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ENERGY AND PETROCHEMICALS IN THE NORTH AMERICAN FREE TRADE AGREEMENT

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NOTES

On December 17, 1992, the leaders of the United States, Canada, and Mexico signed the proposed North American Free Trade Agreement (NAFTA). Copies of that document, *North American Free Trade Agreement Between the Government of the United States of America, the Government of Canada, and the Government of the United Mexican States*, are available through the U.S. Government Printing Office. Unless otherwise noted, all references to NAFTA refer to that document.

Numbers in the text and tables may not add to totals because of rounding.

All years refer to calendar years.

PREFACE

The Congressional Budget Office (CBO) has prepared this analysis of the effects of the proposed North American Free Trade Agreement (NAFTA) on energy and petrochemical markets at the request of the Subcommittee on Energy and Power of the House Committee on Energy and Commerce. This paper expands on a section of a broader analysis of NAFTA prepared by CBO for the Senate Committee on Finance (*A Budgetary and Economic Analysis of the North American Free Trade Agreement*, July 1993).

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SUMMARY AND INTRODUCTION

The United States negotiated the North American Free Trade Agreement (NAFTA) with Mexico and Canada in an effort to promote trade in goods and services and the flow of capital among the three nations. The Congressional Budget Office (CBO) has prepared a comprehensive analysis of the effects of NAFTA on specific industries in the United States and on labor markets, the environment, and the macroeconomy.[1] This paper expands on a section of that broader analysis, discussing in more detail the likely consequences of the agreement for trade in energy and petrochemicals. The paper gives more attention to the enforcement provisions of the agreement, to the remaining institutional barriers to trade with Mexico, and to specific provisions of the agreement concerning trade with Canada. The focus of the analysis is on energy and petrochemicals trade with Mexico.

The immediate benefits to the United States from enhanced energy trade with Mexico might be small, but the agreement would represent an improvement over the status quo. Almost as important as net trade gains is the likelihood that NAFTA would not hurt any major U.S. energy industries or groups of energy consumers.

Restrictions on Energy Trade with Mexico Remain

For the most part, the energy chapter of NAFTA sets out exceptions to the principles of free trade with Mexico that the rest of the agreement embraces. In particular, NAFTA would do very little to increase U.S. access to Mexican oil resources, even though imports of crude oil account for over half of the total dollar value of U.S. imports from that country. For trade in oil with Canada, however, NAFTA generally reaffirms provisions of the Canada-United States Free Trade Agreement (CFTA) that promote access to Canadian oil and gas.

Energy imports from Mexico would not be affected by NAFTA--those imports are already virtually unrestricted by the United States. And the agreement does not address U.S. restrictions on the export of crude oil to Canada or Mexico beyond the small volume of Alaskan oil exports allowed in CFTA.[2] But the agreement might help boost the relatively low levels of U.S. energy and energy-related exports to Mexico and U.S. investments in Mexico.

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1. Congressional Budget Office, *A Budgetary and Economic Analysis of the North American Free Trade Agreement* (July 1993).

2. U.S. law prohibits the export of crude oil from the Alaskan north slope and requires export licenses for the export of other crude oil. The Department of Commerce has issued licenses for the export of only 25,000 barrels per day.

Investments Might Benefit More Than Product Exports

The direct provisions of NAFTA would be more effective in promoting U.S. energy investments in Mexico than they would U.S. exports of goods and services.[3] The agreement contains numerous tariff reductions by Mexico on energy and energy-related goods, but the goods that would normally benefit from lower tariffs would remain largely constrained by nontariff barriers--including important restrictions on the operation of free markets in Mexico.

By addressing nontariff barriers, NAFTA's specific provisions for energy, investment, government procurement, and competition point the way to new trade and investment opportunities with Mexico. Tangible evidence of new opportunities includes Mexico's commitments to ease restrictions on imports of natural gas and basic petrochemicals, to allow investments in production of secondary petrochemicals and in certain types of businesses that generate electricity, to protect U.S. investments from discriminatory treatment by Mexico, and to open the market for contract services with the Mexican government's energy monopolies. (Basic petrochemicals, defined in Annex 603.6 of NAFTA, include products such as propane and butane; secondary petrochemicals are all other petrochemicals.) The degree to which U.S. businesses could take advantage of new opportunities, however, would depend on a series of enforcement provisions--some of which are very weak--and ultimately on the good intentions of the Mexican government.

