate is distorted, however, by the high cost of large individual desalination projects. Treatment methods and management systems that favor water recycling are expected to show the highest growth after seawater desalination systems in the Latin American market, with a CAGR of 5.5 percent in the period 2014 to 2020. The four main markets for mining in Latin America are Chile, Peru, Brazil and Mexico.[1]

Water sector investment in Latin America needs to grow by 300 percent in order to achieve a satisfactory level of services by 2025, although this figure is likely to rise as climate change adaptation requirements are increasingly taken into account.

This prognosis, calculated by Corporación Andina de Fomento (CAF), takes as its basis the fact that only 7 percent of the region's wastewater is treated, while 27 percent of periurban dwellers lack adequate water supply but do not incorporate costs associated with mitigation measures to counteract the effects of the severe water; shortages currently affecting northern Mexico, central Chile and Brazil's São Paulo region.[2]

Market Barriers

FTAs with Chile, Colombia, Peru and Mexico have significantly reduced or eliminated the vast majority of tariff and non-tariff market barriers for U.S. exports to these countries. Areas to note include:

1. **Intellectual Property Rights (IPR) Protection and Enforcement**
   The U.S. Trade Representative's Special 301 Report is an annual review of the state of IPR protection and enforcement in U.S. trading partners. Despite strong FTA IPR protection provisions, Chile, Colombia, Peru and Mexico all were included on the 2015 Special 301 Watch List due to certain weaknesses in the adequacy and/or effectiveness of their IPR protection regimes. Common issues included the prevalence of pirated or counterfeit goods and the lack of coordination among enforcement agencies.
2. **Corruption**
   Most countries in the region are perceived to be highly corrupt. In Transparency International's 2015 Corruption Perceptions Index, the only three countries in Central and South America that scored above 50 on a scale from 0 to 100, with 100 being extremely clean, were Costa Rica (55), Chile (70) and Uruguay (74).

Chile

Air Pollution Control

Most of Chile's population centers are located in between two mountain ranges - the Andes and the Cordillera de la Costa. This unique geography favors the creation of weather patterns that generate a stable layer of air near the earth's surface, allowing thick smog to stagnate over Santiago and other urban areas, particularly in fall and winter. In summer, nitrogen oxide emissions (NOx) and volatile organic compounds (VOCs) from mobile as well as non-anthropogenic

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sources boost the formation of ground-level ozone (O3).[3]

The Ministry of Environment (MMA) currently maintains air quality standards for seven criteria pollutants (SO2, O3, NO2, CO, PM10, PM2.5 and lead (Pb)) and is in the process of revising its requirements for all except PM 2.5 and Pb. The current PM 2.5 standard, enacted in 2012 through the Primary Standard on Fine Inhalable Particulate Matter PM2.5, is set at a daily maximum concentration of 50 milligrams per cubic meter air ($\mu g/m^3$) and an annual maximum concentration of 20 $\mu g/m^3$.[4] Areas where the pollutant concentrations are between 80 and 100 percent of the set air quality standards are designated as "latent" non-attainment areas, while areas where the pollutant concentration exceeds the set standard are "saturated" non-attainment areas. These designations form the basis of the atmospheric prevention plans (APP) and atmospheric contamination plans (ADP), respectively.[5]

Air pollutant concentrations that consistently register above standard levels in Chile's northern urban and mining zones are largely a result of the high levels of SO2 and PM 10 from copper foundries and coal-fired power plants. In the central region of the country, PM 10, O3 and SO2 from mobile and point sources are of primary concern, and in the south, the key issue is PM 10 produced by residential wood combustion.[6] The mining, iron, steel, cement and wood product industries also impact air quality.[7]

In September 2014, Chile approved a carbon tax for thermal power generators (thermal input equal to or above 50MW, biomass power plants exempt), which is set to take effect in 2017. Emitters will have to pay USD 5 per metric ton of CO2 they emit, as well as a to-be-determined taxes on other GHG emissions.[8] The government also has promulgated financial incentives for businesses to introduce technologies and processes that promote "clean" production, such as the Clean Production Agreement (*Acuerdo de Producción Limpia*). An update of the National Action Plan for Climate Change (2016-2020) is also underway, which will help continue to guide development of policies and regulatory frameworks that will be favorable for producers of technologies that support the country's adaptation and mitigation targets.

