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**US-Mexico Electric Sector Restructuring and
Crossborder Energy Issues:
A Summary Report**

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A EXECUTIVE SUMMARY

This summary report will serve as an update on recent developments in Mexico with regard to the electric sector. There are three main issues areas:

- The general political climate is not conducive to progress on electric sector reform
- Progress of administration initiatives in Congress has been slower than anticipated
- Developments in the electric sector
- Trends in cross-border electricity trade suggest declining levels since 1998
- Environmental and Job impacts from generation and transmission development projects

B GENERAL POLITICAL CLIMATE

The general political climate in Mexico is marked by growing dissatisfaction with Vicente Fox's performance in office so far. There are numerous factors contributing to this sense of betrayal by Fox and his team.

- *Image problems.* The administration has suffered because of perceived ethical lapses, the most important of which is the so-called "Toallagate," involving allegations of exorbitant spending on the remodeling and outfitting of the presidential quarters at Los Pinos, as well as irregularities in the contracting arrangements. In addition, the administration has been tarred with an image of frivolity fed by reports of the president's marriage to Martha Sahagún, his former spokeswoman, as well as the negative commentary on the president's overseas trips, as well as remarks of Carlos Abascal, the outspoken Secretary of Labor.
- *Poor economic performance.* The Mexican economy was virtually at a standstill in the second quarter, leaving growth barely positive for the year. The administration has repeatedly been obliged to downgrade its forecasts for GDP growth on the year. This, combined with evidence of significant under-spending of budgeted resources in the first half, have led to sharp criticism of the administration's economic program.
- *Role of the first lady.* The president's marriage to Martha Shogun may have eliminated one liability – that of her perceived incompetence as spokeswoman because of remarks that contradicted other senior officials as well as the president – by moving it elsewhere. As first lady, Shogun has begun to engage in diplomacy and public declarations that could create similar problems.
- *Opposition to the Indigenous Rights Law.* Indigenous peoples' opposition to the version of Indigenous Rights Law passed by Congress, and widespread opposition to

the impact of Fox administration and earlier policies on the agricultural sector has led to significant disruptions in Mexico City. On August 8, a march on Mexico City culminating weeks of strikes and forced closures of several ministries contributed to a sense that the city, and the country, were descending into chaos and were not being governed by a "firm hand."

- *Dissatisfaction within PAN.* It is well known that the PAN has been dissatisfied with the role it has played in the administration to date. Given the president's image problems, there appear to be efforts afoot within the party to coordinate defense of Fox among PAN delegates in Congress, but at the price of exercising greater influence over the president's agenda and policy initiatives. Some commentators have even speculated that the PAN's desire to reassert its authority might be so great as to lead to the emergence of Fox as a "figurehead president," or that the PAN might even seek legislation that would permit Congress to select an interim president to replace Fox – but both these possibilities seem far-fetched, most especially the latter. However, the fact that they are even mentioned does underscore the perception in the country of a "power void."

C PROGRESS OF ADMINISTRATION INITIATIVES IN CONGRESS

The Fox legislative agenda is centered on two initiatives, the fiscal reform, which is vital to the success of the entire Fox program of structural and administrative reform. At present, however, both initiatives have encountered stiff opposition and are moving forward far more slowly than initially expected.

- *Fiscal reform.* Congressional and public opposition to certain aspects of the Fox reform package – especially the application of the 15% VAT to medicines and food – will have a substantial impact on the actual law passed in Congress. Fox administration assertions that passage is imminent seem to be excessively optimistic. A more likely scenario calls for the reforms to be passed in the context of the annual budget legislation, which must be passed by the end of the year. The three major parties in Congress have been working on the compromise legislation to accomplish this, and senior officials from the PAN, especially, have signaled the need for bipartisan action to conclude the process. The compromise will probably include dropping the proposal to levy the VAT on medicines and food, and harmonize the VAT applied on the rest at 12% or 13% (currently the rate varies between 10% and 15%). States might be allowed to levy a state VAT of 2% to 3%, and income tax rates would also experience lower cuts than originally proposed.
- *Electric sector reform.* The comments made by senior legislators about the electric sector reform suggest that the administration may be obliged to back down from earlier plans for more aggressive changes. The Fox administration has had to give up on several issues related to the energy sector this year, so this expectation does not seem out of place. In May, Fox abandoned plans to have four private-sector representatives join the board of PEMEX after Congress passed a joint resolution

censuring the action. Later, Congress challenged the administration's effort to change the rules regarding power sales to CFE by private-sector companies; the matter has been taken to the Supreme Court, and all bets are that the high court will side with Congress against the administration. The proposed change involved removing limits on sales of power to CFE from cogeneration (and small-scale production) facilities, now capped at 20 MW.