Creating an Infrastructure for Future Trade

An important intangible benefit of NAFTA is that it defines the rules of competition, even though those rules may not in themselves guarantee increased trade. In particular, Mexico would agree to accept disciplines established under the General Agreement on Tariffs and Trade (GATT) concerning energy trade (although it would exempt most petroleum products from those disciplines). Mexico would agree to restrictions on the anticompetitive practices of its state energy monopolies in commercial areas outside the officially monopolized markets--an accomplishment that goes beyond GATT in establishing a potential framework for future trade negotiations with other centrally planned economies. And Mexico would revise and clarify its legal procedures for the design and award of government procurement contracts.

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3. An economic link also exists between investment and exports. A general effect of NAFTA would be to promote an increase in total investment (in both energy and nonenergy projects) by the United States and Canada in Mexico. Increased capital flows associated with this investment would lead to a near-term appreciation of the Mexican peso, which would, in turn, further promote the export of U.S. goods and services to Mexico.

Future trade benefits might also derive from the current vagueness of some of the language in NAFTA. During the negotiation process, Mexico had pushed for more specific, more restrictive language on several of the energy provisions. The fact that the negotiators could settle on less specific language--which may be interpreted by different parties as more or less restrictive--means an agreed-upon framework can be in place for further trade liberalization. For example, NAFTA's provision for performance clauses in service contracts may ultimately be interpreted as allowing U.S. drilling firms to own part of the oil or gas they discover in Mexico, even though Mexico does not accept that interpretation now.

Institutional Impediments to Negotiating an Agreement

The fact remains that what was left out of the agreement was far more significant than what went in. The difficulties of negotiating on energy trade reflected three major obstacles. Mexico was unwilling to revise its constitutional prohibition against foreign ownership of energy resources; the government had no desire to weaken the state monopolies in oil, natural gas, and electricity; and the government wanted to adhere to central planning for the development and use of the nation's energy resources. These obstacles remain and underscore NAFTA's accomplishment as only a first step toward free energy trade with Mexico.

Mexico has recently taken several actions, however, that indicate a willingness to relax its constitutional restrictions on the foreign ownership and control of its domestic energy resources--even without the ratification of NAFTA. For example, in August 1992, Mexico issued regulations that expanded the list of secondary petrochemicals in which limited foreign investment is allowed. In April 1993, a U.S. firm announced an agreement with Petroleos Mexicanos (PEMEX) to build and jointly own a plant producing a gasoline additive for which foreign investment was otherwise prohibited.[4] In May 1993, PEMEX negotiated a bond issue with U.S. investors that would, for the first time, be guaranteed by future earnings from Mexican oil exports.[5] Also in May 1993, Mexico issued regulations that liberalized foreign investment in electricity-generating facilities.

Internal demand for lower-cost and more reliable energy supplies, public concern with PEMEX mismanagement, growing environmental problems, and difficulties in raising capital to finance future development are all adding pressure on the Mexican government to liberalize energy trade.

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4. *The Oil Daily* (April 27, 1993), p. 4.

5. *The Oil Daily* (May 27, 1993), p. 5.

BACKGROUND ON U.S. AND MEXICAN ENERGY INDUSTRIES

Total U.S. production of fossil fuels in 1992 (including crude oil, natural gas, and coal) was valued at $97 billion.[6] Of this total, $76 billion was for crude oil and marketed natural gas (see Table 1). Significant value is also added in the refining of petroleum products (such as gasoline), the production of petroleum-based chemicals (or petrochemicals), and the generation of electricity. In 1992, the wholesale value of U.S. shipments of petroleum and coal-based products alone was $158 billion.[7]

Although production of fossil energy is not as labor-intensive as other industries, it accounts for a large share of employment and is the dominant employer in some regions of the United States. Employment in the mining sector includes workers producing oil, natural gas, and coal and those providing services in oil and gas fields. Additional fossil energy jobs exist in the manufacturing sector for those employed by refineries and gas plants. Total employment in the mining sector in 1992 was 635,000.[8] About 400,000 of those jobs were related to producing oil and gas and to providing oil and gas field services. Another 155,000 people worked in petroleum refining.

