

## US-Mexico Cross Border Energy Trade Workshop

San Antonio, Texas

November 18-19, 2002

Westin La Cantera Resort

### Proceedings

## Summary of Remarks and Discussions

**Monday, November 18**

9:15 – 9:25 AM

### **Workshop Overview**

**Ahmad Ghamarian, PhD, IIE Energy Group**

The underlying assumption of the workshop is that the interconnection and integration of energy sector brings benefit to the consumer in the form of lower electricity and gas prices, and also in the form of security and reliability at national level in gas and electricity. U.S. and Mexico have, or will soon have, demand for additional electric capacity and natural gas supply. Through these discussions, key players can develop strategies for resource and infrastructure development to share and deliver these services and resources between the two countries.

9:25 – 10:10 AM

### **Discussion: U.S. - Mexico Energy Interconnection Vision**

**Vicky Bailey, Assistant Secretary for International Affairs, USDOE**

Assistant Secretary Bailey's remarks expressed the US-Mexico energy vision from the US perspective. This meeting represents a convergence of two top priorities for the Bush Administration --- enhanced cooperation with our neighbors in Mexico and our strong commitment to ensuring a secure and reliable supply of energy for our citizens. Both countries face growing demand for electricity and natural gas that will require significant investment in energy resources and infrastructure.

Increased energy exchange between the U.S. and Mexico will help promote a secure supply of energy by allowing the two countries to diversify energy sources and enhance the reliability of their energy systems. The challenge is moving away from a country perspective with borders to a broader vision, which transcends boundaries. This collective approach can be extremely useful as the U.S. and Mexico address individual energy sector requirements and implement long-term economic strategies. The purpose of these border-specific discussions is to build the steps to a North American energy market.

In order to achieve this, governments and companies need to work together to create an environment that facilitates more interconnection and increased energy trade. Policy makers, regulators, industry representatives, local authorities and federal officials all play an important role in developing and delivering energy supplies in the border region, and are all part of the solution to meeting our growing energy demand. The first main challenge is public perception. Increased energy integration is not a threat to national sovereignty. While our economic structures may vary, we need to identify and foster the market conditions necessary for additional trade and infrastructure development. We need to provide the market incentives and safeguards to enable increased energy trade and economic growth. In addition, regulations and policies need to be structured with bilateral interaction in mind. Regulations do not need to be the same; however, they need to be transparent and compatible in order to support the most efficient functioning of energy systems.

By the end of this workshop, participants will have developed an initial list of technical, market and regulatory obstacles and opportunities to expand cross border energy trade, that will help us carry forward our initial dialogue and to develop tangible follow-up measures. *(prepared remarks attached)*

**Francisco Barnés, Undersecretary of Energy Policy and Technology Development, SENER**

Undersecretary Barnes addressed the workshop expressing a set of key issues to address during the discussions, and Mexico's long-term vision of energy interconnection and trade. Key issues include: the necessity of a joint long-term vision in energy policy to develop the border region to its full potential; the need for a reliable supply of energy and robust infrastructure to ensure the full development of investment opportunities in the border region requires; and the priority and interest in developing robust energy

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corridors to further enable the benefits trade opportunities to be realized, help secure supply and optimize reserve capacity in both sides of the border.

It is in both countries' interest to develop a shared vision of the cross-border interconnections for natural gas and electric power that would be required in order to: Develop an interconnected regional market that will offer increased reliability and security for both countries; and allow the different actors to take full advantage of the possibilities for energy trade and for back-up capacity.

If the two countries cannot look beyond the short-term obstacles, it will be very difficult to break the competitive cycle that has hindered the development of strong interconnections. The U.S. and Mexico should work together to identify the set of cross-border corridors with robust interconnections that both countries would like to see being developed. The two governments, within their legal frameworks, should further facilitate the process of obtaining permits and licenses required for cross-border interconnections. In the short term, we need to work together to identify business opportunities and to develop a common strategy to overcome existing obstacles caused by differing legal and commercial frameworks. At the same time, both countries should develop a long term strategic vision, and identify those vital interconnections that both countries would like to put into place in order to improve supply reliability and to enhance energy trade. (*presentation attached*)

**Charles Matthews**, *Commissioner, Texas Railroad Commission*

Texas has a long history with Mexico, a relationship that was formalized in 1978 when then governor of Texas recognized importance of trade with Mexico by establishing a trade office in Mexico City.

Since 1997 the Texas Railroad Commission (RRC) has provided technical direction and advice to the CRE. In January 2000, the two organizations began discussions between CRE and the Texas RRC on streamlining border energy projects. In Aug 2000, an RRC delegation made a 2-day visit to Mexico and the CRE with the goal of increasing the understanding of the bilateral connection. Over ten years, Texas has averaged 5.5 trillion cu ft/yr production of gas, less than 30% of US of which (1.7 tcf) was sold to the Midwest and Northeast U.S. Competing with Canadian gas production, (3000 bcf in 2001), Texas seeks new markets, and is looking to south to Mexico. Storage of gas in Texas is now at a 5 year high. At same prices, and with lower transport costs, selling south to Mexico and others will lower overall cost and raise revenues in the Texas gas industry. Discussions with CRE in August 2002 highlighted the problems that remain on US side, primarily in the permitting process, which has been significantly streamlined in Mexico but not US. New gas projects in Texas require the approval of 10 regulators: 4 in Texas and 6 on the federal level. A recent Memorandum of Understanding (MOU) between Texas State agencies has since been put in place to streamline process. (This manual is available on RRC website.) On state level, as pipeline developers comes to RRC, permit applicants need only deal with the RRC, which then liaises with other agencies in the process. Tidelands Oil and Gas Company underwent the first test of the new system, and with the assistance of FERC and Pat Woods, received all approvals and the permit in just 14 months. Up to this point, the timeline for permitting had averaged 3 years. As an added benefit, CRE molded their pipeline standards to USDOT specifications, providing floor for negotiations. The RRC relationship with CRE has been consistently positive and productive with an open exchange of communication and ideas. RRC envisions that in 15 years, borders will be transparent with free exchange of gas and electricity. Regulators on both sides are interested in seeing that occur and see no obstacles otherwise.