Given the failure of these relatively benign measures, and the Fox administration's stated policy of avoiding more radical measures (privatization of any part of CFE assets, privatization of PEMEX) in an effort to gain the confidence of the nationalist elements within the PRI as well as the PRD, it appears that any substantive change in the energy sector is unlikely. While this certainly applies to reforms requiring constitutional modifications it may even apply to changes involving more administrative matters.

D DEVELOPMENTS IN THE ELECTRIC GENERATION SECTOR

While progress on the electric sector falters, private companies already engaged in the electric sector appear to be preparing for the long haul. Companies that have had a limited involvement to date may even be suspend further activities until there is greater clarity regarding the future of the electric sector.

For example, representatives from AES México and El Paso Energía in Mexico City have suggested that companies such as AEP may be suspending development activities in Mexico for the near term, due to lack of clarity in the sector as well as the relatively limited financial returns available to investors. This latter issue has emerged as one of the major factors explaining the relatively limited involvement of U.S. energy companies in the Mexican electric sector as compared with the very prominent role of European companies, especially from Spain and France, as well as Canada.

Several market participants, including Cintia Angulo of Electricité de France (EdF), have noted that the level of participation in CFE-sponsored bids has steadily declined over the last 18 months to recent CFE bids with only one bidder which had to be re-bid and in some cases no bidders, leading to the conclusion that CFE will not be able to obtain the same favorable bid offer prices as it has in the past. Angulo argued that this will lead to higher prices for electricity to CFE, and in turn to new measures to open up the market and create more competition. She was also highly critical of the regulated and controlled process behind the bids, which has created major difficulties for bidders due to unexpected permitting and/or logistical issues. She reported, for example, that CFE had indicated to EdF that water could be obtained from a well near a proposed site; subsequently, EdF verified that the well had nearly been covered over by a highway widening project near the site, creating a significant new construction problem for the project.

Another observer suggested that the limited participation in the CFE-sponsored bids may signal that the existing participants have reached their limit on Mexico exposure, leading to the conclusion that the new bids will have to offer more favorable prospects in order to attract investors. At the same time, it is well known that other potential market entrants – such as Enron and Sithe Energies from the U.S. – have focused exclusively on the large industrial cogeneration opportunities as opposed to the CFE bids.

In this context, the case of El Paso may turn out to be a special case because of the firm's involvement in two areas of the market – gas sales as well as electricity sales. In this sense, El Paso may well be in a better position to generate profits in the Mexican market than other U.S. companies, with the exception of Semptra and any other gas and electric utility that might enter the market in the future. In fact, the attitude at El Paso Energía appears to be one of general satisfaction with the status quo. Bob Perez said that he did not see much likelihood of significant changes in the sector, given the reluctance of the Fox administration to take on the nationalists within the PRD and PRI in Congress. He dismissed the measures that currently make up the administration proposal as being little more than “window dressing.” He did not give much importance to the argument that declining participation in CFE bids will necessarily lead to higher prices and then pressure for greater participation. Nor did he consider that cogeneration projects might offer a realistic alternative to the need for new generation capacity in the electric sector operated by CFE. For the foreseeable future, he argued, the CFE bids – which are “easy to understand and participate in” – will remain the only meaningful game in Mexico's power sector.

In light of these comments, it seems most appropriate to expect that private-sector involvement in Mexico's electric sector will remain limited to CFE-sponsored bidding for the time being. It remains to be seen, however, whether the skeptical view of investor returns or the more optimistic one espoused by Perez of El Paso will prevail. CFE's track record so far this year – several bids have been declared invalid or have been awarded to a single bidder – does not appear to favor the optimistic view.

Finally, here is a quick round-up on the various cross-border projects that are underway:

- **Semptra** is proceeding with the permitting and completion of the facility at Mexicali. Made headlines recently when it announced that the facility would adhere to California emissions standards – something that Intergen had not yet done.
- **Intergen** has been forced to announce that it will install measures to control NOx emissions as well.
- **AES** is proceeding with permitting for its facility in Rosarito, and has hired consultants to begin on the EIAs and other permitting requirements.
- **AEP** is reported to be dropping further involvement in Mexico, despite having spent considerable amounts on land acquisitions.
- **PNM** continues to say that it is moving forward, but has reported significant difficulties in obtaining the necessary permits.