Compared with imports of other major industries, energy imports represent a large share of the nation's total energy supply, especially for crude oil and petroleum products. Net imports of crude oil and petroleum products accounted for about 40 percent of the total volume of domestic consumption of petroleum in 1992.[9] Mexico was the United States' fourth largest source of imported oil in that year (after Saudi Arabia, Venezuela, and Canada). The United States exports a small amount of natural gas to Mexico, accounting for less than 0.5 percent of total U.S. gas use in 1992.[10]

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6. Energy Information Administration, *Annual Energy Review 1992*, DOE/EIA-0384 (1993), Table 3.2.

7. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business* (March 1993), Table S-2.

8. Department of Labor, Bureau of Labor Statistics, *Monthly Labor Review* (April 1993), Table 12.

9. Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035 (April 1993), Table 1.8.

10. Energy Information Administration, *Natural Gas Monthly* (March 1993), Table 6.

TABLE 1. U.S. SHIPMENTS AND TRADE BALANCE IN OIL AND NATURAL GAS, 1987-1992 (In billions of dollars)

	1987	1988	1989	1990	1991	1992
U.S. Shipments	76.0	67.8	74.6	85.9	75.2	76.4
Trade Balance						
World	-42.0	-39.5	-49.0	-60.4	-50.3	-49.9
Canada	-6.1	-6.4	-6.5	-8.6	-9.6	-9.9
Mexico	-3.4	-2.9	-3.7	-4.6	-4.0	-3.5

SOURCE: Congressional Budget Office using data from the Bureau of the Census, Department of Commerce Trade Policy Information System; and Energy Information Administration, *Annual Energy Review 1992*, DOE/EIA-0384 (1993), Table 3.2.

NOTE: U.S. shipments reflect the wellhead value of crude oil and natural gas production. Imports, exports, and the trade balance reflect totals for crude oil, natural gas, and refined petroleum products from Standard Industrial Classifications 131, 132, 291, 295, and 299, as reported by the Department of Commerce. The values given for imports are landed-duty values, which include the foreign purchase price plus all costs incurred in shipping them to the United States, including U.S. tariffs. The values given for exports are FAS (free alongside ship) values, which are the purchase price plus the cost of transporting them to the port of export in the United States. Because of the change in classification systems used for collecting trade data--from the old Tariff System of the United States Annotated to the new Harmonized Tariff Schedule--trade data for 1987 and 1988 may not be strictly comparable with those for 1989 through 1992.

Mexico produces about a fourth as much crude oil as the United States, but only about 5 percent as much natural gas and virtually no coal. Mexico currently produces 2.7 million barrels of crude oil per day.[11] Mexico exports about half of its crude oil and imports relatively small amounts of petroleum products, natural gas, and energy-related products. In 1992, the U.S. trade deficit in oil and gas with Mexico was $3.5 billion, or about 7 percent of the nation's total trade deficit in energy. In that year, U.S. exports of petroleum products and natural gas to Mexico were valued at $1.2 billion (see Table 2); petrochemicals at $0.4 billion; oil and gas field equipment and parts at $0.2 billion; and electricity-generating equipment at $0.2 billion.

11. Energy Information Administration, *International Energy Annual 1991*, DOE/EIA-0219 (1991), Table ES1 (for comparison of oil, gas, and coal production); and Energy Information Administration, *Monthly Energy Review*, Table 10.1b (for Mexican crude oil production).

TABLE 2. VALUE OF U.S. OIL AND NATURAL GAS EXPORTS AND IMPORTS, 1987-1992

	1987	1988	1989	1990	1991	1992
U.S. Exports						
In Billions of Dollars						
World	4.6	4.4	5.5	7.4	7.7	7.1
Canada	0.7	0.6	0.8	1.2	0.9	0.8
Mexico	0.5	0.4	0.7	0.8	0.8	1.2
As a Percentage of World Exports						
Canada	14.9	13.6	14.4	16.7	11.3	11.4
Mexico	11.1	10.0	12.2	10.5	11.0	17.5
U.S. Imports						
In Billions of Dollars						
World	46.6	43.9	54.5	67.8	58.0	57.0
Canada	6.8	7.0	7.3	9.8	10.5	10.7
Mexico	3.9	3.3	4.4	5.4	4.8	4.8
As a Percentage of World Imports						
Canada	14.5	15.8	13.4	14.5	18.0	18.8
Mexico	8.4	7.6	8.0	8.0	8.4	8.4

SOURCE: Congressional Budget Office using data from the Bureau of the Census, Department of Commerce Trade Policy Information System.

