GOOD NEIGHBOR ENVIRONMENTAL BOARD

Presidential advisory committee on environmental and infrastructure issues along the U.S. border with Mexico

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President Donald J. Trump
The White House
1600 Pennsylvania Avenue, NW
Washington, D.C. 20006

Dear Mr. President:

As your federal advisory committee for environmental and infrastructure issues along the United States (U.S.) border with Mexico, the members of the Good Neighbor Environmental Board (GNEB) are pleased to provide this evaluation of the context as well as challenges and opportunities for the energy sector in the U.S.-Mexico border region. The energy sector will be important in the future quality of life for residents in the border region and will have economic impacts on the U.S. and Mexican economies. The political and regulatory environment for border energy and the bilateral energy trade is currently in flux, with a new Mexican presidential administration and the United States-Mexico-Canada Agreement (USMCA). GNEB's report describes the socio-economic context of the border region and discusses features of border energy, and highlights opportunities and barriers for energy investment and trade and associated environmental interests. The Board will follow these themes through 2019 as energy policies and regulations evolve and are implemented, and GNEB will issue a more detailed report on border energy at the end of 2019. The 2019 report also will include specific recommendations for federal policies and actions.

1. Summary

The demand for energy within the U.S. border region will likely grow significantly in the future, driven by population growth, economic development, and greater demand for cooling and for moving and treating water due to historically increasing average ambient temperatures. There is significant potential for energy development in the U.S. border region in the areas of natural gas, crude oil, and

renewables. At the same time, cross-border energy trade has the potential for growth as the result of natural gas production in the U.S. and constitutional and regulatory changes in Mexico for its energy sector. An additional factor will be the development of renewables in Mexico and the potential for increased electricity export to the U.S. These probable changes present opportunities for trade and investment and improving energy security and quality of life. They also present significant challenges due to inadequate infrastructure, potential environmental impacts, and U.S. and Mexican regulations that require, for example, presidential permits for cross-border energy projects. Border energy also will be affected by any changes in the recently signed USMCA as it moves toward legislative approval in the U.S., Canada, and Mexico. Finally, Mexican energy policy likely will change under the new administration of President López Obrador.

2. The Border Context

The U.S.-Mexico border region is defined as the area stretching 62.15 miles (100 kilometers) from either side of the international boundary. Socioeconomic data are available for U.S. counties and Mexican municipalities contiguous with the international border. The U.S. border region with Mexico is different from other regions in the U.S. These differences include rapid economic and population growth; rapid urbanization; shared natural resources such as rivers, groundwater, and airsheds; economic, cultural, and political differences and asymmetries with Mexican communities across the border; burgeoning international commerce and trade flows; high rates of poverty; and diverse ethnic identities. Overall, the Southwest border is poorer and more urbanized than the rest of the nation. These features all present challenges that regions located within the interior of the U.S. often do not have to overcome.

Since the 1940s, the population of the 10 U.S. and Mexican border states has grown more rapidly than the national averages and, at the same time, the populations of the counties and municipalities along the border have grown faster than the states in which they are located. Driven by internal migration, the populations of Mexican municipalities have usually grown at twice the rate of their U.S. counterparts. By 2010, some 14.4 million people resided in U.S. border counties and Mexican border municipalities. By 2020, border population is projected to reach 19.5 million. Most of the border's population resides in 15 paired U.S. and Mexican inter-dependent sister cities, including seven along the Texas border with four Mexican states. Of the 26 U.S. federally recognized Native American Tribes in the border area, some have tribal members living in adjacent areas of Mexico and several occupy large reservations along the international boundary. Hispanics constitute the largest ethnic group in the border region, are the largest minority group in the U.S., and are a majority of the population in 19 of the 24 counties along the international border with Mexico. In 2015, 82 percent of the population of the border counties was Hispanic, excluding San Diego and Pima counties where the corresponding percentages were 33.9 and 37.3 percent.

The 24 U.S. counties bordering Mexico (again excepting San Diego County, California, and Pima County, Arizona), would rank 51st—or dead last among U.S. states—in poverty rate; percentage of persons under 65 without health insurance; high school or higher graduates; and per capita income. In some cases, the differences are staggering: for example, only 69.1 percent of residents of these counties over age 25 are high school graduates, compared to 84 percent for the U.S. overall. All these are indicators of poverty. The border region is where poverty and ethnicity coincide. It also is where the population is harmed by the health effects of deteriorated environmental conditions.

