



Briefing Paper

Prepared for San Diego Dialogue's Forum *Fronterizo* program on:

Energy Opportunities in Baja California

July 2001

by

Federico M. Ruanova-Guinea, Partner, Baker & McKenzie
José M. Larroque, Partner, Baker & McKenzie

This briefing paper was prepared for San Diego Dialogue's Forum *Fronterizo* series on "Improving the Global Competitiveness of San Diego/Baja California," which is underwritten by Sempra Energy, The San Diego Union-Tribune and the Public Policy Institute of California.



EXTENDED STUDIES AND PUBLIC PROGRAMS
UNIVERSITY OF CALIFORNIA, SAN DIEGO
9500 GILMAN DRIVE 0170-D • LA JOLLA, CALIFORNIA • 92093-0170
858 / 534-8638 • FAX: 858 / 622-4842 • www.sandiegodialogue.org

I. The Opportunity¹

Baja California faces a huge opportunity for economic development arising out of the energy sector. The key is for Baja California to offer industrial investors a long-term supply of power that is more secure, reasonably priced and ample than much of the rest of Mexico is able to offer. Mexico generally faces a growing shortage of natural gas and power, and investors are already reacting to this uncertain power and gas availability.

To seize this opportunity, Baja California needs first to secure a liquid natural gas (LNG) import facility, since U.S. gas alone may not assure adequate long-term availability and cost. Besides, competition and multiple sources are always more reliable, and they are seen as such by industrial investors seeking the right location.

Second, Baja California needs to assure its electric power generators that they can sell directly to industrial customers in Baja California as well as export and also sell to Comisión Federal de Electricidad (CFE). CFE claims this can already be done under creative use of permitted sales to “related companies,” but an explicit legal right would be better.

Finally, Baja California needs to facilitate expansion of gas and power transmission infrastructure between Baja California and California.

All of this energy infrastructure in Baja California – LNG landing facilities, power generators, gas and power transmission – will attract financing because of the export component.² The export component is Baja California’s key to building the capacity to offer uniquely reliable, ample, reasonable cost power and gas to industrial investors in Baja California. Every Baja California official should have this on the state’s calling card with international and Mexican export-oriented investors.

There are also great benefits to Baja California in the construction and operation of these energy facilities themselves. These are huge projects, adding up to as much as several billion dollars, with lots of jobs in construction and operation, as well as revenues on the transmission of exported volumes.

Baja California’s domestic economy needs lots of power. Consumption of power is growing 7% per year, which means a doubling in a decade. By 2010, Baja

¹ Paul Boeker, President, Institute of the Americas, has provided these comments.

² For a list of energy projects under way in Baja California please refer to Appendix A

California will need at least 2,800MW of power capacity, versus 1455MW today, just for domestic needs. The export market is going to make it possible to finance that power investment, and to bring the gas to fuel it.

The prospect is thus for Baja California's productive integration with California to deepen significantly in the next decade – much to Baja California's benefit.

II. The Challenges³

Environmental Permitting Issues.

One of the concerns of State and Municipal government agencies in Mexico is that there is very little coordination with Federal authorities when it comes to environmental permitting of large infrastructure projects. This is particularly the case with regards to power plants and natural gas distributors.

The General Law of Ecological Balance and Environmental Protection (the "Ecology Law"), Mexico's main environmental law, states that power plants and gas distribution facilities require a federal authorization prior to their construction and operation. From a strict legal standpoint, State and Municipal authorities do not have much of a role in reducing or minimizing the environmental effects that a large power plant may have on local communities. Municipal authorities, however, do have the power to regulate land use and are empowered to revoke a land use permit if certain environmental requirements are not met.⁴

Under the Ecology Law, the Ministry of Environment and Natural Resources ("SEMARNAT") is empowered to request a technical opinion from a State or Municipal government when reviewing an environmental impact manifest. This is not mandatory, however, which means that SEMARNAT may or may not seek an opinion from the State or Municipal authority of the location where a project is to be developed. In practice, SEMARNAT does seek technical opinions from State and/or Municipal government on a regular basis. Thus, if a local authority issues a letter recommending to SEMARNAT that it deny an environmental impact authorization on the basis of land use or other environmental issues, SEMARNAT may likely take this into consideration and may agree with the local agency's recommendation.