NOTE: Imports, exports, and the trade balance reflect totals for crude oil, natural gas, and refined petroleum products from Standard Industrial Classifications 131, 132, 291, 295, and 299, as reported by the Department of Commerce. The values given for imports are landed-duty values, which include the foreign purchase price plus all costs incurred in shipping them to the United States, including U.S. tariffs. The values given for exports are FAS (free alongside ship) values, which are the purchase price plus the cost of transporting them to the port of export in the United States. Because of the change in classification systems used for collecting trade data--from the old Tariff System of the United States Annotated to the new Harmonized Tariff Schedule--trade data for 1987 and 1988 may not be strictly comparable with those for 1989 through 1992.

LITTLE CHANGE IN ACCESS TO MEXICAN ENERGY RESOURCES

Under NAFTA, Mexico would continue to reserve control of its energy sector through two state energy monopolies--Petroleos Mexicanos for oil and gas and Comision Federal de Electricidad (CFE) for electricity. Restrictions would still apply to crude oil, natural gas, basic petrochemicals, most refined petroleum products, electricity, and uranium. Mexico restricts foreign trade in these commodities through the granting of import and export licenses. Restrictions on foreign participation extend to exploration, production, processing, transportation, storage, and distribution--including generation and transmission of electricity. The restriction on distribution would also apply to investment in retail outlets for refined petroleum products (for example, gasoline retailing).

Moreover, if Mexico decides to restrict its production of energy, neither the United States nor Canada would gain any preferential access to that reduced supply. Mexico also reserves the right to sell energy to its domestic market at a lower price than it sells to the United States or Canada. Because Mexico has not given most-favored-nation status to those countries for its crude oil exports, Mexican oil (unlike Canadian oil) could be subject to any oil import fees the United States might choose to impose in the future.

Thus, the United States should not expect to buy more or receive a lower price for oil from Mexico as a result of NAFTA. Within these very tight restrictions, however, a limited number of opportunities would be created to sell energy and energy-related products to Mexico. Of particular note are investment opportunities related to secondary petrochemicals and electricity generation, and export opportunities for natural gas, basic petrochemicals, services and equipment for oil and gas fields, coal, and road surfacing materials.

TARIFF REDUCTIONS: A SMALL PART OF THE ENERGY STORY

NAFTA would provide for the gradual elimination of all tariffs on goods qualifying as North American under its rules of origin.[12] This provision would include tariff reductions on energy and energy-related goods. The benefits of those reductions to U.S. importers and exporters, however, would not be great.

12. Rules of origin are an important part of NAFTA because they determine whether goods traded among the United States, Canada, and Mexico may qualify for preferential treatment under the agreement. Chapter 4 of NAFTA defines the rules of origin. For the most part, bulk commodities such as oil and natural gas must be of 100 percent North American origin. Imports from non-NAFTA countries must be processed significantly, or substantial value must be added in North America, before the goods into which they are incorporated may qualify for preferential treatment. As an example, petroleum products refined in the United States from Nigerian crude oil would most likely qualify as North American.

The United States currently places little restriction on energy imports from Mexico.

For example, the U.S. tariff on crude oil from Mexico is already very small--only 5.25 cents per barrel for most oil purchased from Mexico, or about 0.3 percent of the average cost of that oil in 1992. And liquefied petroleum gases (such as propane), which account for the biggest share of U.S. imports of petroleum products from Mexico, already enter duty free.

For U.S. goods moving south, the reductions in Mexican tariffs that would most benefit U.S. exporters of energy and energy-related commodities would come about only slowly--after 5 or 10 years. Mexico's 10 percent tariff on natural gas would not be eliminated for 10 years (see Table 3). Mexico's tariffs of 10 percent to 15 percent on the most important categories of equipment for oil and gas fields (including rotary drilling machinery, rock-drilling tools, and well casings) would also not be eliminated for 10 years. Only tariffs for selected petroleum products and a couple of high-technology categories of oil and gas production equipment that Mexico already has difficulty supplying indigenously would be eliminated immediately. Petroleum products that would benefit immediately include gasoline, heating oil, and several secondary petrochemicals. The 10 percent tariff on coal would also be eliminated immediately.

Any progress on tariff reduction would normally promote trade, but exports to Mexico have been more constrained by nontariff barriers. These additional barriers include quantitative limits on commodity imports and exports, differential pricing of domestic and exported goods, restrictions on foreign access to government procurement, and restrictions on foreign investment.