Due to rapid urban growth and scarce infrastructure funding, U.S. and Mexican border communities have chronic deficits of basic urban services, including potable water, sewage treatment, and solid waste disposal. In areas of the U.S. border region, principally in Texas and New Mexico, but also in Arizona and California, *colonias*—residential communities in rural areas of counties lacking basic services such as water, sewage, electricity, and often paved roads—developed without standard infrastructure. In Texas alone, the Texas Secretary of State found that in 2014 nearly 38,000 residents in the six largest border counties with *colonias* lacked potable water or sewer services.

Although the North American Free Trade Agreement (NAFTA), beginning in 1994, produced a large increase in trade and investment, it did not create widely shared prosperity in U.S. border communities. NAFTA stimulated commerce and created many jobs along the border, but those jobs tended to be low-skill and low-paying, while U.S. border communities lost higher paying assembly and manufacturing jobs that moved into Mexico and elsewhere offshore. Trade growth brought increased vehicular crossings that saturated the border infrastructure and overwhelmed communities along the major trade corridors with increased air pollution, producing health as well as safety concerns. Regions throughout the U.S. benefited from the growth of NAFTA-related trade and investment, yet border communities absorbed a disproportionate share of the environmental costs related to congestion. Federally funded programs associated with NAFTA, such as the North American Development Bank (NADB), as well EPA's Border XXI, Border 2012, and Border 2020 programs as part of the 1983 La Paz Agreement, addressed many border potable water and wastewater issues, but those programs have not been adequately supported in recent years. Continued urban growth on both sides of the border and aging infrastructure have produced a sanitary crisis in many border communities. In San Diego, for example, chronic renegade flows of untreated wastewater from across the border have created dangerous working conditions for border law enforcement personnel and continue to produce beach closures, with economic and health consequences for local communities.

Air quality in the border region is affected by pollutants from a number of sources. Motor vehicles, power plants, industrial facilities, agricultural operations, mining, dust from unpaved roads, and open burning all affect urban and regional air quality along the U.S.-Mexico border. The most common and harmful pollutants from these

sources include suspended particulate matter (PM_{10} and $PM_{2.5}$) and ground-level ozone.

Although substantial improvements have been made, air quality is still a major concern throughout the border region. The pressures associated with industrial and population growth, differences in governance and regulatory frameworks across the border, and topographic and meteorological conditions combine to present a challenging context in which to address air quality management. Although the number of days exceeding the ozone and particulate matter standards have decreased over the past decade, congestion at ports of entry (POE) adversely affects air quality in the surrounding sister cities. In addition, some U.S. and many Mexican border cities, including Ciudad Juárez, lack a robust air quality monitoring program. Without basic air quality data, effective policies cannot be implemented to resolve public health issues.

Other Factors

A number of national parks in both countries, including Big Bend National Park in Texas and the Maderas del Carmen Biosphere Reserve in Mexico as well as Organ Pipe Cactus National Park and El Pinacate and Gran Desierto del Altar Biosphere Reserve in Mexico, are spectacular and remote. Other large areas of the border region are protected and managed by federal, state, or local agencies as well as nonprofits. Of the 1,954 miles of the boundary, almost 780 miles (40%) are along U.S. Department of the Interior lands. Texas has the most land along the border that is in private hands, although the Big Bend National Park, other federal lands, and state parks are important. Deserts, mountains, and riparian areas help provide significant diversity in plant and animal species and contribute to ecotourism. The border has areas of great natural beauty and value. Some of these areas are compatible with energy development and transmission; others are problematic.

The natural environment and climate of the border region provide many challenges for environmental quality and sustainability of communities. The border is mostly arid and water is an extremely limited resource in many parts of the border region. Population growth—along with growth in agriculture and other economic activities including energy production—places increasing stress on water quantity and quality. The historic ambient temperature increases and long-term drought point to continuing declines of fresh water supply in the border region. Protecting the quantity and quality of water sources is important for ecological, human, and economic health in the region.

The impacts of a changing climate on energy supply, delivery, and demand are also of concern, especially for the border region where the projected changes in energy expenditures will likely be among the highest in the nation by the end of the century. For example, the 4th National Climate Assessment (2018) notes three significant issues: how the nation’s energy system is already being affected by extreme weather events; how changes in energy technologies, markets, and policies are

affecting the energy system's vulnerabilities; and the actions already being taken or considered to enhance energy security, reliability, and resilience.