10:30 AM – 1:00 PM

### ***Current Situation and Identification of Obstacles to the Development of Power Interconnections***

*Moderator, Alberto Escofet, President, Alesco Consultores*

### **Current Energy Situation in the Texas-Mexico Border Region**

**Florencio Aboytes García, PhD**, *Manager of Electric Systems, Federal Electricity Commission (CFE)*

Key points: The key to developing Mexico's power sector is the transfer of electricity from the northeast to the central regions of the country. Given that the Mexican system is stronger than that on the U.S. side along the Texas/ERCOT border, the CFE-ERCOT interconnection needs greater analysis and development

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to determine how Mexico can access the power generated in central Texas and the WSCC. CFE's view considers thru-access paramount to the creation of a strong, reliable bulk power system across the border. (*presentation attached*)

#### **Technical Issues**

*William Boroquez, Director for Transport Services, ERCOT*

Key points: Interconnection options along the border take the form of block loading (switchable generation), DC converter ties and AC connections. The higher cost and complexity of AC connections makes DC converter ties a more attractive option. ERCOT concurs with CFE in the best potential locations of the HVDC ties along the Texas-Mexico border. (*presentation attached*)

#### **Market Structure**

*Les Barrow, Director of ERCOT and System Performance, San Antonio Utility*

Key points: Essential concepts of the ERCOT market structure are that all systems flow, and ERCOT manages congestion by rescheduling flows; generators are not obligated to pay for access if not flowing; and congestion charges are expensed to the QSE (the third party scheduler). The Base Energy Schedule constitutes 90-95% of the market, in which flows are bilateral. (*presentation attached*)

#### **Policy and Regulatory Impacts**

*Dionisio Perez-Jácome, President, Energy Regulatory Commission (CRE)*

Key points: U.S. and Mexico operate under differing market structures, where Mexico continues to rely on two vertically integrated power companies (CFE and LFE). CRE is currently limited to regulating private sector generation activity (not CFE or LFE), and does not regulate transmission and distribution activities. Main obstacles to interconnection lie in transmission (need integrated planning system that considers rights of way and environmental concerns) and regulation (need system access and technical compatibility, a system operator separate from CFE, and a regulatory accounting system). (*presentation attached*)

*Brett Perlman, Chairman, Public Utility Commission of Texas*

Key points: Since 1995, the role of the regulator in Texas has evolved to a point of restructuring and opening the market to competition, overseeing certification and the overall healthy functioning of the power system. Unlike other agencies in states, the PUCT has jurisdiction over both wholesale and retail distribution. There is open access to the transmission system, no rate regulation on retail side and unbundled utilities. Opportunities for interconnection are significant, and much investment in transmission is needed to fully exploit the recent growth in generation, particularly in the valley area. Issues to be addressed include: developing an integrated vision and plan, talking more about transmission corridors, increasing bilateral understanding of commercial rules, better understanding of the opportunities to sell power into Mexico. The PCUT worked on cross border connection with CFE, in creating a report in 2000 that identified the opportunity to build 600 MW of asynchronous (DC) ties, at three points on the border, at the Brownsville, McAllen and Laredo sites previously discussed. ERCOT and CFE would be equally responsible for construction. In Texas the costs would be handled through into current rate structure. Clearly, good work has been done to plan for increased transmission capacity along the border; what remains is to start acting on these proposed projects.

#### **Discussion and Comments:**

The 1970s brought electric power ties and exchange to the Northeast region of Mexico. Infrastructure has continued to develop along the border region for the purpose of channeling power to the central regions of the country where the population and industrial production is concentrated. Our purpose in these discussions is to identify the constraints to investment and cross-border power exchange, and strategies by which these constraints can be overcome. The comparison of AC and DC solutions is further impetus for addressing the technical issues in balance with economic considerations when analyzing complete interconnection scenarios.

Interconnection allows U.S. and Mexican utilities to sell power on bilateral wholesale markets. Currently, there is power exchange at the Texas-Sonora border where Mexico imports 500-600 MW annually. There

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are additional ties along the Arizona and New Mexico borders that are under consideration. CFE has received several proposals from U.S. and international firms for the creation of these and other connections. The decisions regarding these proposals will be made after some additional technical analysis of the locations and their capacities.

There is currently a generating capacity of 1200 MW along the border. For purposes of planning, there remains a need to simulate interconnection at various points to focus on which locations are most in need of power exchange. DC ties are an elegant solution to interconnection, and there is great interest and willingness to finance these projects. Private industry lacks the understanding of the need and potential results/benefits that would justify the investment in additional transmission. There is uncertainty overall is how to mitigate the risk of investment, and who should bear the burden of this risk.

**In order to address some of these issues, there is interest in creating an ERCOT-CFE partnership to better synchronize transmission planning and technical compatibility.** On the U.S.-side, it is up to the market participants to drive the process of interconnection. There are no regulatory barriers within the current market structure. In Mexico, private projects are in place and operating in the restricted market. CRE has proposed changes to ease some of the current market restrictions (ex. purchasing least-cost power on long term purchase agreements) and provide greater grid access to private enterprise. One opportunity to capture cross border exchange is in providing reserve capacity on both sides. Over the long term, policy makers need to identify advantages of exchange during daily peaks and annual cycles.

2:30 – 3:20 PM

### Strategies to Address Opportunities in the Power Sector

#### **Bidding Process**

*Fernando Gireud, Vice President, International Business, El Paso Electric*

Lessons learned: U.S. industry-case study of bid proposal process

Key points: CFE authorities have real expertise in the Mexican energy sector, a clear understanding of pricing and contracts, and they are prepared to discuss the details with any prospective investor. The business environment however, is difficult to work within. The bidding process in Mexico is currently complicated and cumbersome. It is essential to understand the culture, infrastructure, and market, to know the people that you're doing business with and their needs in great detail. It is equally important to have legal counsel when preparing a bid package to ensure that all required documents are correctly submitted. A successful project will help to connect Mexico with some of the largest power networks in the U.S. These interconnections then become no longer just business deals, but essential projects to ensure the reliability and security of Mexican electricity service.