³ Lic. Federico Ruanova-Guinea, attorney at law, Baker & McKenzie, provided these comments.

⁴ Please refer to Appendix B for a broader discussion of the regulatory framework.

Many people in Mexico believe that Municipal governments and not Federal regulators should be empowered to issue environmental impact authorizations for large projects such as power plants or gas storage and distribution facilities. Although this position certainly makes practical sense, it is also true that many Municipal governments lack the required human and financial resources to be able to run efficient environmental agencies.

Natural Gas Regulatory Framework.

Other concerns may arise as a result of what is perceived as lack of a regulatory framework in Mexico for certain activities involving natural gas. For example, there are no technical or environmental standards regulating the operation of liquefied natural gas reception terminals. Nevertheless, the production, storage, first hand sale and distribution of natural gas are regulated by the Natural Gas Regulations, in force since November 9th 1995.

Among the most important provisions of the Natural Gas Regulations, are the following:

1. Natural gas may be imported and exported freely; importers and exporters of natural gas are only required to provide the Energy Regulatory Commission (“CRE”) with reports regarding their foreign trade activities. Imported natural gas is not subject to price regulation.
2. CRE may promote the execution of coordination agreements with Federal and local authorities, in order to promote the development of natural gas related projects, particularly in the area of construction, operation and maintenance of production and distribution systems and with regard to the application of safety measures;
3. Natural gas storage activities require a permit from CRE. An extract of storage permit applications must be published by CRE in the Official Federal Gazette so that any interested party may issue comments or objections. In addition, and as explained in greater detail in the Annex to this article, during the procedure to secure an environmental impact authorization, SEMARNAT may organize public meetings so that citizens that may be affected by a natural gas storage installation may express their views and offer alternatives to reduce or minimize any environmental effects.

4. Natural gas permit holders are required to allow other permit holders to connect to their distribution pipelines if they have available capacity and if such interconnection is technically viable.

Cross-Border Air Quality Issues.

Another important topic for discussion is what will be the environmental effect on the Mexican and U.S side of the border once new power plants in Baja California begin operations. There is already some concern regarding the effects that power plant air emissions will have in the Mexicali and Imperial County areas.

Since the enactment of the Ecology Law in 1988, more than 30 standards have been enacted in the area of air quality. Among the most important is Official Mexican Standard NOM-085-ECOL-1993, which applies to fixed sources using fossil fuels. It establishes maximum allowable limits for emissions containing fumes, total suspended particles, sulfur dioxide and nitrogen oxide. In addition, the Ministry of Health has enacted a number of Standards dealing with ambient air quality.

The problem facing the border communities of California and Baja California is not lack of a regulatory framework. It is the disparity between the air quality standards applicable to California and the ones applicable to Mexico.

Since California's air quality standards are among the most stringent in the world, the argument goes, and since the Mexican power plants will be exporting electricity to California, it would only be fair for the Mexican power plants to comply with California air quality standards. The question is, can SEMARNAT force power plants to comply with "foreign" standards?

A simple response to this question would be "no". The Ecology Law states that one of the main purposes of Official Mexican Standards is the establishment of maximum allowable air emission limits to ensure the population's well being and the protection of the environment. Another important purpose is to provide long-term certainty to investors by creating clear rules in the area of environmental protection. Official Mexican Standards are valid and enforceable within Mexico.

A closer look at the Ecology Law, however, reveals that SEMARNAT, in the interest of preserving and protecting the environment, may induce companies to comply with voluntary standards that may be more stringent than the ones in force. This means that although companies are not legally required to comply above and beyond the law, in the interest of society and of becoming good environmental

citizens, they may enter into formal agreements with SEMARNAT whereby they agree to comply with standards that are more stringent than the ones in force in Mexico. These self-regulatory guidelines are also being incorporated into State and Municipal environmental laws.

Renewable Energy Issues

Current energy projects in Baja California rely for energy supplies on fossil fuels, such as oil products and natural gas that must be brought to the region. Even though burning natural gas is not as harmful to the environment as burning coal or diesel, pollutant air emissions are still generated.