Table 1 outlines some of the major generation projects that are currently in development by non-Mexican firms.

Table 1: Major Generation Project currently under development by non-Mexican based firms

Project Name	Project Owner	Percent Owned	City	State	Size in MW	Cost (US\$)	Project Status	Estimated Commission Date	Fuel Type	Technology	Export/Import
Altamira-2	Mitsubishi Corp. Electricite de France	49% 51%	Altamira	Tamaulipas	495	\$300,000,000	Development	2002	Gas	CCGT	CFE
Altamira 3 & 4	Iberdrola 1	100%	Altamira	Tamaulipas	1,036	\$590,000,000	Development	2003	Gas	CCGT	CFE
Campeche	TransAlta Energy	100%	Palizada	Campeche	275	\$216,000,000	In Construction	2003	Gas	CCGT	CFE
Chihuahua 2	Mitsubishi	100%	El Encino	Chihuahua	450	\$274,000,000	In Operation	2001	Gas	CCGT	CFE
Chihuahua 3	TransAlta Energy	100%		Chihuahua	259	\$192,000,000	Development	2003	Gas	CCGT	CFE
Bajío (El Sauz) Project	InterGen AEP Resources	50% 50%	Queretaro	Guanajuato	600	n/a	In Construction	2001	Gas	CCGT	CFE
Energía de Baja	InterGen	100%	Mexicali	Baja California	895	n/a	Development	n/a	n/a		n/a
Ambos Nogales Generating Station	Maestros Group	100%	Nogales	Arizona	500	n/a	Development	2004	Gas	CCGT	CFE
Termoelectrica de Mexicali	Sempra	100%	Mexicali	Baja California	500	\$ 250,000,000	In Construction	n/a	Gas	CCGT	Export to U.S.
AES	AES CFE	80% 20%	Rosario	Baja California	750	\$ 550,000,000	Development	n/a	Gas	CCGT	n/a

As for the U.S.-Mexico bilateral discussions, it appears that the Bush administration's slow staffing up process has limited the extent of activities to only the most preliminary conversations between DOE and SENER. During the Fox visit there was very little discussion of energy issues at all. There are other policy issues – such as immigration – that are ahead of energy in the bilateral relationship.

E TRENDS IN U.S.-MEXICO ELECTRICITY TRADE

An evaluation of trends in U.S.-Mexico electricity trade is complicated by the apparent lack of comprehensive data for flows between WSCC and ERCOT and Mexico. Data on aggregate trends in cross-border trade that are normally published by the Department of Energy's Office of Fossil Energy are not yet available in official form for 1999 and 2000.

However, Steve Mintz of the OFE, reported that there appears to be a slight increase in exports between 1999 and 2000, and a more substantial one in the case of imports. He noted that the results were still sketchy due to the fact that not all the reports expected from electric utilities have been received. Mintz reported a total figure of 1.14 million MWH of exports in 1999, and 1.2 million in 2000, with 303 MWH in imports in 1999 followed by 2,400 MWH in 2000. Figures reported by DOE's OFE are presented in the following table.

Table 2: Electricity Trade between Mexico and the U.S.

NERC Region	Imports (from Mexico) in MWh		Exports (to Mexico) in MWh	
	1997	1998	1997	1998
ERCOT	6,236	364	2,811	4,625
WSCC	16,493	10,885	1,500,896	1,968,578
Total	22,729	11,249	1,503,707	1,973,203

If the figures that Mintz mentioned are accurate, the aggregate levels of trade will have remained at sharply lower levels in the case of both exports and imports. Such a trend might be attributable to rapidly increasing demand within Mexico and within the U.S. reducing the amount of power available for transfer to the other side of the border. In the case of flows from Mexico to the U.S. (shown as "Imports from Mexico"), these have declined over the last several years from a high of 2.2 million MWh in 1995 as Mexico's operating margins have tightened, leaving little capacity available for export. Meanwhile, the similar conditions prevailing in California (which does the vast majority of trade with Mexico) in 1999, and especially 2000, would limit the amount of energy exportable to Mexico.

IEA data indicates that imports of Mexican energy generation increased dramatically during the energy crisis of last fall and spring, while exports to Mexico have decreased during the same time.