#### **Mexican perspective on case study and bid process**

*Alberto Ramos, Deputy Director of Project Development and Financial Investment, Federal Electricity Commission (CFE)*

Key points: The bid process in Mexico consists of the following steps: (1) Public Bid; (2) Site Visit; (3) Two Clarification Meetings for Questions and Comments from the Bidders; (4) Final Bid Documents; (5) Two Stage Evaluation Process: Technical and Economic; (6) Contract Award to the Lowest Levelized Unit Price Per kWh. According to the 1992 reforms, and under the outlines of Independent Power Producer and Financed Public Work, 27-generation projects have been bid, and there are in additional process 12 projects, and 8 of them are located in northern Mexico. New infrastructure for natural gas transportation is needed however, to satisfy the fuel demand for these northern generation projects. CFE plans to continue to develop generation, transmission, transformation and distribution projects, under the IPP, OPF and Own Resources schemes to satisfy consumer demand in the energy public service system. (*presentation attached*)

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#### Update on U.S. Regulatory Efforts

*Shelton Cannon, Deputy Director of Markets, Tariffs and Rates, FERC*

Key Points: FERC has limited justification on power siting for generation and transmission. Their authority is to set rates. FERC's vision, which has been asserted for over 10 years, is to see a competitive wholesale market in all of North America. To fulfill this vision, it is essential to build/maintain infrastructure, establish workable ground rules and enforce those rules. FERC's new 600+ page document/ruling on Independent Transmission Providers outlines the essential elements of the market design, including transmission tariffs, pricing reform, day-ahead and spot market rules, resource adequacy, regional planning, and mitigating and managing market power. Using the Canadian relationship as an example, trade works well when the market rules are right and both sides look toward greater integration and eliminating seams. The challenges to the U.S.-Mexico relationship lie in (1) Restoring confidence to the market, and determining whether a competitive market makes sense; (2) Retaining long term vision while focusing on short term efficiencies; and (3) Solidifying a more effective state and federal partnership.

*Tony Como, Office of Fossil Energy, USDOE*

Key points: USDOE regulates electricity exports and issues Presidential permits across the border – activities which impact the reliability and security of the power system. Applicant timing and coordination in the process are key to minimizing an otherwise slow process. The intricacy of required Environmental Impact Statements often further delays the process. Perhaps if USDOE were to undertake an environmental review of theoretical transmission pass sites, much of the information required through the permitting process would already be available to the regulators. It is thought in some ways that transmission has an inherent value, and that risk is minimal, as generators and distributors will take advantage of existing infrastructure to further expand their markets.

#### Infrastructure Development

*Alejandro Cuevas, Director of Electricity Investment Promotion Office, SENER*

Key points: New transmission infrastructure, and heavy involvement of the private sector, is necessary for business development along the U.S.-Mexico border. In the new sites for transmission identified by SENER, the consumers are industrial businesses. Industrial users are an alternative buyer of imported power - who, instead of CFE, would use the new transmission lines while the market is further expanded. These industrial users would obtain the import permit and, based on the CFE-established rates, decide whether to sell excess power domestically or re-export. SENER investment unit issues the details and rules of establishing these sites. (*presentation attached*)

3:40 – 5:00 PM

#### Discussion and Comments

There is a strong consensus that increased U.S.-Mexico interconnection is a positive development. NAFTA has facilitated the bidding process, and in 2001, brought forth projects valuing US\$232 billion. For those knowing the technical aspects of how interconnections work, the key questions are: Why hasn't more been done, and what can we do to make it happen? Perhaps by conducting joint studies or combining planning efforts, but how do we make CRE, FERC, ERCOT, and others work similarly? At least ERCOT and CRE have used the same methodology in evaluating three recent, potential interconnections. There also remains a financing hurdle, as few are willing to undertake the risk of building new infrastructure in a seemingly uncertain market. Who will then have ownership of the capital? Can we find a method for reduced cost planning? These are all issues that remain to be fully addressed.

From the Mexican perspective, there is additional need to follow through on CRE's and CFE's strategic visions. The strategy for increased collaboration should be to keep the USDOE and SENER visions aligned. However, such alignment is difficult when there are conflicts to a shared vision within the agencies. In terms of financial considerations, key elements are a U.S. policy statement underscoring the interconnection priority, and the increase in NADBank's role vis-à-vis a board resolution.

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To many observers, new transmission line construction inevitably results in increased emissions. Increased emissions may be avoided however, if there is a modernization or rationalization in the market. In which case, NADBank may be able to more seriously consider supporting a transmission project. In the U.S. the cost of environmental compliance, by meeting control requirements or obtaining offsets, is found in the cost building new power plants. Integrating commercial U.S. and Mexican power markets may also mean sharing the environmental costs that U.S. companies bear with their Mexican partners. The question arises: Can the commercial cost of mitigating pollution be rationalized across the border? During internal EPA deliberations on border activity for next 10 years, a goal was suggested of meeting the requirements for growth without comprising environmental quality. Because the values of energy demand and the pollution that results from meeting this demand are not yet quantifiable to EPA, the agency could not commit to this goal. If the U.S. EPA is unable to project an increase in air quality and reduction in emissions, while the power sector to increases production and service, it is unlikely that NADBank can resolve the conflict between environmental sacrifice and energy development in order to fund transmission infrastructure.