Key Technologies in Demand:

- Continuous emissions monitoring equipment
- Ambient air quality monitoring equipment
- Source emission measurement technologies
- Particulate matter control systems (particularly new bagging systems)
- Wet/dry scrubbers (particularly systems that remove multiple pollutants)
- Dry sorbent injection technologies
- Flue gas desulfurization equipment
- Activated carbon injection technologies
- Inspection, adjustment, maintenance and repair services
- Selective catalytic reduction technologies
- Selective non-catalytic reduction controls
- Urea to ammonia reagent systems
- Electrostatic precipitators (wet and dry)

Waste Management and Recycling

Chile's generation of municipal solid waste (MSW) has increased significantly over the past decade, on pace with the country's steady population growth, rising living standards and increasing GDP per capita. Chilean municipalities are responsible for collecting and disposing of their own waste. Most decide to award contracts to collection agencies that transport it to privately managed landfills. According the Ministry of Environment, of the 17 million tons of solid waste that are generated each year, 33 percent is recoverable, but only about 10 percent is currently recycled.[9] In general, the municipalities' contracts with collection agencies offer no incentive to reduce waste, as municipalities typically agree to pay less per ton based on increasing volume. The newly approved Extended Producer Responsibility (EPR) law should improve the recovery rate of at least nine classes of products: lubricating oils, electrical and electronic equipment, periodicals, packaging, pharmaceuticals, tires, batteries, expired pesticides, and vehicles.[10] Most in-country producers and importers of these products will need to upgrade their processes and technologies to ensure compliance.

Hazardous waste, including chemical powders and toxic liquids, must be transported to one of seven special treatment sites. About 5 percent of hazardous waste is converted into alternative fuels, while the rest is buried in leak-proof containers. Hazardous waste is tracked through an online System for Declaring and Monitoring Hazardous Waste (SIDREP); however, enforcement can be challenging.[11]

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Industry projections for solid waste management in Chile indicate that between 2014 and 2018 investment by the private and public sector will exceed USD 30 billion.[12]

Key Technologies in Demand:

- Composting equipment
- Sorting machines
- Crushing and grinding machines
- Materials handling equipment
- Collection services, containers and vehicles
- Recycling process expertise
- Waste-to-Energy technologies
- Landfill gas recovery
- Sanitary landfill design and associated technologies (especially liners and covers)

Water and Wastewater Treatment

Municipal Water Treatment and Supply

16.1 million are served, 94.8 percent of which by private operators[13].

Key Technologies in Demand:

- Engineering, procurement and construction services
- Filtration
- Advanced filtration
- Chemical disinfection
- UV disinfection
- Ozone disinfection
- Pumps, pipes and valves
- Storage technologies
- SCADA systems
- In-line monitoring systems
- Trenchless technologies

Municipal Wastewater Treatment and Sludge Management

The Chilean public water market is governed by the Public Works Ministry (MOP), which manages water resources, grants concessions and provides water for the rural population.[14] Chile privatized urban water and wastewater resource management in 1989 through the General Law for Water and Sanitation Services (DFL MOP 382/1988). [15] In 1998, Chile created the world's most liberal water market by further privatizing the underlying utility assets and property. Prior to 1998, water concessions remained the property of the government.[16] As a result, 94.8 percent of the population is served by a private water and wastewater company,[17] which cumulatively serve 5 million metered homes daily in urban areas.[18]