3. U.S. and Mexico Border Energy Contexts

The U.S. and Mexico are two major energy exporting and importing countries with significantly divergent energy histories, institutions, and regulatory regimes. In fact, just recently, the U.S. became the largest oil and gas producer in the world and a net exporter of oil. The two countries also are energy partners, deeply engaged in a system of cross border energy interdependence in terms of production and transmission.

Broadly speaking, the U.S. system is characterized by private property rights, a substantially open market for producers, highly regulated transmission, and local energy management in the form of public and private utilities. The Mexican system, in contrast, until very recently was characterized by federal ownership of production and transmission. The reforms passed by Mexico's Congress in 2014 opened up numerous areas of energy production and related areas to foreign firms. However, Mexico's new administration, led by President Andrés Manuel López Obrador (or AMLO, as he is known), has recently halted auctions of production rights for the next 3 years. Clearly, Mexico has entered a new period of energy policy.

The history of U.S.-Mexico energy trade has been marked by U.S. private and public utility exchange with the Mexican government entities of Petróleos Mexicanos (PEMEX) and the Federal Electricity Commission (CFE, in Spanish). From an institutional standpoint, the U.S.-Mexico border brings together two different regimes: one almost completely national (Mexico) and the other highly decentralized (U.S.). Mexico ranks third on the list of countries from which the U.S. imports petroleum. In fact, U.S. companies import and refine Mexican oil and then export it back to Mexico. This serves as a prime example of U.S.-Mexico energy *inter*dependence.

The U.S.-Mexico border features different types of energy production and transmission at an impressive scale. To begin with, the states of California and Texas are enormous producers and consumers of both fossil fuels and renewable energy that exert tremendous force on energy markets. Three U.S. border states are in the top five in terms of oil and gas production: Texas (ranking first with 38% of the U.S. production), California (5%), and New Mexico (5%). The state of Texas also is a renewable energy powerhouse, producing the most wind power of any U.S. state, and if it were a country would rank sixth in the world in installed capacity. California, which has for some time been in the forefront of adoption of renewable energy standards and policies, imports both wind power and natural gas-generated electricity from Baja California and power generated at Arizona's Palo Verde Nuclear Generating Station (3.3 GW), the largest producer of electricity in the U.S. Mexico's six border states lead national production statistics in multiple types of renewable energy, including wind, solar, geothermal, and biomass.

In summary, the U.S.-Mexico border region exhibits both an impressive scale and breadth of energy production and exchange. Although energy and energy trade present great opportunities for the region, they also bring challenges.

California-Baja California Energy Issues

The California-Baja California portion of the U.S.-Mexico border is distinct from the rest of the border region in significant ways that impact the energy sector. The region is the most populous section of the border with a projected population of more than 9 million people by 2020. San Diego is the largest and wealthiest of any of the cities along the border, and California itself has the largest population and economy of any of the border states.

The energy sector in California also is quite different from the other U.S. border states. California is a leader nationally in achieving energy efficiency savings. Opportunities exist for sharing California's energy efficiency technologies and best practices with states on both sides of the border to reduce electrical demand and lower impacts on customer utility bills as demand for electricity—based on increasing needs for cooling, increased development, and other factors—becomes more prevalent. Enhanced energy efficiency of structures also can improve indoor air quality and help ameliorate air pollution impacts along the border.

Baja California also is different from the other Mexican border states. Its most striking feature is lack of connectivity of Baja California's electricity, gasoline, and natural gas systems to the rest of Mexico. In this sense, Baja California is an "energy island."

The energy sector in California is under the jurisdiction of two state agencies, the California Public Utilities Commission (CPUC) and the California Energy Commission (CEC). The state has embraced using renewable energy to generate electricity and is required by Senate Bill 100 (SB 100) to have a carbon-free electric sector by 2045. This requirement will be the driving force behind how the power sector develops in California and, in turn, how California will interact with Baja California in the electric sector. For its part, Mexico also has aggressive targets for using renewable energy in the coming decades. Unless current policies are changed, Mexico intends to have 35 percent of its electricity sector powered by renewable sources by 2024.