CFE is convinced of the benefits of having such strategic assets, that even at a zero power flow, connections offer system support. Short and long term transactions can serve to lower the reserve margins. These flows require the construction and use of transmission corridors. The development of these corridors needs private funds, but with recent deregulation, we see low investment in transmission. While Mexico wants to see the increased opportunities of a market, it needs the transmission system. ERCOT agrees with the bulk of CFE's perspective, but insists on private transmission sponsors. There is little to no interest shown by the companies capable of such investment. It may be possible for federal agencies to work together to reduce the real or perceived risk of investment to these developers. Could merchant power work as a solution to the lack of investment otherwise?

Given the two governments' concurrence on the priority of interconnection, we now need the involvement of developers, utilities and service providers in the process. As stated in Vicky Bailey's opening comments, the energy and commerce are connected, yet the trade benefits of NAFTA have not yet reached the energy sector. There needs to be a driver behind increased interconnection and energy exchange. The most likely of incentives will come from projects' financial feasibility.

Using the approach that we build the market to ensure that transmission gets built in the most efficient manner can eliminate the circular argument rising out of the role of the market in the construction of new infrastructure. Solutions present themselves once the infrastructure is in place to provide sustainability to the project (as in the case of the gas industry where companies use declining pipelines for additional uses). Yet, unless it is clearly established how a line will gain revenue, private firms maintain that the cost of transmission construction keeps it from being built – even those projects which have overcome other political and economic obstacles. A solution to this problem may be to create a trust, or autonomous entity with ties to utilities and ISOs, which is overseen by the regulatory agency. The first transactions of this trust would be highly regulated and monitored. Potential contributors to this financing alternative are ready to put this structure in place, where all stakeholders would be engaged and be able to protect their interests in the project(s).

Three scenarios are presented with the strongest potential to raise Mexican power imports from the U.S.:

- Those driven by private demand, or “self-supply projects”. The law in Mexico today allows permits for self-supply, with some restrictions. This mechanism is not as open as simply importing the power into Mexico and selling it to any available consumer, but rather the exact consumer must be stated clearly in the permit application. Given that there is not a true market in Mexico, long-term power purchase agreements are the most valuable element to this type of project.
- Those driven by CFE demand. IPPs exist in Mexico but not very flexible. Although CFE has taken huge steps in opening the request for proposals process, the way in which IPPs could still be changed for the better. Instead of defining the technology and the site, CFE should establish different interconnection points through which imports may participate in IPPs. Increased opportunity to participate in the Mexican market through the IPPs could become a driver of further

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interconnections. It would require a CFE guarantee of payment for other private sources to participate in these IPPs, which is not possible today.

- Lines built by CFE itself, who then buys electricity, for instance, to meet a strategic objective to diversify sources of electricity or obtain electricity in an emergency situation. These projects still need to be financially feasible for Mexican authorities to authorize the project.

Faced with a limited market in Mexico for power imports, it may be easier to build projects to export power to the U.S. where the market is open. Merchant plants are a strong potential to service export lines to the U.S., where power can be sold through bilateral agreements, spot markets or other mechanisms. From the Mexican perspective, export projects only require good coordination between regulatory agencies to facilitate the environmental and technical constraints, and otherwise do not face any clear obstacle for their development.

Private stakeholders feel some liability attached to their speaking out on obstacles to trade and interconnection, the consequence of which may be to offend a potential client. While CFE's function is distinctly different from ERCOT, its parallel organization in the U.S, its interest is mainly to protect service for Mexican suppliers. Its regulatory functions are not focused on numbers and prices.

In addition to transparency and commercial concerns, communication may be a stumbling block in the process. Engaging in this discussion in terms of electricity reliability and quantifying the benefit may overcome some language issues that have clouded the solutions. Can we change the debate from a purely economical one to that of economics and system reliability? It is likely that any move forward will be stalled until both sides can find the right approach and agree upon terms of the discussion.

Although much of the discussion has focused on transmission, increasing interconnection encompasses more than just building new lines. Interconnection is about system stability and reliability; it goes beyond the scope of financially recoverable investment. Sustainable interconnection should reduce pollution, using fewer resources and in a more efficient manner to supply energy to a larger area. Independent System Operators (ISOs) should oversee service delivery from source to customer. An appropriate joint study between U.S. and Mexican interests may be to determine how, and by whom, electricity will be dispatched over the next 10 years.

5:00 – 5:10 PM

#### **Summary of Key Findings from Day One** *David Pumphrey, Deputy Assistant Secretary, International Policy Cooperation, USDOE*

We made progress in these discussions today, beyond what has been accomplished in the past. The debate has been further clarified and defined such that it comprises more than simple sales across the border, but broader concepts of reliability, reserve margins, and how we can quantify the value of these interconnections. The idea of system studies conducted jointly between ERCOT and CFE is new and very concrete. We have begun the discussion of project finance and have a better understanding of the related constraints. The NADBank and autonomous trust ideas are steps forward and will be pursued in subsequent communication.

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*Tuesday, November 19*

8:30 – 8:40 AM

#### **Welcome and Overview of Day Two**

*Ahmad Ghamarian, PhD, IIE Energy Group*

Using the same format as the first day, today's sessions will be chaired by Dr. Michelle Foss and the focus is on cross border interconnection in natural gas. These sessions will include a review the current situation of the flow of gas, a series of presentations to identify the obstacles to increased natural gas transactions across the border, the U.S. and Mexico's trade and development perspective, and a review of policy and regulatory aspects. Discussions were designed to bring about a set of recommendations to enhance and accelerate natural gas transfer between the two countries. During the wrap up session, Assistant Secretary Vicky Bailey and Undersecretary Francisco Barnes will provide a summary of the last two days and recommend the next steps to be taken.

8:40 – 10:15 AM

#### **Current Situation and Identification of Obstacles in the Natural Gas Sector**

*Michelle Foss, PhD, Executive Director, Institute for Energy, Law and Enterprise, University of Houston*

Today's natural gas discussion is a necessary follow on from that of electric power, knowing that we cannot provide the required electric power without the input of gas. Three main issues arise in this area: (1) the pipeline situation, interconnections and their use, and how the capacity is held and by whom; (2) Mexico's goal to increase supply, the role of multiple service contract in facilitating the supply growth, and the expectations and likely results of PEMEX; and (3) LNG development, which suffers from lack of public support.