U.S. exporters seeking to work in Chile's municipal market must go directly to the private water providers to identify opportunities and project pipelines. Major property holding water companies include Aguas Cordillera, Aguas Manquehue, Essal, Esval, Essbio and Aguas Andinas.[19] Concessionaire companies include: Nuevosur, Aguas Magallanes, Altiplano, Aguas Patagonia, Aguas Chañar, Aguas Araucanía, Aguas Antofagasta and Aguas del Valle.[20] The largest water company consortia is led by the Agbar-Suez economic group, which holds Aguas Cordillera, Aguas Manquehue, Aguas Andinas and Essal and serves 42.9 percent of the market. Other major economic groups include the Ontario Teach Pension Plan, which holds Essbio, Esval, Aguas del Valle and Nuevosur with 36.2 percent of the market, and the Marubeni group, which holds Aguas de Altiplano, Aguas Araucanía and Aguas Magallanes, with 9.2 percent of the market. [21]
Key concerns of Chilean water companies include managing water scarcity with efficient technologies, storage, reducing non-revenue water, and energy efficient treatment and transmission technologies. [22]

Key Technologies in Demand:

- Engineering, procurement and construction services
- Primary and secondary treatment technologies
- Advanced filtration
- Membrane filtration
- UV / Ozone disinfection
- Waste-to-energy technology
- Anaerobic digestion
- Nitrification
- Biological denitrification
- Sludge handling equipment
- Smart meters
- Non-revenue water control software
- Low-loss distribution equipment
- Storage equipment
- Monitoring equipment
- Testing equipment

Desalination

In order to address water scarcity in the arid north, Chile is developing a series of reverse osmosis sea water desalination facilities. The central government

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plans to invest USD 280 million in the next five years.[23] There are eight major salt water conversion projects currently in the project pipeline. Major opportunities include the Aguas Chañar project of the Aguas Chañar utility (38,880 m^3/D), the Arica project of MOP (17,000 m^3/D), the Copiapó project of Econssa (80,000 m^3/D), the Desaladora Sur project of Aguas de Antofagast (51,840 m^3/D) and the Aguas Atacama project of Agbar (86,400 M^3/D).[24]

Key Technologies in Demand:

- Engineering, procurement and construction services
- Primary and secondary treatment technologies
- RO membrane filtration
- UV / ozone disinfection
- Monitoring equipment
- Testing equipment

Process and Produced Water

Chile's mining industry has created one of the largest global markets for process and produced water. Chile's mines are located in the country's water-scarce north, which has created water resource development challenges for the mining sector. Mining companies must procure sufficient water supply for both production and to meet the human consumption needs of communities living in the region. Similar to utilities, the mining sector is turning to large-scale desalination and reuse to meet demand.[25] The mining industry expects consumption to increase 66 percent by 2025 and plans to meet increasing demand by desalinating 36 percent of its total process consumption by 2025.[26] Ten major industrial desalination projects are in the pipeline, including the Relincho Copper Mine project valued at USD 3.5 billion for initial phase (60,480 m^3/D), the El Abra Mine project (112,320 m^3/D), the Mejillones desalination and distribution project valued at USD 292 million (86,400 m^3/D), and the Dominga RO project (42,840 m^3/D).[27]

Key Technologies in Demand:

- Engineering, procurement and construction services
- Primary and secondary treatment technologies
- RO membrane filtration
- UV / ozone disinfection
- Monitoring equipment
- Testing equipment

Market Links and Contacts

Commercial Service Santiago
www.export.gov/chile

Ministry of Environment
http://portal.mma.gob.cl/

Andess Chile – Chilean Water Company Association
http://www.andess.cl/

Ministry of Public Works
www.mopo.cl

AEPA Environmental Association
www.aepa.cl

Superintendencia de Servicios Sanitarios
www.siss.gob.cl
Dirección General de Aguas
www.dga.cl

Cochilco
www.cochilco.cl

Chilean Municipalities Association – ACHM
http://www.munitel.cl/

Assoc. of Mining Industry Suppliers – APRIMIN
http://aprimin.cl/site/

Plastics Association – ASIPLA
http://www.asipla.cl/

Environmental Directory – Induambiente
http://www.induambiente.com/

Commercial Events

IFT Agro
www.ift-agro.cl
Expomin
www.expomin.cl
Aquasur
www.aqua-sur.cl
Exponor
www.exponor.cl
Fullplast Chile
http://www.fullplast.cl/
Expomin
http://www.expomin.cl/