Table 3: Mexican Energy Imports and Exports, TWh

	1999	2000	2000				2001		
			1Q	2Q	3Q	4Q	1Q	2Q	3Q
Imports	0.7	1.1	0.2	0.5	0.4	-	-	0.1	0.2
Exports	0.1	0.2	-	-	-	0.1	0.1	0.1	-

Source: Monthly Energy Survey, International Energy Agency, September 2001

Table 4: Percent change from the same period of the previous year

	1999	2000	2000				2001		
			1Q	2Q	3Q	4Q	1Q	2Q	3Q
Imports	-57%	65%	755%	419%	-10%	-85%	-97%	-73%	-46%
Exports	63%	55%	5%	5%	19%	262%	200%	30%	72%

Source: Monthly Energy Survey, International Energy Agency, September 2001

While the data indicates that Mexican imports of U.S. generated energy are decreasing, several firms are actively pursuing development opportunities that will enable more sales to Mexico. At present, the major firms exporting electricity to Mexico are: Allegheny, Aquila, PG&E and NRG.

F DEVELOPMENTS IN THE ELECTRIC TRANSMISSION SECTOR

CFE has been invited to join an electric power pool in Texas (the Electric Reliability Council of Texas) in a move that could eventually lead to increased electricity trade between Texas and fast-growing northern Mexico. Importing power from the United States will allow Mexico to invest capital in transmission and distribution. Currently, ERCOT has only limited electricity import or export capacity between Texas and Mexico, but there is interest in expanding the capacity due to forecasts of strong Mexican power demand growth.

The Vice President's Report of the National Energy Policy Development Group has identified transmission as an area for targeted growth. Several firms are working to connect South California and Texas to the Mexican Grid.

- **NRG** has designed and proposed the construction of a 500,000-volt electric transmission line that would carry 1000 MW south to Mexico and is expected initially to operate at that capacity. It would originate at the Palo Verde Nuclear Generating Station, 30 miles west of Phoenix, and extend southwest approximately 177 miles, crossing the U.S-Mexico border near Calexico, California. The project was scheduled to begin operation in early 2001, but is still awaiting regulatory approval.
- **Sempra Energy Resources** has applied for a Presidential permit to construct a new electric transmission facility between San Diego Gas and Electric Company's (SDG&E's) Imperial Valley Substation in Imperial County, California, and the Termoele' ctrica de Mexicali (TDM) power plant. Sempra will initially export electricity to Mexico for the purpose of providing "black start" capability to the TDM power plant and for providing ancillary equipment power when the facility's electrical generating equipment is not in operation. Once TDM is operation it will export 100 percent of its generation capacity to the U.S. (500 MW, 700 MW peak). On the same transmission lines.
- **Tucson Electric Power Company (TEP)** has applied to federal regulators to construct, connect, operate and maintain a double-circuit, 345,000-volt (345-kV) alternating current electric transmission line across the U.S. border with Mexico. The two-circuit system would originate at TEP's existing South Substation located approximately 15 miles south of Tucson and interconnect with the Comision Federal de Electricidad at CFE's Santa Ana substation.

- **Enron** had plans to build a 300 MW high voltage direct current Converter Station and associated 230-kV transmission line to transmit electricity from the service territory of Public Utilities Board of Brownsville Texas to territory of Comision Federal de Electricidad. It is uncertain what impact the bankruptcy of Enron will have on the project. It is likely that the project will be on hold until a new project owner and developer can be found.

- **Maestros Group** has plans to develop a 500-MW combined cycle natural gas plant in Nogales, Arizona for the express purpose of delivery of energy to Mexico. The project will not be connected to the U.S. energy grid, but instead deliver directly to the Comision Federal de Electricidad system via a double circuit 230-kV transmission line in Nogales, Mexico.

G ENVIRONMENTAL IMPACTS

No major environmental hazards arise from these transmission projects. Limited air pollution may result from the burning of vegetation to clear the line route. The line will cross the Colorado River, but should not harm the river in any way. The completed line should not produce any harmful environmental impacts once operational. No future research or analysis is necessary.

Generation project along the border do have some potential environmental hazards associated with their power production. These include:

1. Lower air emission standards in Mexico could impact NO_x SO_x and CO₂ levels in the U.S.
2. Water discharged from power plants can impact river ecology due to the change in temperature. Regions where there are substantial clusters of generation projects, such as Mexicali, could be impacted by this phenomenon.
3. Generally speaking, local species could be impacted by air and water pollution as well as the destruction of natural habitate due to construction.