In “Energy Issues in the San Diego/Tijuana Region,” a briefing paper for a previous Forum *Fronterizo* event, Alan R. Sweedler, of the Center for Energy Studies at San Diego State University, notes that Baja California has “an impressive array of renewable energy sources.” These include geothermal, micro hydroelectric, biomass, wind, solar and tidal. Unfortunately, these renewable sources of energy have been for the most part neglected in Mexico, because of relatively low costs for oil and natural gas and because renewable energy projects usually require high initial investments.

The Ecology Law nevertheless provides that the use of mechanisms, equipment and technologies that have as a purpose reducing or preventing environmental harm, as well as those that provide for an efficient use of natural resources and energy, should be given a priority when granting fiscal incentives. This means that investment costs in renewable energy projects may be partly offset by fiscal incentives that may be granted by Mexican tax authorities.

Fair Trade Practices.

Another issue of importance is in the area of fair trade practices and monopoly-prevention. Is the Mexican government going to allow only one company to import, store and export natural gas? Or can there be many companies providing such service on the Mexican side of the border?

Implicit answers to this question may be found in the Natural Gas Regulations, which state that natural gas may be freely imported or exported. This suggests that more than one company may carry out such activities. Also, the fact that the Regulations require natural gas storage permit holders to allow other permit holders to connect to their distribution pipelines if they have available capacity and

if interconnection is technically viable, may also be an indication that competition is encouraged.

Rights of Way.

An important aspect of constructing a gas distribution network deals with third party property rights. Natural gas pipelines may run through hundreds of private properties. In order for pipelines to legally pass through each property, an easement must be created. In Mexico there is no right of eminent domain. This means that it is up to the owner of the pipeline to negotiate with each property owner a fair price for allowing the pipeline to pass through his or her land.

Another alternative is for the Mexican government to expropriate a plot of land on the basis of “public utility”. The Mexican government is required by law to publish in the Official Federal Gazette an expropriation decree and may proceed to occupy or to limit the use of the property in question. The affected party has a right to contest the expropriation through an administrative appeal. Since this type of litigation may take months or years to resolve, it generally makes more sense to reach an agreement with a property owner or to relocate a pipeline in order to avoid construction delays.

Mexican Power Project Financings

Mexico will continue to be an important market for project finance lenders. Growth in demand has experts suggesting that installed capacity in Mexico will need to double over the next decade, with power project needs requiring some \$50 billion of new investment. Project finance remains the key tool for raising capital.

Power project financing in Mexico generally has been anchored in two kinds of financing: (1) multilateral development bank (MDB)-supported financing of projects with long term off take contracts with Comisión Federal de Electricidad (CFE), and (2) private sector financing of inside-the-fence projects with top-tier corporate off takers. Typically, both financing types use political risk cover provided by an export credit agency (ECA). A third kind of financing, driven by the power crisis in California, albeit with limited application, is likely to be private sector financing of generation facilities exporting power into the U.S. Each of the models, however, is based upon limited recourse financing of a single asset project supported by off take contracts with creditworthy entities.

The CFE-bid projects have been financed using MDB “A” and “B” loans, with the multilateral institution funding the A tranche and private sector banks funding the B tranche, and political risk insurance from an ECA wrapping the eligible portion

of the financing. In these financing, the bank group in the B tranche has not received any guarantee from the MDB, but its repayment risk is mitigated because the MDB remains the lender of record for the B tranche. The projects are supported by build-own-operate long-term power purchaser agreements from CFE and long-term fuel supply contracts from Petróleos Mexicanos (PEMEX). The Merida III project was financed using this model in mid-1998, and the Rio Bravo, Saltillo and Hermosillo projects followed.

Inside-the-fence projects have taken advantage of the strong credit quality of a number of Mexican corporations, many of which would enjoy an investment grade credit rating, once Standard and Poors upgrades Mexico's rating. (Moody's already has listed Mexico as investment grade.) Although MDB financing has been applied to these projects if there is a CFE-purchase component, typically private sector financing has been used. Projects financed using this model are Termoelectrica del Golfo, with CEMEX as the off taker, Termoelectrica Penoles, with Penoles as the off taker, and Enron Monterrey, with Grupo Vitro, Imsa and Apasco as the off takers. Interestingly, InterGen's Bajio Project in Guanajuato is a mixture of both models, with 80% of the output under contract to CFE and the remainder sold to local industrial customers under short-term contracts.