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Colombia

Air Pollution Control

Over the past decade, Colombia has made substantial progress toward effective air pollution management. The 2010 Air Pollution Control and Prevention Policy in particular made progress in air quality assessment, monitoring, standardization of air quality inventories, fuel-quality improvement, and implementation of incentive programs for environmental control and monitoring.[28] The capital city, Bogota, has 14 active air quality monitoring stations, most of which measure particulate matter (PM 10), ozone and nitrogen dioxide, and some also measure sulfur dioxide. Just one monitors PM 2.5. Approximately 90 percent of the city's air pollution is attributed to mobile sources.[29] The government is making efforts to address the issue, through stricter emissions regulations as well as other measures. Most recently, Resolution 1111 (2013) established that all light- and heavy-duty vehicles must adhere to Euro IV emissions standards as of 2015.

Environmental management via the country's National Environmental System (SINA) is complex and challenging, particularly for priority issues such as air quality, as full implementation of SINA necessitates collaboration and information sharing and production across 33 regional autonomous corporations with highly variable levels of capacity, accountability and funding.[30] Colombia is Latin America's largest coal producer and fourth largest exporter of oil. Extractive industries, particularly those for fossil fuels and gold, as well as power plants and agricultural burning, are significant contributors to air pollution. In general, emissions standards for industrial and thermal sources are outdated and/or poorly enforced. The government recently has placed greater emphasis on promulgating policies that support sustainable growth, including in its 2010 to 2014 and 2014 to 2018 National Development Plans (DNP). There is likely to be low demand for air pollution control technologies without the introduction of updated emissions standards, stronger institutional accountability and increased incentives to comply with environmental regulations.

Key Technologies in Demand:

- Ambient air quality monitoring equipment
- Source emission measurement technologies
- Emissions control technologies for motor vehicles and non-road (diesel) vehicles and machinery

Waste Management and Recycling

According to a recent report by the World Bank, around 79 percent of the 27 tons of solid waste that Colombia's cities generate every day is disposed of properly in landfills. One-fifth of Colombian municipalities located predominantly in rural areas do not have adequate waste disposal, and approximately 30 percent of the country's landfills are not properly managed and do not comply with environmental regulations.[31] Informal recycling is a key feature of Colombia's municipal waste management system. Approximately 26,000 informal and independent recyclers (*recicladores*) account for an estimated 55 percent of all recycled municipal waste and help to balance the lack of source separation in cities and towns.

Title 2 of Decree 1077 (2015) sets the general regime for the management of conventional solid waste, including storage and disposal rules, while Title 6 of Decree 1076 sets forth rules for handling, storage and treatment of hazardous waste, including obligating generators to prepare a complete Hazardous Waste Management Plan, as well as to register as a hazardous waste generator with the relevant environmental authorities. Public utilities are charged with collecting and transferring municipal solid waste to disposal sites. The Ministry of Environment also recently has issued regulations regarding collection and management of several types of household hazardous waste, including pesticides, acid lead batteries, pharmaceuticals, batteries, tires, light bulbs, and electrical and electronic consumer products.[32]

Extractive industries are major sources of soil pollution in Colombia. The country's Antioquia administrative department registers as the world's largest mercury polluting area per capita, largely due to the prevalence of small-scale artisanal gold mining there.[33] The adoption of Law 1658 in 2013 is an important step toward mercury reduction, as it aims to phase out the use of mercury in mining within five years and in all production processes within 10 years. As of 2016, Colombia lacks a coherent national framework for land contamination management, but increasing concern for environmental and ecosystem protection has brought the issue greater prominence and is likely to support positive regulatory and policy developments in this area.

