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Officials Inaugurate Solar-Powered System for Wastewater Treatment Plant in Sonora

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The city of Nogales in Sonora became the first community in Mexico to install a system to power a wastewater treatment plant entirely with energy obtained from the sun. The facility, known as Los Alisos, will be powered by an array of 3,900 photovoltaic cells installed in an area of 15,000 square meters. The plant has the capacity to treat 220 liters of sewage per second.

Los Alisos is one of a handful of facilities in North America that are powered by solar energy. Similar plants exist in the US cities of Auburn, California, Boulder, Colorado, Gresham, Oregon, Galena, Illinois, and Upper Marlboro-Germantown, Maryland. Developers in the Ruhr region of Germany have also installed a solar-powered wastewater treatment system.

The construction of Los Alisos was promoted by the administration of former Gov. Guillermo Padrés Elías, a member of the conservative Partido Acción Nacional (PAN). However, the installation of the solar-powered system took place during the administration of Gov. Claudia Pavlovich Arellano, a member of the governing Partido Revolucionario Institucional (PRI). Funding for the solar system came primarily from the Mexican federal and Sonora state governments, although the US Environmental Protection Agency (EPA) provided a little more than 8% of the investment of 82.8 million pesos (US$4.5 million) needed to install the system.

“I am very pleased that this photovoltaic water treatment plant, the only one in the country, is located in our state,” Pavlovich Arellano said at the inauguration ceremony in late May. Officials noted that the solar-powered facility is also the only one of its kind in Latin America.

Significant savings
A major benefit of solar power is a reduction of about 70% in the operation and maintenance of the wastewater treatment plant. According to Pavlovich Arellano, the use of solar power will help the operator of the facility save about 500,000 pesos (US$27,000) monthly.

The savings will enable the plant to operate continuously, unlike other facilities in Mexico that sometimes have to shut down temporarily because of a lack of operating funds, said Francisco Muñiz Pereyra, a deputy director with the government’s water utility (Comisión Nacional del Agua, CONAGUA).

CONAGUA officials said the federal government would seek to encourage other wastewater treatment facilities around the country to convert to solar power. “The future of wastewater treatment plants is in photovoltaic cells,” CONAGUA director Roberto Ramírez de la Parra said at the inauguration ceremony, which was also attended by Nogales Mayor David Cuauhtémoc Galindo Delgado.

The Los Alisos plant was inaugurated in 2012. It was constructed with funding from CONAGUA and the North American Development Bank (NADB) to help take some of the pressure off the Nogales
International Wastewater Treatment Plant (NIWTP) in Rio Rico, Arizona, and to allow the city of Nogales, Sonora, to provide treated water to more of its homes and neighborhoods.

“This helps so that they have water in the colonias,” Padrés Elías said during the inauguration ceremony. “It’s a system and process that allows us to take a qualitative step to make Nogales a model at the state and national levels, and in Latin America.”

The project, built at a cost of US$19.3 million, included the construction of the treatment plant in the Los Alisos Basin, as well as the installation of a conveyance system with a pump station.

NADB, which was created via the North American Free Trade Agreement (NAFTA) in 1994 (SourceMex, April 6, 1994), provided a loan of US$3.24 million to help finance construction of the treatment plant, as well as a US$8 million grant that was applied toward the construction of the Estadio pump station and a 10-mile long gravity main. CONAGUA and the Sonora state government provided the remaining funds.

Some of the wastewater collected in Nogales continues to be sent about nine miles north of the border to the NIWTP facility, which has the capacity to treat up to 14.7 million gallons a day (mgd) of flows. Of that amount, 9.9 mgd is allocated to Mexico. However, prior to the construction of the Los Alisos plant, the NIWTP was receiving average wastewater flows of 12.5 mgd from Mexico, a situation that created major stress to the treatment system during peak demand.

“With this vital project, Nogales is addressing wastewater treatment needs that have steadily increased as a result of population growth in the region,” Alex Hinojosa, NADB deputy managing director, said in 2012. “Thanks to the coordinated efforts of the governments of Mexico and the United States, the Nogales International Wastewater Treatment Plant in Rio Rico, Arizona, will no longer be called upon to handle excess sewage flows from Mexico.”

**Solar projects scarce**

The installation of the photovoltaic panels in the Nogales plant is an important step in the promotion of solar power in Mexico. Some projects have been installed in recent years, including the Aura Solar I photovoltaic plant in Baja California state (SourceMex, April 2, 2014) and the Agua Prieta II integrated solar combined-cycle (ISCC) power plant in Sonora in 2015. The ISCC combines energy from a Concentrated Solar Power (CSP) plant and a natural gas-fired Combined Cycle (NGCC) power plant. The ISCC aims to reduce the costs of solar energy for electricity generation.

Construction of the Agua Prieta II plant, which includes a 464.4MW combined-cycle power plant and a 12MW solar field, was supported by Global Environment Facility (GEF) of the United Nations’ Development Program (UNDP).

Even with the recent construction of the Aura Solar 1 and the Agua Prieta II facilities, critics contend that President Enrique Peña Nieto’s government is not doing enough to promote solar energy, considering the strong potential in some areas of Mexico (SourceMex, Dec. 2, 2015).

One of the fiercest critics of the Peña Nieto government’s lack of commitment to solar power is the Asociación Nacional de Energía Solar (ANES), which notes that solar energy meets less than 1% of the country’s electricity needs (SourceMex, April 11, 2012). ANES points out that the administration’s goal of obtaining 35% of the country’s power from clean sources by 2024 includes very few solar power projects.
A major concern for ANES is a 15% tax that the government imposed on imports of photovoltaic panels in 2014, a move targeted primarily at China. Mexico’s import tax mirrors similar tariffs imposed in 2012 by the US and the European Union on photovoltaic panels from China, which is one of the largest producers of components for solar energy. The solar panels are heavily subsidized by the Chinese government, and the cheap imports tend to discourage development of a local industry.

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