8:45 – 9:15 AM

#### **Natural Gas Situation in the Border Region**

*Manuel Betancourt, Director General for Hydrocarbons Development, SENER*

Key Points: Mexico's trade in natural gas takes place exclusively with the U.S. Gas production in Mexico peaked in 1998, and has been declining ever since, despite an annual increase in domestic demand of 7%. The increase is comprised largely of growth gas demand in the electricity generation of 17%, most of which is based on natural gas fuel. The gap in supply is filled by gas imports. Infrastructure for distribution is concentrated in the Gulf whereas the North and Northwest lack the means for gas distribution entirely. SENER's strategy for natural gas development is three-fold: (1) Exploration and production of non-associated gas; (2) Reinforcing pipeline interconnections with the U.S.; and (3) Reopening of LNG terminals (principally located on the Baja Peninsula). *(presentation attached)*

#### **Natural Gas Trade and Development: U.S. Industry Perspective**

*James A. Tramuto, Vice President of External Affairs, Western Region, PG&E National Energy Group*

Key Points: The North Baja gas interconnection is an example of a cross border initiative that contains the essential elements of a successful project; that it: (1) makes good business sense, (2) adds stability and reliability to the system, and (3) adds strategic value to both countries. This pipeline into Mexico is a 220 mile connection through the El Paso system at Blythe, AZ, and has direct interconnects with power plants in Northern Mexico. A joint operating agreement between the co-owners, PG&E and Sempra Energy International, handles transactions on both sides of the border and has helped to solidify long-term agreements, which represent 98% of the pipeline capacity starting in January 2004. The project is financially due to the dependability of these long-term contracts. Benefits to both sides include reliability (particularly to the San Diego area), cleaner air, increased safety, economic development and the ability to meet future energy needs. Future plans related to the pipeline include expansion into the Arizona, North Baja and San Diego markets, as well as providing a backstop for future LNG development. *(presentation attached)*

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#### **Participation in distribution and transmission (Mexican Industry)**

*Claudio Urencio, Responsible for Pipelines, PEMEX Gas*

Key Points: Although there is physical integration of the North American natural gas market, there is a long way to go to create energy zones. With the current 11 interconnections on the northern border and the two under construction, capacity will reach 2.5 bcf/day, nearly enough to meet the gas demand of power industry by next year. Beyond border connections, however, there is an urgent need to reinforce distribution capacity to the rest of the system. The Estacion 19 to San Fernando and the two pipelines that connect it to the import stations at Reynosa and Argüelles are essential to the transport of imported gas to the rest of the system. In the peak periods, we are already at 90% of the pipeline capacity in the Reynosa area. Substantial business opportunities exist for private ownership in pipelines and compressions in the next three to four years to support this system. Furthermore, there is a need for a long-term vision for gas development. Current objectives are to import gas to specific consumers, but this plan does not integrate imports into the market. If the goal is to have greater flexibility to export gas within four to five years, it will be essential to have the capacity of a bi-directional system that will support the change in import/export pattern. *(presentation attached)*

9:15 – 10:10 AM

#### **Discussion and Comments**

Part of the discussion addressed the factors that explain the four-fold increase in natural gas exports to Mexico over a ten-year period. In 1991, the U.S. exported 200 mcf/day of natural gas to Mexico, which by 2002, reached 800 mcf/day. The rise in Mexico's imports was due to a combination of factors, the first being the decline in domestic production during an unusual growth in demand, during which PEMEX increased oil production, and used natural gas to aid in the extraction process.

Currently and in the future, the main demand driver of natural gas is the fast growing power sector. The decision was made 8 years ago to create all new power generation from gas turbine combined cycle plants, under the assumption that imports would be used to meet demand not met by domestic production. In the short and medium term, the power sector is dependent upon U.S. gas imports (through pipelines and eventually LNG). At the same time as the combined cycle decision was made, SENER and PEMEX moved ahead with the reconfiguration of the refineries to increase the amount of heavy crude oil that they could process, and reduce amount of fuel oil produced. Less fuel oil was then available to industry and electricity, helping to encourage the shift to natural gas in these sectors. Also passing tougher environmental rules on existing power plants caused at least 50% of oil-fired plants to convert to natural gas.

Demand on the industrial side is almost flat, as consumption of gas in petrochemicals is reduced, and the use of gas is concentrated in activities that are more valuable. Furthermore, industrial consumers have been paying the same price for imported as domestic gas, which has not provided an incentive to switch from combustible fuel sources.

Future exploration and production activities will focus on increasing the supply of non-associated gas on the market. The development non-associated gas is expected to happen under a Multiple Services Contract (MSC) mechanism. The bidding process for the first MSC will begin in the first quarter of 2003, with service expected in the second quarter of the year. The MSC will shrink the number of contracts historically granted for E&P activities from 1000 contracts over 10 years in one area, to 5-6 multi-year contracts in different areas that will be needed to effectively develop the gas resources.

Another driver of demand is newly licensed distribution companies in Mexico. With natural gas sector restructuring in 1995, attempts to develop third party markets have been gone awry as a result of volatile price responses. One of the considerations in pipeline development should be the need to moderate prices to allow competition in the market.