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Key Technologies in Demand:

- Sorting machines
- Crushing and grinding machines
- Materials handling equipment
- Collection services, containers and vehicles
- Waste handling equipment
- Waste treatment technologies
- Brownfield site remediation design and equipment
- Soil contamination testing and monitoring equipment

Water and Wastewater Treatment

Municipal Water Treatment and Supply

Colombia is initiating an effort to introduce functional Public Private Partnerships (PPPs) in its water sector. Legal changes to the PPP law in 2012 have paved the way for greater private sector participation in the water sector by delineating clear guidelines for the deployment of PPPs in the water and sanitation sector. [34] The Colombian government has planned to invest USD 6.3 billion water projects between 2015 and 2018, noting that approximately 30 percent is expected to be financed privately. [35]

Colombia's interest in encouraging greater private sector participation in the water sector is part of a broader government strategy to improve urban water quality, restore major tributaries such as the Bogotá River, and expand sanitation services and sludge treatment universally. [36] The preeminent opportunity is the development of the Canoas wastewater treatment plant of Empresa de Acueducto y Alcantarillado de Bogotá (EAAB). Upon commissioning, the Canoas project will be the largest wastewater treatment facility in the Andes with a daily capacity of 1.2 million m^3 and an estimated total project value of USD 883 million. [37]

On March 17, 2015, the Ministry replaced a 30-year-old regulation with Resolution 0631, which establishes the maximum allowable pollution limits from point sources to superficial bodies of water and public sewer systems. Resolution 0631 aims to reduce pollution loads to improve water quality and calls for more advanced industrial and municipal treatment processes. Up to 3.5 years transition compliance time has been afforded to the 73 production activities in the country. The resolution is available online at: www.minambiente.gov.co/images/normativa/app/resoluciones/d1-res_631_marz_2015.pdf

Key Technologies in Demand:

- Engineering, procurement and construction services
- Filtration
- Advanced filtration
- Chemical disinfection
- Pumps, pipes and valves
- Primary and secondary treatment technologies
- SCADA systems
- In-line monitoring systems
- Sludge disinfection systems
- Sludge dewatering and drying systems
- Anaerobic digestion
- Bio-gas/natural gas recovery
- Nitrogen and phosphorus recovery technologies

Market Links and Contacts

Ministry of Environment
www.minambiente.gov.co

Ministry of Housing and Territorial Development
http://www.minvivienda.gov.co/viceministerios/viceministerio-de-agua

Acueducto de Bogotá
www.acueducto.com.co

Commercial Service Bogotá
www.export.gov/colombia

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Peru

Air Pollution Control

The World Health Organization (WHO) recently named Lima the Latin American city with the worst air pollution. According to the WHO, the average concentration of PM 2.5 and PM 10 registered between 38 and 63 micrograms per m^3 on average, which is far in excess of the maximum levels (10 and 20 micrograms per m^3, respectively) recommended by the organization. Lima's aging public transit vehicle fleet and low fuel quality are key contributors to the city's poor air quality. As Susan Villaran, former mayor of Lima, highlighted during a hearing before Congress "52 per cent of Lima's [12,050] buses and *combis* (smaller buses) are over 20 years old".[38] Lima's geography also helps to keep the smog in place. The city of 9 million is bordered on the west side by the Pacific. Ocean currents push the pollution eastward and inland, where it is blocked by the Andes.

In the country's urban and industrial areas, petroleum extraction and refining; natural gas extraction and liquefaction; mining for gold, copper, lead and zinc; steel, metal and cement production; textiles; and chemicals industries all impact Peru's air quality. Regulations are in place for some sectors, such as cement and smelting, while others, such as thermal power plants and brick production, remain under discussion.[39]

According to a forward-looking 2012 Country Report by the Ministry of Environment (MINAM), "the national environmental authority must complement pending regulations related to atmospheric protection and must implement supervisory activities, monitoring and strengthening the governance of atmospheric protection actions." Relevant supporting actions include strengthening and expanding air quality monitoring networks and implementing maximum permissible limits (LMP) in new regulations.[40]

Key Technologies in Demand:

- Fenceline monitoring equipment
- Continuous emissions monitoring equipment
- Ambient air quality monitoring equipment
- Source emission measurement technologies
- Fuel vapor control technologies
- Emissions control technologies for motor vehicles and non-road (diesel) vehicles and machinery
- Selective catalytic and non-catalytic reduction controls
- Particulate matter control systems
- Wet/dry scrubbers (particularly systems that remove multiple pollutants)