The U.S. and Mexico currently have a cooperative agreement to explore the use of technologies that should reduce the level of pollution attributed to power generation in the Cross-Border region. This agreement is focusing on the following areas:

- Environmentally friendly technologies for the discovery, characterization, production, processing, and transportation of fossil fuels;
- Advanced, high-efficiency power systems, including:
- Advanced environmental control systems for conventional and advanced power systems, including: particulates; nitrogen oxides (NO_x); sulfur oxides (SO_x); hazardous air pollutants; and greenhouse gases;
- Advanced central-station power and/or fuels production systems with very low emissions;

- Other environmental technologies for assessment and remediation of ground water and soils, including acid mine drainage, affected by fossil fuel production and use.

While this agreement goes a long way to promote the use of 'clean technologies' more attention needs to be paid to the actual (current and future) impacts on the cross border environment.

H EMPLOYMENT IMPACT

The U.S. based share of generation projects currently underdevelopment represent approximately \$2.5 billion dollars worth of investments in Mexico. Research by the EPA shows that for every \$1 billion worth of exports, 17,000 U.S. jobs are created (U.S. EPA, 1995). Based on this figure, we can project that 42,500 U.S. jobs will be created from these activities. We can also expect the transmission line development projects to also contribute to job creation, but investment figures were not available for these projects so we were unable to calculate this figure. In the future efforts should be taken to better estimate the cost of these transmission projects and the subsequent number of jobs that will be created from these activities.

Dan Vincent

From: Ned Hoyt [hoyt@eic-dc.com]
Sent: Saturday, January 12, 2002 1:23 PM
To: Vincent - Dan (dvincent@nexant.com)
Cc: Phil Doyle; Moscarella - JP (AOL) (Moscarella - JP (AOL)); Atulya - Dhungana (adhungan@nexant.com)
Subject: REACH document in Spanish



PEMEX-REACH-Spanish draft-0111...

Dan:

Attached please find the translated REACH report. The modifications you made to the English ES (references to tons of emissions reduced, etc.) have been incorporated into the Spanish. I have some suggestions for changes/checks to the English (which would make corresponding changes to the Spanish necessary where noted):

1. The details of the project costs as presented here may not be correct. The relevant text is highlighted in yellow. As noted earlier, Edgar Salazar at Alesco has commented to me that these figures don't sound right to him. I have asked him to verify the numbers and pass them along. He has been trying to do this with EPT for two weeks. Since this correction may be obviated some other way, I am sending this along to you now. Please let me know if you can verify what the accurate cost presentation is so that point can be finalized without waiting for Alesco and EPT. Whatever the final story, the English and Spanish will have to be harmonized.

2. Edgar has indicated that as far as Alesco/EPT are concerned, Phase II is complete. There are references in the English text to Phase II in the future tense. Here, it's a question of definitions (what is/is not part of Phase I, Phase II, etc.), and making sure that the references are internally consistent. These references have been changed to past tense in the Spanish. You will want to check if the reference to Phase II at the close of the third paragraph of the ES (page 1) is correct.

3. There are some edits I would suggest to the ES as revised by you:
-- Page 2: PEMEX is "Mexico's state-owned oil, gas, refining and petrochemicals company," not just "petrochemical company," as noted in middle of the first paragraph.
-- Page 5: in the second paragraph "Estimates of ... ", the verb "is" does not agree with plural "estimates." I suggest changing one or the other.
-- Page 6: in the first complete paragraph, the sentence "The combination of collective resources, at times, represented different views. But, it was this collective difference ..." is difficult to understand. I suggest: "The members of the diverse PEMEX-EPT-USAID team, who were based in geographically disparate locations and represented different institutional perspectives, learned from each other and eventually arrived at a common understanding of the engineering problems posed by the project. Hence, the diversity of the team was ultimately the source of strength and contributed to the success of the project." Perhaps this is more cumbersome and wordy, and could be cut down. But the original should be altered because it is hard to tell what is meant. The text in Spanish will have to be adapted to fit the English, once modified.

Regards.

Edward A. Hoyt
Vice President
Econergy International Corporation (EIC)

1925 K Street, NW, Suite 230
Washington, DC 20016
Phone: 202-822-4980 Fax: 202-822-4986
Visit our website at www.eic-co.com