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#### **Natural Gas Sector: Policy, Requirements and Roles**

*Marcelo Chauvet, Director General, Compañía Mexicana de Gas*

Key Points: Drivers for gas development are multidimensional and include: producers, transporters, marketers and end-users. In Mexico, PEMEX accounts for 80% of gas consumption. Gas flows from US to Mexico are dominated by PEMEX's demand, which blocks private imports from entering the national system. Consequently, rules for private sales have not been established. Furthermore, there is a lack of risk management culture in Mexico where the industrialists expect that the government will control severe price fluctuations. Energy marketers can deal only with IPPs. The simulated market conditions with one state monopoly make regulation of the sector very difficult. Finally, it is difficult to assume that investment in LDCs is enough to stimulate the drivers, especially in a market that is dominated by PEMEX, such as in the Texas-Mexico region. (*presentation attached*)

#### **Discussion, continued**

PEMEX reserves full pipeline capacity to balance national system; it does not intend to block private imports or serve a single user in the area. The fact that PEMEX needs the full pipeline capacity only for this purpose points to the urgent need for additional private connections to increase current capacity. The sector needs investors who are willing to take some investment risk to integrate such projects into the system, releasing PEMEX from assuming the full risk of integration.

The analysis of the PEMEX monopoly in the Texas-border situation becomes more complex if you consider projects on the western border that are almost entirely private, functioning under power purchase agreements with CFE. The success of private investment in the western region raises the point again that there is a market and a supportive policy, private projects will develop. The matter relates then more to policy than to markets. Private development will continue to be a thorny issue if Mexican gas policy continues to support PEMEX as the market monopolist.

Currently the U.S. border area has the capacity to move 2.0 bcf/day of natural gas. There remains the question of how the pipelines going to be built in the U.S. to allow for increased exchange of gas with Mexico. Partnerships are key for the future of such investment. In performing risk analysis, a number of potential partners may surface on both sides of the border, each with its own strategic benefits that it brings to the project. As a function of risk mitigation in the two different business climates, partnerships are a possibility for incremental investment on both sides of the border, for export-import and compression infrastructure.

Regarding third party contracts for capacity, Kinder Morgan projects are founded on the basis that they connect directly to end users with long-term commitments. End users in Mexico are hesitant to make such commitments since they would be cutting their back-up supply lifeline with PEMEX. Given this situation, PEMEX made the commitment of long-term contracts with Kinder Morgan to make the increased supply of gas through the Mier-Monterrey Pipeline possible. PEMEX in this case helped to create the platform for a project that is open to expansion and third party users. Through an evolving regulatory regime, there is hope for an open access tariff that would serve as an incentive for other, more vulnerable end users than PEMEX to make these commitments for additional capacity in the future.

Pricing of future fuel supplies is also unresolved. Competition on both sides will determine a strong price; one that is likely higher than the current price. It is possible also that there is simply a cap on U.S. supply at 1.0 bcf/day, which will also affect price in a market with high demand.

10:30 – 12:00 PM

#### **Natural Gas Sector: Policy, Requirements and Roles**

#### **Mexican Perspectives**

*Armando Jiménez, PhD, Deputy Assistant Secretary of Energy Policy, SENER*

Key Points: The recent Mexican supply and demand forecast shows annual growth rate of 10.2% from 2002-2011. However, existing natural gas interconnections on the Mexico-US border are not developed for

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large amounts of international trade. There is a need for better understanding of different legal and commercial structures of each country. Both countries must set a joint policy agenda to facilitate the development of energy highways, thus allowing for a better flow of energy trade between them. Interconnection corridors will help to secure supply, reliability and enhance energy trade. (*presentation attached*)

#### **Regulatory Update**

**Raul Monteforte, PhD**, *Commissioner, Comisión Reguladora de Energía (CRE)*

Key Points: Energy reforms in Mexico, although limited, are contributing to new gas infrastructure and convergence in gas and power. Consistency and deeper reforms are needed to prevent failure. Cross-border energy trade and interconnections will expand significantly and flows will be bi-directional; hence there is a need for coordination to deal with contingencies, siting, permitting, energy corridors, public relations, and information. Unless there is a change of law and stated policy, CRE will consolidate the gas reform and its regulatory framework, including the final natural gas regime despite existing resistance. The regulatory agenda includes: five-year global review of regulated industries; modification of pricing and rate regimes; LNG, pipeline, and storage permitting; updating and enforcing Mexican gas codes; and active participation in energy reforms. (*presentation attached*)

11:00 – 11:30 AM (12:10 PM)

#### **Natural Gas Sector: Policy, Requirements and Roles**

#### **US Perspectives**

**Robert Cupina**, *Deputy Director of Energy Projects, FERC*

Key Points: FERC is the lead agency for the NEPA review of Section 3 facilities in Import/Export Natural Gas Facility Permitting. The level of NEPA review is dependent on the size and complexity of the project, and it considers any significant effects that the proposed facilities would have on the environment outside of the United States. Within the U.S., FERC coordinates with the USDOE, U.S. International Boundary and Water Commission, and other federal agencies with jurisdiction on a particular project, as well as the appropriate state agencies. Outside of the U.S., FERC staff coordinates with the Canadian National Energy Board (NEB) and the Mexican Comisión Reguladora de Energía (CRE). Recent permitting process streamlining initiatives include: clearly defined requirements; new regulations (minimum filing requirements, environmental report requirements); off-the-record communications; landowner notification; outreach efforts; and NEPA pre-filing. With the cooperation of all agencies involved, the permitting process can move quickly and smoothly. (*presentation attached*)

**Cliff Tomaszewski**, *Manager for Natural Gas Regulation, USDOE*

Key Points: The Natural Gas Act provides the basis for the U.S. regulation of international natural gas trade. USDOE regulates the international aspects of natural gas trade in the U.S. as a commodity, regulating the sale of the commodity as it leaves, or enters, the country. One change in the way that natural gas is marketed in the US appears in the request for “Blanket Authorizations”, indicated in most applications received today. Under a “blanket” authorization, the applicant is not required to identify their trading partners ahead of time. They are issued for a standard two-year term, allowing business on both sides of the border to engage in spot market transactions that have become the basis of a significant amount of the natural gas trade in the North American gas market. (*presentation attached*)