A major development, with significant environmental implications, would be the construction of a high-voltage transmission line linking Baja California to mainland Mexico. Such a transmission line has been considered in Mexico for many years and advanced planning is underway, so it is possible that such a line could become a reality during the next decade. Should this be the case, Baja California would depend less on energy imports from California and could receive energy from the mainland and from renewable projects that are being developed in the neighboring

state of Sonora, Mexico. Installation of the transmission line would also allow the development of renewable projects in Baja California to send renewable energy to other Mexican states or to the U.S.

Another major element to consider is the growing view that Baja California can become an energy exporter to California utilizing its significant wind and solar potential. If large-scale wind and solar projects are developed in Baja California, a ready market exists in California for the resulting electricity, especially as California law allows imported renewable electricity from Mexico to be counted toward a utility's Renewable Portfolio Standard (RPS).

One area where expanded energy use in Baja California is expected is for water supply and treatment. Availability of potable water is a critical issue for Baja California and the associated energy requirements to provide that water will be a major factor in the continued growth of this region. For example, the fast growing region of Tijuana on Baja California's Pacific coast depends on water from the Colorado River that is pumped over high mountains, which requires large amounts of electrical energy.

At this time, all indications are that a robust and market-driven energy sector will emerge between California and Baja California with, for the first time, Baja California acting as a net supplier rather than a user. Moreover, the electricity that is exported to California will likely come from relatively clean renewable sources. The two most important factors determining energy trade and investment in the California-Baja California region are the renewable energy policies of both California and Baja California and the present status of Baja California is an energy island.

Texas-Mexico Energy Issues

There is significant energy interdependence between Texas and Mexico. For example, Ciudad Juárez, distant from many Mexican oil refineries, receives its gasoline and diesel via pipeline under the Rio Grande from El Paso. In addition, much of the U.S. natural gas exports to Mexico now are delivered through pipelines from Texas. Two pipelines carrying U.S. natural gas exports to Mexico were placed into service in June 2018, one carrying gas from the Eagle Ford shale region in Texas to Monterrey, Nuevo León, and another from the Permian basin in West Texas to areas in western Mexico. In previous GNEB reports, electricity interconnects between Texas and Mexico have been noted.

Mexico Energy Issues

In Mexico, the growth of LNG (liquefied natural gas) has been significant since 2008; however, the lack of gas distribution infrastructure in Mexico is contributing to a supply problem. Although an increase in Mexican pipeline infrastructure would drive down the cost of electric generation, installation of a gas pipeline across

northern Mexico between Chihuahua and Sonora has run into siting problems and local opposition. Because domestic natural gas production is flat and President López Obrador's is opposed to fracking, Mexico likely will continue to rely on imports from the U.S. Growth in demand for natural gas will continue in the northwestern and central parts of Mexico with the expansion of industrial uses. Excess capacity, however, does exist in the import infrastructure.

Electricity demand in Mexico is projected to grow 3.1 percent annually over the next 15 years. However, there is little confidence that CFE will reduce electricity rates, which should decline due to natural gas generation and market forces. There will also be additional investment in renewable energy.

Pillars of the energy reform under Mexico's Peña Nieto administration included the independence of CENACE (National Center for Energy Control) and keeping CFE in the role of infrastructure developer. This leveled the playing field and introduced efficiency. The administration also increased the renewables standard for electricity to 35 percent by 2015, up from its current level of 26 percent. In the future, the focus on renewables will be larger in scale. For example, plans exist to install 1,000 EV (electric vehicle) charging stations to support the goal of 100,000 EVs.

4. USMCA and Energy Trade and Investment

The USMCA affects energy and related investment across numerous areas, most notably in sections dealing with Investor State Dispute Settlement (ISDS), the sunset provision, market access, and Mexican ownership of hydrocarbons. The ISDS was largely written out of the USMCA with the exception of the oil and gas and a few other industries. The new sunset clause also is being examined by industry analysts mindful of the long-term nature of energy investments.

Protection is provided for investors in the Mexican energy sector, which has increased significantly since the 2014 Mexican energy reform. ISDS, generally scaled back from robust provisions in NAFTA, includes exceptions for the oil and gas, transportation infrastructure and services, and power generation sectors. This was specifically included in the USMCA for Mexico.

There is some concern about the sunset provision of the new agreement, which was not included in NAFTA. The agreement includes a 16-year sunset provision if it is not renewed or renegotiated, with a review process every 6 years that would allow for extensions.