Under NAFTA, Mexico would explicitly maintain its rights to limit energy exports without granting the United States or Canada any preferential access to that reduced supply. Mexico would also retain its rights to price energy exports above the domestic level. As a consequence, Mexican oil exports would remain at whatever level PEMEX and the Mexican government decide. (The United States and Canada would restrict their rights to limit energy exports or differentially tax energy imports to circumstances needed to conserve exhaustible resources, deal with shortages, or stabilize general prices. But they would share any reduced supply.)

TABLE 3. MEXICAN TARIFFS FOR ENERGY AND ENERGY-RELATED COMMODITIES AND THE PROPOSED SCHEDULE FOR PHASING THEM OUT

Commodity	Tariff (Percent)	Phaseout (Years)
Energy Commodities		
Natural Gas	10	10
Electricity	10	5
Coal	10	0
Motor Gasoline	0	0
Distillate and Residual Fuel Oil	0	0
Selected Basic Petrochemicals		
Propane (Liquefied)	10	10
Butane (Liquefied)	0	0
Selected Secondary Petrochemicals		
Propylene, butylene, ethylene, butadiene	10	0
Benzene, toluene, xylene	10	0
Oil and Gas Field Equipment and Parts		
Rotary Boring Machinery for Oil and Gas Field Drilling	10 to 15	10
Parts for Oil and Gas Field Machinery	10	5
Rock-Drilling Tools	15	10
Casing for Oil and Gas Drilling	10 to 15	10
Pipe for Oil and Gas Lines	10 to 15	10
Oil and Gas Separation Equipment	15	5
Geological and Geophysical Equipment	10 to 20	0

SOURCE: Congressional Budget Office using information from the North American Free Trade Agreement.

PROGRESS ON NONTARIFF BARRIERS TO TRADE

Despite Mexico's continued adherence to important restrictions on energy trade, NAFTA addresses other nontariff barriers to create new trade opportunities with Mexico. This section reviews the opportunities that the agreement offers with Mexico in the areas of energy and petrochemical investments, energy and petrochemical exports, and exports of energy-related goods and services. The review makes specific note of the strengths and weaknesses of the respective enforcement provisions.

Investment in Secondary Petrochemicals

Mexico would retain investment restrictions on almost all refined petroleum products, including nine of the most basic petrochemical feedstocks and blending components for gasoline. But NAFTA would specifically allow unrestricted U.S. and Canadian investment for the first time in the production, distribution, and foreign trade of a long list of secondary petrochemicals and a very short list of petroleum products used for nonenergy purposes (such as asphalt).

Before NAFTA, Mexican law made distinctions among three groups of petrochemicals: basic, in which no foreign investment was allowed; secondary, in which a maximum of 40 percent foreign ownership was allowed; and tertiary, in which foreign equity was unrestricted. NAFTA would continue the practice of disallowing foreign investment in basic petrochemicals but would move more than half of the previous number of these restricted petrochemicals to the secondary group. It would also remove restrictions on U.S. and Canadian investment in secondary petrochemicals, effectively ending the distinction between secondary and tertiary petrochemicals. Mexico issued regulations in August 1992 that officially expanded the list of secondary petrochemicals.

The new, unrestricted list of secondary petrochemicals includes all the key aromatics and olefins that are derived from the remaining basic petrochemicals and are the direct input to the production of most finished petrochemicals and plastics, including polyesters, molded plastics, polystyrene, and synthetic rubber. Total U.S. exports in 1992 of the chemicals NAFTA defines as secondary were valued at $263 million (see Table 4).

The potential advantages of investing in petrochemicals in Mexico come not from NAFTA but from the inefficiencies of Mexico's current operations for refining crude oil and processing natural gas, inefficiencies in hauling crude oil (from Mexico) and finished product (from the United States) across the Gulf of

TABLE 4. VALUE OF U.S. PETROCHEMICAL EXPORTS TO MEXICO, 1987-1992 (In millions of dollars)

	1987	1988	1989	1990	1991	1992
Basic	6	9	94	124	86	135
Secondary	165	202	220	199	219	263
Total	171	211	314	323	305	398

SOURCE: Congressional Budget Office using data from the Bureau of the Census, Department of Commerce Trade Policy Information System.

Mexico, and difficulties in situating new petrochemical facilities in the United States and Canada.