Mexican projects destined to supply the California market likely will use private sector funding based upon a long-term off take contract with a creditworthy U.S. power marketer. Since MDB's like the International Finance Corporation and the Inter-American Development Bank have almost reached their limits of exposure to Mexico, and with the potential for Mexico to be upgraded to investment grade, it is less likely that MDB will be interested in financing infrastructure development that does not support Mexico's power needs. More likely, ECA's along with private insurers providing political risk coverage will step in to support private sector funding.

As the Mexican power market develops, and the outlook for Mexico's debt rating remains positive, it is likely that more attractive financing alternatives may be available to project sponsors. Increasingly, U.S. sponsors are accessing the bond market for capital on terms that are more flexible than traditionally imposed by indenture covenants. In addition, credit support has allowed a portion of highly rated U.S. energy deals to fund through a commercial paper program. Both vehicles, under the right circumstances, may eventually be available for Mexican power projects.

In the U.S., sponsors are seeking to move to portfolio financing of several assets for which cross-asset trading and marketing strategies can support limited recourse financing without long-term off take contracts. The constraints currently imposed

by the Mexican power market and the gas monopoly enjoyed by PEMEX, however, make it difficult to use such project finance strategies for Mexican projects. Nevertheless, the current Administration seems to be sending the right signals that would allow development of independent power projects selling into competitive markets.

APPENDIX A

MAJOR ENERGY PROJECTS UNDER WAY IN BAJA CALIFORNIA

Currently there are major energy projects under way in Baja California that will help resolve the short, medium and long-term energy needs of California and Baja California.

1. InterGen is building a 750 megawatt combined cycle thermoelectric plant in Mexicali that will export 200 megawatts to California and will sell 550 to Comisión Federal de Electricidad (“CFE”).
2. Sempra Energy is building a 650 megawatt combined cycle thermoelectric plant in Mexicali that will be exporting all of its production to California
3. AES will also be building a 500 megawatt combined cycle thermoelectric plant in Rosarito that will be exporting all or part of its production to California.
4. Gasoducto Baja Norte, a Sempra Energy/Proxima venture, is also in the process of building a natural gas pipeline with a capacity of 500 million cubic feet per day from Algodones to Tijuana via Mexicali and Tecate.

APPENDIX B

ENVIRONMENTAL REQUIREMENTS THAT POWER PLANTS AND NATURAL GAS DISTRIBUTORS MUST MEET UNDER MEXICAN LAW

1. General Overview

Mexico has experienced significant changes in the area of environmental protection during the last decade. A considerable number of environmental regulations have been enacted at the federal and state levels.

This environmental framework currently imposes a number of permitting and compliance requirements to private companies that intend to construct and operate power plants, either to sell power to the Federal Electricity Commission (Comisión Federal de Electricidad or “CFE”), to produce power for private companies or to export electricity. This is also the case in the area of gas production and distribution.

This paper provides an overview of the Mexican environmental law system, its regulatory agencies and, more importantly, of the environmental permitting and compliance requirements that power plants must meet.

2. The Legal Framework

Constitutional Provisions/Federal, State and Municipal Laws

The Mexican Constitution provides that every person has a right to enjoy an adequate environment for his or her development and well being, proclaiming the inalienable right that all people have to live in a healthy environment. It is up to federal and state laws to define how to achieve this goal.

The Constitution also provides that the federal government must adopt the necessary measures designed to regulate land use, and to preserve and protect the ecological balance, and mandates Congress to legislate in the area of environmental protection and the preservation of the ecological balance. Mexico’s most important environmental law is the General Law of Ecological Balance and Environmental Protection (the “General Law”) enacted in 1988, and amended on December 13, 1996. The General Law establishes national environmental policy, defines jurisdictional distribution, and regulates a number of topics, such as environmental impact permitting, natural resource protection, prevention and control of soil, water and air pollution, high-risk industrial activity regulation, hazardous waste management, community right to know and environmental liability.

In addition, Federal Regulations are currently in force in the following areas:

- a) Environmental Impact Evaluation;
- b) Prevention and Control of Air Pollution;
- c) Water Quality;
- d) Hazardous Waste;
- e) Natural Protected Land.