Waste Management and Recycling

According to a report by the Agency for Environmental Assessment and Enforcement (OEFA), as of 2014, there were just nine sanitary and two secure landfills in Peru. Moreover, outside of Lima, sanitary landfills are located in only four of the 25 regions (provinces), so much of the mountainous country does not have access to them. Lima alone generates over 7,400 tons per day, or about 41 percent of Peru's total, and that amount is expected to more than double over the next two decades. The Ministry of Environment (MINAM) estimates that 81 percent of total solid waste is collected and transported to landfills, and that the country needs at least 100 landfills to manage all of its solid waste properly.[41]

The General Law on Solid Waste (Law No. 27314) and Supreme Decree No. 057-2004-PCM together provide the primary legal and regulatory framework for solid waste management. Provinces and district municipalities are responsible for handling their residents' waste, and each province must develop and implement its own plan under the Solid Waste Environmental Management Program (PIGARS). The OEFA monitors compliance with their environmental enforcement functions. National policy is guided by Peru's 10-Year National Environmental Action Plan, which sets an ambitious 2021 goal of ensuring adequate treatment and disposal of 100 percent of the nation's urban solid waste (Plan, Section 7.2).[42] The government is actively pursuing financing to help realize these goals, including from international institutions. In 2012, the Inter-American Development Bank (IDB) and the Japan International Cooperation Agency (JICA) provided loans "to support the development of 31 sustainable and efficient systems for managing solid waste in Peru."[43]

Key Technologies in Demand:

- Composting equipment
- Sorting machines
- Crushing and grinding machines
- Materials handling equipment
- Collection services, containers and vehicles
- Recycling process expertise

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- Waste handling equipment
- Waste treatment technologies
- Sanitary landfill design and associated technologies (especially liners and covers)

Water and Wastewater Treatment

Municipal Water Treatment and Supply

With just 86.7 percent of Peruvians with access to a safe drinking water source and 76.2 percent with access to sanitation services, much remains to be done in terms of water and wastewater infrastructure.[44]

Similar to other Latin American countries, Peru is turning to Public Private Partnerships (PPPs) to close the finance gap for public infrastructure, improve the service quality and meet universal access goals. In Lima alone, USD 15.8 billion is needed to improve and expand service delivery.[45] The preeminent opportunity for PPP in the water sector is the suite of zone based projects for Lima (including Lima Central, Lima South and Lima North projects) being developed by ProInversión, Peru's investment agency.[46] The program aims to increase revenue through improved metering and by developing operational efficiencies in process such as installing energy efficient pumping systems.[47]

The government has also committed to restoring Lake Titicaca by 2025 with the development of as many as 10 wastewater treatment plants in the Lake Titicaca region. Cumulatively, those projects in both Peru and Bolivia focus on rehabilitation of Lake Titicaca are valued at USD 500 million.[48]

Key Technologies in Demand:
- Engineering, procurement and construction services
- Primary and secondary treatment technologies
- Anaerobic digestion
- Nitrification
- Filtration
- Advanced filtration
- Chemical disinfection
- UV disinfection
- Ozone disinfection
- Pumps, pipes and valves
- Storage technologies
- SCADA systems
- In-line monitoring systems
- Leak detection equipment

Process and Produced Water

Water for mining is also a substantial market opportunity in Peru. Several major mining related projects are in the pipeline, including the Los Calatos Reverse Osmosis Plant, which has an expected value of USD 650 million, to treat process and produced water for the copper-molybdenum mining project led by Metminco.

Key Technologies in Demand:
- Primary and secondary treatment technologies
- Advanced filtration
- Membrane filtration
- UV / ozone disinfection
- Waste-to-energy technology
- Anaerobic digestion
- Nitrification
- Biological denitrification
- Sludge handling equipment
- Monitoring equipment
- Testing equipment

Market Links and Contacts

Ministry of Environment
http://www.minam.gob.pe/

Agency for Environmental Assessment and Enforcement (OEFA)
www.oefa.goeb.pe

U.S. Commercial Service - Lima
http://www.export.gov/peru

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