U.S. and Canadian businesses might take this new opportunity to expand their exports of secondary petrochemicals to Mexico. Or they might take advantage of the new investment climate to build plants for producing secondary petrochemicals in Mexico--either for sale in Mexico or export to the world market. Either way, U.S. exports of certain finished chemicals and plastics to Mexico would probably grow more slowly than they would without NAFTA.

Two key uncertainties could weaken the investment option. The first concern is how PEMEX, as the principal source of feedstocks, would give access to and price the feedstocks needed to produce the secondary petrochemicals. For example, a 1991 report by the General Accounting Office noted that a shortage of basic petrochemicals was already restricting foreign investment in this area.[13] This concern may be lessened by another provision of NAFTA that would allow U.S. and Canadian suppliers of basic petrochemicals to contract directly with end users in Mexico (discussed further below). To the extent that some of the by-products of the new petrochemical plants would be petroleum products that remained on the restricted list, a related problem might be the price that PEMEX, as the likely sole purchaser, would pay for those by-products.

13. General Accounting Office, *U.S.-Mexico Energy: The U.S. Reaction to Recent Reforms in Mexico's Petrochemical Industry*, GAO/NSIAD-91-212 (May 1991).

The second concern is whether Mexico's commitment to national treatment for new foreign investments--that is, giving them the same treatment as domestic investments--is enforceable. NAFTA would establish a binding arbitration process for investment disputes concerning national treatment, including anticompetitive practices by Mexico's state monopolies. But the agreement states that no party may have legal recourse to settle the dispute unless the anticompetitive practice discriminates against foreign-owned businesses. And if the investment entails the acquisition of a Mexican business, Mexico's National Commission on Foreign Investment reserves the right to reject the acquisition without such recourse. NAFTA would only establish a Working Group on Trade and Competition to report on issues concerning laws and policies on competition.

Adding to the uncertainties surrounding Mexico's intentions are some ambiguities about what products would actually remain on the restricted list of basic petrochemicals and refined products. For example, the published NAFTA document states that petroleum ethers are a restricted petroleum product and that rubber oil extenders are a restricted petrochemical. However, a U.S. firm, Valero Energy Corporation, has recently received permission to build and own a plant for producing the petroleum ether MTBE, an important gasoline additive for increasing octane and reducing vehicle emissions of carbon monoxide. And communications with the Mexican government subsequent to the release of the agreement no longer define rubber oil extenders as basic petrochemicals.

At the same time, the Valero agreement demonstrates a willingness on the part of PEMEX to supply U.S. firms with feedstocks and purchase their output at prices that guarantee profitability, at least in cases where the investment fits in with national objectives--in this case cleaner gasoline. In particular, the Valero agreement indicates that one area in which U.S. firms may maintain a competitive edge--even against indigenous monopolies--is in the supply of environmental technologies.

Investment in Electricity-Generating Facilities

NAFTA presents a second important investment opportunity in Mexico in the area of electricity production. The agreement would allow private investment in facilities that produce electricity for their own use and want to sell their excess supplies, that produce marketable electricity using heat or steam generated by unrelated industrial processes, or that independently produce marketable electricity. The agreement requires that Comision Federal de Electricidad be the sole purchaser of this electricity unless it is to be sold to utilities in the United States or Canada, in which case CFE must be a party to the negotiation.

The economic advantages of this opportunity come from the fast-growing market for electricity along Mexico's northern border, from the value of improving overall system reliability by better integrating the cycles of generation and use on both sides of the border, and from the unused heat potential of existing and future industrial activities in Mexico. The opportunity to produce and sell excess electricity may make other types of industrial investments in Mexico more attractive as well.

As with investments in petrochemicals, potential drawbacks to investments in electricity include the ability to strike and maintain a good deal with CFE for electricity sales and to receive national treatment. CFE is likely to support these investments, however, because Mexico does not otherwise command sufficient resources to service its growing needs for electricity.

In advance of NAFTA's ratification, Mexico has already passed laws (in December 1992) and issued regulations (in May 1993) that implement the changes in the electricity sector proposed in NAFTA. This new investment opportunity is available to all foreign investors. Thus, one incremental benefit of NAFTA's passage at this point may come simply from assuring that those laws are not reversed or diluted in the future--at least as they apply to the United States and Canada. A second benefit would be that NAFTA's assurances of national treatment for new foreign investments in the electricity sector would apply only to U.S. and Canadian investors.