While the Environment section of the USMCA states that environmental laws should not be used "in a manner which would constitute a disguised restriction on trade or investment between the Parties," the section also notes that "the Parties recognize that it is inappropriate to encourage trade or investment by weakening or reducing the protection afforded in their respective environmental laws." Finally, Chapter 8, titled "Recognition of The United Mexican States' Direct, Inalienable, and

Imprescriptible Ownership of Hydrocarbons" is important for the López Obrador Administration as it takes Mexico into a new period of energy policy change.

The USMCA still requires legislative ratification in all three countries. Although the ratification process is a yes or no vote, there is always the chance that one legislature could refuse to ratify and request modifications. If approved, most provisions of the USMCA would go into effect in 2020.

5. The New Mexican Administration of President López Obrador and Evolving Mexican Energy Policy

The new AMLO administration has expressed interest in achieving energy self-sufficiency. That would require reducing gasoline and other energy imports from the U.S. and increasing domestic production. Postponing retirement of aging fossil fuel plants or adding new coal-fired plants has been considered, including two 700-MW units in Coahuila.

Modernizing hydroelectric projects also has surfaced in discussions, which would require significant capital investment. Gas storage is another challenge facing the new administration. Other tasks include controlling pricing and improving the efficiency of PEMEX and the Federal Electricity Commission. Socializing the cost of these projects among off-takers, or purchasers, has been suggested, but PEMEX has shown little interest in this to date. The private sector may be the best developer of such projects, assuming off-takers can be secured.

6. Challenges and Opportunities for Border Energy Development and Trade

The U.S. has the opportunity to increase its offerings of products and technologies in virtually all sectors of Mexico's energy industry. Mexico has shown substantial interest in diversifying its sources of power generation to include more renewables, adding natural gas-powered generation, and updating existing power generation plants with new technology to offer cleaner and more efficient generation. The 2014 Mexican energy reform has allowed international companies the opportunity to develop, construct, own, operate, and sell in the Mexican electricity market. It is expected that expansion of the electric grid and natural gas pipeline system will continue. Due to Mexico's increasing reliance on natural gas for power generation, there have been significant natural gas pipeline projects, increasing imports from the U.S. to Mexico. There continues to be a large underserved population in terms of energy in regions of Mexico and expansion of the grid to these areas will be a high priority. Mexico has committed to some 1.7 billion pesos (~90 million U.S. Dollars) for investment in power generation, with two thirds in clean energy projects and one third in conventional technology projects. Those dollars represent an array of technologies to be implemented. There also will be investments in transmission and distribution systems from additional sources. These projects have encountered opposition of environmentalists and indigenous groups who believe that siting and

construction impacts to the environment and their culture have not been properly evaluated. There also is concern about domestic energy independence in Mexico.

Mexico's recent energy reform allows foreign companies the opportunity to develop, construct, own, operate, and sell electricity through purchase power agreements into the Mexico grid, mainly with renewables. It is anticipated that the number of these agreements will grow over the next several years in line with the renewable goals that Mexico has established. This will likely have an impact on the U.S. renewable energy market.

The U.S. border region with Mexico occupies a strategic location in U.S.-Mexico energy relations. Increasing border energy production and transmission of energy across the international boundary will present challenges for the U.S. border region. The footprint of additional generation and transmission infrastructure will be significant. A challenge will be to facilitate the necessary energy infrastructure in ways that are efficient and also protect the environment and quality of life of border residents. Finally, a key concern for border residents is that energy developments of the region should contribute to the prosperity of border communities.

7. Summary and Next Steps

This letter of the GNEB has summarized the socio-economic context of the U.S. border region with Mexico. Distinct energy systems of Texas and California have been noted along with connections to energy systems in Mexico. U.S.-Mexico energy trade and investment interactions have been discussed in the face of two significant changes. First are the energy, trade, and investment provisions of the USMCA. Second, are the unfolding elements of Mexican energy policy and regulations under the new administration of President López Obrador. Given the dynamic nature of the bilateral energy trade, the GNEB will follow elements outlined in this letter and will include a robust analysis with specific recommendations for federal agencies in its report that will be delivered in December 2019.

The GNEB looks forward to receiving your response to this letter that will serve to help guide our efforts for 2019.

Sincerely,

Paul Ganster, Ph.D.
Chair
Good Neighbor Environmental Board