At the state level, most of Mexico's 31 states and the Federal District (Mexico City) have enacted their own environmental laws. These laws regulate matters that do not fall under the jurisdiction of the federal government, such as the supervision and control of air emission sources under state or municipal jurisdiction, control of wastewater discharges into municipal or urban sewer systems, solid waste handling and disposal, etc.

Jurisdictional Distribution

Article 124 of the Mexican Constitution provides that those matters not expressly falling under the jurisdiction of the federal government are regulated by the states. The General Law expressly defines which areas are subject to federal jurisdiction, and in the case of construction and operation of power plants and oil and gas pipelines these activities are federally regulated.

Integration Initiatives

During the North American Free Trade Agreement ("NAFTA") negotiations, a number of non-governmental organizations ("NGO's") from Canada, Mexico and the United States began pressuring the NAFTA partners to create an agreement dealing with environmental protection, particularly in the area domestic law enforcement. As a result of such pressure, the North American Agreement of Environmental Cooperation ("NAEC") was signed.

The principal objectives of NAEC are the conservation, protection and improvement of the environment within the territory of each of the three NAFTA countries, the support of environmental goals and objectives of the Free Trade Agreement, the promotion of sustainable development and the improvement of domestic environmental laws. Under NAEC, each NAFTA country must ensure that its environmental laws and regulations are properly enforced. This is probably the most important provision of NAEC, and the one that prompted the pressure from NGOs to have this Agreement signed, since it was believed that Mexico was not doing enough to enforce its environmental laws.

It is important to note that NAEC does not empower any of the environmental agencies of the three NAFTA partners to enforce compliance of the environmental laws of another party. However, if a NAFTA partner fails to enforce its domestic environmental laws, it may be subject to the dispute mechanism created within the NAEC, which may lead to monetary enforcement and in some cases the suspension of NAFTA benefits

3. The Regulators

Mexico's main environmental regulator is the Ministry of Environment and Natural Resources (*Secretaría de Medio Ambiente y Recursos Naturales* or "SEMARNAT"). This cabinet agency is entrusted with overseeing federal environmental policy and enforcing federal environmental

laws. In order to better develop and enforce environmental law and policy, SEMARNAT has created the following decentralized environmental agencies:

- a) The National Ecology Institute (*Instituto Nacional de Ecología* or “INE”). Among INE’s attributions are the development of environmental policy and the publication and enactment of environmental regulations and official standards;
- b) The National Water Commission (*Comisión Nacional del Agua* or “CNA”). CNA is the federal authority in charge of issuing national water use concessions and permits, setting national water quality policy and of regulating wastewater discharges into national lands or waters such as rivers, lakes, marine waters or into man-made water deposits such as dams and reservoirs, and
- c) The Federal Bureau of Environmental Protection (*Procuraduría Federal de Protección al Ambiente* or “PROFEPA”) which is Mexico’s federal environmental enforcement agency.

4. Power Generation and Natural Gas Distribution Permitting and Compliance Requirements

Land Use Requirements

The General Law requires state and municipal authorities to develop ecological ordainment plans in order to, among other things, regulate land uses for the purpose of protecting the environment and the population. State or municipal authorities on the basis of local urban development regulations generally decide the determination of whether or not a given area is suitable for industrial activities. Zoning or use of land authorizations (*autorizaciones de uso de suelo*) may vary from those that allow light industrial activities to those that authorize heavy or high-risk activities. In recent years, a number of urban development plans have been enacted by cities located along the Mexico-U.S border for the purpose of regulating land use and setting aside areas suitable for industrial activities.

The General Law provides that buffer zones should be created around establishments that carry out high-risk activities; within such buffer zones no housing or commercial developments should be allowed. Partly as a result of an accident at a Mexico City oil and gas installation that left hundreds dead and injured in 1985, the Mexican government decided to regulate “high-risk” activities, and as a result, developed two accords on the subject. The purpose of these accords was to help State and Municipal authorities regulate land uses around such high-risk activities. The first accord came into effect on March 29, 1990, and the second on May 5, 1992. The accords contain listings that establish threshold limits on the use of a number of toxic, flammable and explosive substances; for example, the use, production, storage or processing at any given time of 500 kilograms or more of natural or any gas (i.e. propane, butane) is considered a high-risk activity and, consequently, specific measures must be adopted to reduce or minimize the risk associated with the use of natural or any gas (i.e. propane, butane), such as the establishment of a buffer zone around the area where the gas is being stored. More importantly, a land use permit expressly allowing high-risk activities to be carried out must be secured from the Municipal authority prior to constructing or operating a high-risk installation, aside from securing an Environmental Impact Authorization, as discussed below.