**Steve Pitner**, *Director of Gas Services, Texas Railroad Commission*

Key Points: Four regulatory divisions of the Texas Railroad Commission oversee the Texas oil and gas industry, gas utilities, pipeline, liquefied petroleum gas and rail safety, and surface mining of coal and uranium. There have been ongoing efforts between RRC and CRE to streamline the state-level regulatory processes, resulting in an MOU between the four Texas state agencies involved. The U.S.-Mexico relationship is based on shared mutual interest. It is important for Mexico to encourage investment in energy infrastructure to develop its resources, thus enhancing its market position as a producer and future exporter. The near term potential with Mexico lies in imports from the U.S. while infrastructure and

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production expands, and work continues on the long-term goal of Mexico exporting to the U.S. (*presentation attached*)

12:20 – 12:30 PM

#### **Strategies to Address Areas for Improvements and Necessary Reforms in the Natural Gas Sector**

##### **Case Study: U.S. industry permitting process**

*Michael Ward, President, Tidelands Oil and Gas*

Key Points: The Presidential Permit Process is required for "the full range of facilities" on the border, including, bridges, pipelines, tunnels, conveyor belts and tramways. The process involves eleven U.S. state and national agencies, each with its own complex set of required supporting documents and permits. The International Boundary and Water Commission performs a review of all of these supporting documents. Tidelands is in various stages of completion of this process for its new activities, which include the (1) Eagle Pass/Piedras Negras LPG Terminal and Pipeline Facilities; (2) Eagle Pass/Piedras Negras Natural Gas Pipeline; and (3) El Paso/Juarez Natural Gas Pipeline. The Railroad Commission has expedited the Presidential Permit Process, reducing the timeline from an average of three years to potentially seven months. On the Mexico side of the El Paso/Juarez connection, Tidelands is partnered with Conagas who obtained the three necessary permits in Mexico and has incorporated the Mexico side into its own private network. Tidelands is now locked into the Mexican market through 10-year contracts with Conagas, without posing the threat of future competition. (*presentation attached*)

12:30 – 12:40 PM

##### **Mexican Perspective: Status of interconnections and development**

*Steven Kean, President, Kinder Morgan Interstate Pipelines*

Key Points: Kinder Morgan is a pipeline company, 80% of whose earnings come from interstate transport of natural gas and liquid fuels. Corporate focus is on expanding facilities, using the existing asset base as the platform for growth and is supported by long-term contracts with fixed rates. Kinder Morgan fits into the U.S. and Mexico's overall vision of development of new fields (Burgos basin, Multiple Service Contracts), new delivery and storage infrastructure (Burgos basin), LNG Imports (Altimira, Pacific Coast projects) and interconnections with the US networks. The new Mier-Monterrey Pipeline interconnection project connects to the high pressure Kinder Morgan intrastate Texas pipeline, with a 375 mcf/day capacity and April 2003 service date. Benefits of this connection are the provision of: alternative natural gas supply source for increased fuel reliability; a possible pipeline connection for new Burgos Basin gas production; gas for electric power generation near Huínala; and connection to supply hubs in the U.S. These interconnections provide the opportunity for Kinder Morgan to provide a gateway for Canadian gas into Mexico. (*presentation attached*)

1:20 - 1:45 PM

##### **Discussion and Summary of Key Findings of the Workshop**

Led by *Mario Rodríguez-Montero, Deputy Assistant Secretary for International Affairs, SENER*

The discussions highlight five main arguments that are similar to those in the electric power sector analysis.

- There is a desire to build transportation corridors for cross border exchange, yet there are unresolved obstacles to this development such as investor risk, the difference in market rules between U.S. and Mexico, and implementation of market rules while including CFE and PEMEX as market participants.
- Power sector is driving gas demand in the foreseeable future. It would be wise to address unexpected change in natural gas supply, so as to avoid disruption of power generation from short supply. We need to explore a concept of competitive gas pricing that would make sense in Mexico.
- The PEMEX monopoly is a political reality, with impacts on pricing that create some volatility and impose constraints on U.S.- Mexico market development. Since there are no structural changes anticipated in the PEMEX monopoly position, gas sector stakeholders will have to find

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ways to work around the constraints. The administrative process for permitting is a nightmare on both sides of the border. There have been significant efforts to streamline these processes on the Texas state and Federal levels that aim to reduce the timeline between application and bringing projects on-line. Partnering with firms familiar with the business climate on the other side of the border may also ease the process and reduce the administrative burden on the project.

- Finally, obtaining energy security and reliable supply are commercial development priorities for both countries. Evidence of bilateral cooperation to ensure energy supplies was seen in the recent hurricane disasters in Mexico and subsequently in the U.S. If the risk of return on long-term projects and payments is minimized, private investors are more willing to enter the market to meet the existing and future demand, which should only add to the security and reliability of the system.

12:40 – 1:20 PM

#### Discussion

At the start of this discussion, the question was posed from USDOE: What can the agency do to kindle the process and smooth the path for increased interconnection and infrastructure investment?

One of the biggest obstacles is the energy market being so severely politicized that equity is running away from energy. It will take time to restore a market/equity balance to the sector, but in the meantime, this environment is extremely detrimental to future investment in infrastructure and services. It would help to calibrate the debate in both the public and private arenas, to remove the extreme behaviors from analysis to prevent the entire industry from coming undone. Despite our limited influence on this issue, the more independently efforts can be made to depoliticize the issues and market, the greater positive impact we may have on the market.

Contrary to the power experience, there are some aspects of the natural gas sector which are working very well and do not need to be fixed. Certain other areas require work; such as the permit process and pricing structure. In this case, pricing limitations result from bringing a competitive market together with a monopolistic structure. The ensuing price structure keeps investors from being interested.

The pricing conflict originated from the Mexican government's decision to create demand that would carry over to create an increase in supply. Reform in 1992 allowing IPPs brought in investment to create this demand, and yet the expected increased investment in gas infrastructure and supply did not follow. To resolve the unbalance and fix the relationship with the market, gas prices were equalized no matter the origin. This solution worked for a short time until the deficit was leveled. It is now time however to determine the appropriate price for domestic gas versus imported supplies.