In recent years many companies have approached SEMARNAT with the intent of getting the threshold limits for the use of gas increased, since the 500-kilogram threshold limit is a very low. SEMARNAT is in the process of developing new high-risk guidelines that will likely introduce a new ceiling limit for the use of natural or any gas (i.e. propane, butane) and other flammable and explosive substances.

Environmental Impact Permitting

The General Law expressly states that the power industry and gas distribution is subject to federal jurisdiction in the area of environmental impact as well as in the area of air emissions. This means that prior to constructing and operating a power plant or a natural gas storage and distribution facility, an Environmental Impact Authorization (“EIA”) must be secured from SEMARNAT. To secure an EIA, an Environmental Impact Manifest must be submitted. Such manifest must be accompanied by a risk study if the activity qualifies as high-risk.

Types of Environmental Impact Manifests

There are two types of Environmental Impact Manifests: Regional and Particular. The type of applicable Manifest is determined on the basis of the size and importance of the work or activity and particularly on the degree of impact to the environment. Since power plants are sizeable projects that may have significant environmental implications in the area of air emissions, water use and waste generation, SEMARNAT generally requires that a Regional Manifest be submitted.

Public Review Process

Until recently, public participation in the environmental impact permitting process was very limited. However, the General Law now allows citizens affected by a work or activity being evaluated to have a say on how the adverse effects derived from such work or activity may be mitigated.

As a general rule, once SEMARNAT has received an Environmental Impact Manifest and has begun the evaluation process, it must make it available to the public so that any third party may review the corresponding file. Applicants may request certain information provided to SEMARNAT be kept confidential if they deem that industrial or proprietary information may be jeopardized.

Any person that may be affected by a project under review has the right to review an extract of the Environmental Impact Manifest and request a public meeting. The public review process is subject to the following rules:

1. SEMARNAT must publish the Environmental Impact Manifest in its Ecological Gazette. In addition, the applicant must publish at its cost an extract of the project or activity in a newspaper of broad circulation in the state in which the activity is to be carried out, within a term of 5 business days from the date in which the Manifest has been filed;

2. any citizen, within a term of 10 business days from the date in which the extract is published, may request that SEMARNAT make the Environmental Impact Manifest available to the public;
3. if the activity being evaluated may cause serious ecological imbalances or health problems, SEMARNAT, in coordination with local authorities, may organize a public meeting in which the applicant will be required to explain the technical aspects of the project;
4. any interested party within a term of 20 business days from the date in which SEMARNAT makes the Environmental Impact Manifest available to the public, may propose the establishment of additional control and mitigating measures and make any other pertinent observations;
5. SEMARNAT must include the observations made by interested parties in the corresponding file and must make reference in the resulting resolution to the public review process and the observations received from interested parties.

Environmental Impact Rulings

Once an Environmental Impact Manifest has been evaluated, SEMARNAT must issue a resolution that may:

1. Authorize the work or activity to move forward in the terms of the Environmental Impact Manifest;
2. Authorize the work or activity subject to certain changes or to the establishment of additional preventive and mitigating measures. SEMARNAT may also order that any of the control and mitigating measures proposed by members of the affected community be implemented by the applicant;
3. Deny the authorization, if:
 - a) The provisions of the General Law and its regulations are not complied with;
 - b) The work or activity may cause one or more species to be declared threatened or in danger of extinction or when one of such species is affected, or
 - d) It is proven that the Environmental Impact Manifest contained false or misleading information.

In the case of an EIA for the construction and operation of a power plant, SEMARNAT may require the authorized party to comply with a number of mitigating and control measures such as:

1. The development of a flora and fauna rescue plan around the project site;
2. Securing the required local permits for site clearing activities;
3. Securing letters from different Federal, State and Municipal regulators stating the project is compatible with local zoning ordinances and that the same will not affect other projects;

4. Carrying out a reforestation program;

Air Emissions Licensing and Compliance Requirements

Power plants are considered federal fixed emission sources. As a result, they are regulated by SEMARNAT and must secure a Consolidated License, generally within 3 months from the date in which they begin operations. It takes SEMARNAT between 30 to 60 business days to review a License application. Once a License has been issued, it requires that the same be updated on a yearly basis.

In addition to securing a License, power plants are required to:

1. Install air emission monitoring stations and conduct periodic monitoring;
2. prepare air emission inventories;
3. install air emission sampling platforms or ports;
4. install air pollution control equipment;

Air Emission Standards

Solid particle emissions are regulated by Official Mexican Standard NOM-043-ECOL-1993 (“NOM-043”), in force since October 23, 1993. In the case of fixed sources that use solid, liquid or gas fossil fuels (or a combination thereof), NOM-085-ECOL-1994 (“NOM-085”) establishes the maximum allowable levels of emissions containing fumes, total suspended particles, sulfur dioxide and nitrogen oxide, as well as the maximum allowable levels of sulfur dioxide emissions generated by direct combustion heating equipment.

Following are the maximum allowable solid particle emissions limits applicable to the border areas, according to NOM-043:

Gas flow (m³/minute)	mg/m³
5	1536
10	1148
20	858
40	724
60	641
100	437
200	326
500	222
1000	166
5000	84
10000	63
30000	40
50000	32

The maximum allowable levels of emissions containing fumes, total suspended particles, sulfur dioxide and nitrogen oxide in the border areas are currently the following, according to NOM-085:

Combustion Equipment Capacity MJ/h	Type of fuel used	Fume density Opacity number	Particles (PST) mg/m ³ (kg/10 ⁶ cal)	Sulfur Dioxide ppm V (kg/10 ⁶ cal)	Nitrogen Oxide ppm V (kg/10 ⁶ cal)	Excess Combustion Air % volume
up to 5,250	gas fuel	3	N.A.	1,100 (4.08)	N.A.	50
	other liquids	3	N.A.	2,600 (9.81)	N.A.	
	gas	0	N.A.	N.A.	N.A.	
5,250 to 43,000	liquid	N.A.	350 (0.497)	1,100 (4.08)	190 (0.507)	40
	gas	N.A.	N.A.	N.A.	190 (0.507)	
43,000 to 110,000	liquid	N.A.	300 (0.426)	1,100 (4.08)	110 (0.294)	30
	gas	N.A.	N.A.	N.A.	400 (1.023)	
> 110,000	solid	N.A.	250 (0.375)	1,100 (4.31)	110 (0.309)	25
	liquid	N.A.	250 (0.375)	1,100 (4.31)	110 (0.309)	
	gas	N.A.	N.A.	N.A.	110 (0.281)	

In the area of ambient air quality, the Ministry of Health has published Standards regulating ozone, carbon monoxide, sulfur dioxide, nitrogen dioxide, lead and solid particulate. These Standards set the criteria to evaluate each of these compounds and establish recommended levels for each from a public health standpoint.

###



2001 Forum *Fronterizo* Series

Underwriters

**Sempra Energy
The San Diego Union-Tribune
Public Policy Institute of California**

Sponsors

**Concert
Baker & McKenzie
First National Bank
International Gateway of the Americas**

Co-Sponsors

**SAIC
Kyocera America, Inc.
Samsung International
San Diego Padres Baseball Club
San Diego Unified Port District
Teléfonos del Noroeste (TELNOR)
The Corky McMillin Companies**

Contributors

Bustamante, Escandón y Pareyón S.C. ♦ Colliers International ♦ Consejo de Desarrollo Económico de Tijuana, A.C. ♦ EarthTech ♦ Frontera ♦ Grupo Afal ♦ Luce, Forward, Hamilton & Scripps, LLP
Maricultura del Norte ♦ Mexico Business Consulting. ♦ Proxima Gas, S.A. de C.V.
RPM Material Handling Co. ♦ Sanford R. Goodkin & Associates ♦ Seltzer Caplan McMahon Vitek
Sentre Partners