The simulated market pricing strategy is most feasible in Mexico despite some inherent volatility over time. Alternatives include a soviet-style fixed price and a fully market-based price that refers to cost. The market effects of a centralized price fixing mechanism make the model untenable. The market-based price is not feasible in Mexico because of legal and institutional constraints. The simulated market pricing structure takes the monopoly situation into account and uses a market reference, the Houston Ship Market or the Valero index (though less appropriate). The simulated market price is not a "magic fix", but adhering to a market reference and working through the regulatory process, the sector will continue to open to private investment and competition in price, transportation and service.

Resolving the complex problem of the arbitration point of the reference would further improve the pricing mechanism. Categorically moving the arbitration point further south in Mexico, when production is in the north, would negatively impact the Mexican market. This act would grant the state monopoly to collect additional revenue on infrastructure in the south, causing southern industrial activity to be less competitive. It is thought that in the long-term there could be arbitration regions that would help to equalize global gas tariffs.

Overall, there is public-private support for competition in the north between imports and domestic gas. The reality remains, however, that private imports do not have open access to the Mexican/PEMEX system, and

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that U.S. costs of transportation are not recognized in the pricing structure. Given these conditions real competition is not possible. One proposed idea to promote competition under the inherent PEMEX environment and insert imported gas into the Mexican system (like what will happen with LNG), involves opening 15% of reserve capacity to private contracts and marketers. This new entry gas will force greater interconnection and offer PEMEX increased security.

Expansion of PEMEX gas may affect the overall market balance, and the speed of the development will determine degree of impact. A change in efficiency that will minimize the impact is not needed as much in government as it is in PEMEX operations. PEMEX has the appropriate financial resources to expand to the projected production point efficiently and quickly, due to reduced administrative procedure. Meeting production targets will put the major pipeline capacity back into balance in Mexico, and new pipelines can be placed to better distribute the gas and eventually export to the U.S. Gas imports introduced to the south in Altamira will allow gas produced in the north to be exported. Government's role is also to continue facilitating gas connections along the northern border.

The market however is growing in scale, complexity, flexibility and complementarity; and in the gas sector, we have seen that companies can take some risk in demand and succeed. They key is to plan ahead as a North American market to reduce risk of price volatility and avoid transportation instability across the border. This is the major role for government: to reduce the uncertainties through coordinated planning and forecasts, working from the same information and shared vision, yet continuing to make decisions and craft policy appropriate to the country that help fulfill the vision.

1:45 – 2:00 PM

#### **Wrap-up – Next Steps Toward A Strategic Vision**

*Vicky Bailey, Assistant Secretary for International Affairs, USDOE*

We have accomplished a great deal over the last two days, discussed the challenges in expanding cross border trade, and the obstacles to developing more interconnections and meeting demand. Meeting this demand will require significant investment in energy resources and infrastructure. Attracting this investment is contingent upon our addressing the different regulatory, technical and market structure issues so that our efforts together will respect the different strengths and unique needs of each of our nations. We can move forward through transparent and compatible regulations, which do not need to be the same, but need the capacity to support a more efficiently functioning energy system. We have heard the concept of trust, in relation to the NADBank, yet we should not disregard its literal meaning as it applies to this process. We have also heard that partnership is the key to future connection and integration. With a better understanding of our nations' outlooks and processes we can most effectively develop our economies. Perhaps highlighting the reliability aspects of this debate will lead to increased interconnection. In recognition of the different opinions and issues along the U.S.-Mexico border, we plan to hold additional workshops further to our west, to focus more on the issues specific to these other areas. We hope that through this public-private dialogue and exchange of ideas we can develop a list of obstacles and opportunities that will guide us in our efforts to develop cross border energy trade. We appreciate the candor of these discussions, as public-private input is invaluable to this dialogue. It is important to continue this dialogue, sharpen our focus, and institutionalize solutions that transcend administrations, so that it doesn't take another twenty years to reach this level of cooperation. Thank you for interesting and insightful two days. I am confident that we are on the right track to meeting the growing energy needs in border region in our two countries. *(Comments attached)*

*Francisco Barnés, Undersecretary of Energy Policy and Technology Development, SENER*

This is an issue that has been discussed by both countries' governments for a long time, and we are still facing some of the same stumbling blocks that continue to prevent more active interconnections. In Mexico we are convinced that energy markets in North America will have to develop quickly, and that countries' can no longer plan development energy sectors independently without regard to what is happening on the other side of the border. It is in our best interests to have interconnections that allow energy markets to

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develop, and to capture the trade opportunities. Through time the pace of expansion and differences in market development are difficult to reconcile to other regions without interconnections. The stronger the interconnections, the more secure, reliable and competitive the energy markets can be. We still have complex problems and still have to work hard to solve issues to achieve such a level of energy market development. We have the commitment on both sides of the border to understand the stumbling blocks, the needs and perceptions of the other side. We continue to believe that business opportunities should be evaluated on a case-by-case and system-by-system basis, to identify benefits of interaction with other systems. The role of the operator is important here because they are a part of the solution and decision making process. We should try to develop a common strategic vision on electricity (between the U.S. and Mexico) and gas development (between the three NAFTA countries), to convey the right signals to those involved in the daily decisions about future investment. Government is not investing directly (only through state-owned companies), but has responsibility to define vision in key areas. These visions are more productive if shared, taking into account the points of view and differences of the other side. This meeting is a very important step in moving toward a common vision. Thank for your participation and interest in developing this area, and for important contributions you have made to these discussions.

#### Closing remarks

*Ahmad Ghamarian, PhD, IIE Energy Group*

On behalf of IIE, we thank all of the participants who made these two days very productive, the U.S. Department of Energy, and Secretary of Energy in Mexico, in giving us the opportunity to put together this workshop and assist in this collaborative process. The materials and conclusions from this workshop will be made available to all the participants in electronic format so as to show the results and success of this dialogue.