Although direct U.S. and Canadian investors and suppliers of natural gas might benefit from this opportunity, that benefit need not extend to North American manufacturers of electrical equipment. Changes in tariff schedules would benefit domestic manufacturers and construction businesses, but the electrical equipment industry is very competitive worldwide, and suppliers from Asia would probably get a part of any new business in this area. U.S. sales to Mexico in 1992 of selected equipment used to generate and distribute electricity totaled $204 million (see Table 5).

Exports of Natural Gas and Basic Petrochemicals

Mexico retains exclusive rights to foreign trade, production, transportation, and distribution of natural gas and basic petrochemicals (along with crude oil and most refined products). But NAFTA would allow U.S. and Canadian exporters of natural gas and basic petrochemicals to negotiate directly with potential end users in Mexico, with PEMEX as a third party to the negotiation. In effect, PEMEX would probably be the direct purchaser of the gas or petrochemical, reselling it to the end user.

Exports of Natural Gas. This arrangement for natural gas sales, reflecting the necessity of dealing with PEMEX as the owner of the only gas distribution network in Mexico, might dampen new demand for gas--particularly if PEMEX did not allow construction of dedicated gas lines from the United States. Large industrial users of gas (including potential investors in new electricity capacity) need to secure dedicated, reliable supplies of gas. But the reliability of the PEMEX distribution network is at best unproved. End users would also be suspicious of delivery charges set by PEMEX, which might wish to protect its market for fuel oil from imported natural gas.

The fact remains, however, that PEMEX cannot meet Mexico's near-term demands for energy with domestic supplies of natural gas or fuel oil. Production of Mexican gas will remain limited because PEMEX cannot afford to spend more in developing its gas resources or extending its gas pipelines northward (and is not seeking foreign investors for that purpose). Also, plans for the use of current gas production will continue to focus on producing petrochemical feedstocks and on replacing fuel oil used in the polluted central part of Mexico.

NAFTA might greatly facilitate the supply of gas to the fast-growing industrial base in northern Mexico. This new marketing opportunity for gas also complements the opportunity for investments in electricity, since many new

TABLE 5. VALUE OF U.S. EXPORTS OF SELECTED ELECTRICITY-GENERATING EQUIPMENT TO MEXICO, 1987-1992
(In millions of dollars)

	1987	1988	1989	1990	1991	1992
Turbines and Parts	55	72	53	62	38	34
Transformers and Parts	39	56	93	76	107	113
Switchgear/Switchboard Apparatus and Parts	39	63	44	61	51	57
Total	133	191	190	199	196	204

SOURCE: Congressional Budget Office using data from the Bureau of the Census, Department of Commerce Trade Policy Information System.

generating facilities would most likely find natural gas cheaper than PEMEX-supplied fuel oil.

The United States may not be able to claim all of any new Mexican market for natural gas. Underscoring this point, Canada, in the fall of 1992, demonstrated an ability to compete with U.S. suppliers by making its first-ever delivery of gas to Mexico. Canadian exports to Mexico would most likely occur as gas produced in Canada moved into the U.S. pipeline network and made gas produced in the United States available for movement into Mexico--as was the case in the recent Canadian sale. In general, increased U.S. exports to Mexico (from southwestern states) would probably lead to increased U.S. gas imports from Canada (for sale into western and northeastern states); thus, the net gas imports of the United States might not change much as a result of NAFTA.

The relative economics of gas are currently enhanced not only by depressed gas prices in North America but also by the high sulfur content of Mexican fuel oil and Mexico's new concern with air quality. Extensive investment in new refining capacity to reduce the sulfur content of Mexican fuel oil could alter the outlook for sales of natural gas. Nothing in NAFTA, however, would remove restrictions on U.S. investment in that needed capacity.

Adding some uncertainty to the outlook for gas, Mexico may decide (unrelated to NAFTA) to enter long-term contractual arrangements allowing U.S. firms to build and operate plants that would circumvent its constitutional restrictions on foreign ownership. For example, a U.S.-owned facility could charge PEMEX a set processing fee for producing refined products for PEMEX from PEMEX-owned crude oil. This type of arrangement could protect investments and returns on investment without Mexico's yielding title to its refining capacity or oil products. Further potential challenges to the outlook for gas might arise from the prospect of increased coal sales to Mexico (discussed further on page 17).

Economic growth along the U.S.-Mexican border has recently fueled a dramatic growth in U.S. gas exports to Mexico, from 2 billion cubic feet in 1988 to 91 billion cubic feet in 1992 (or about 0.5 percent of total U.S. gas use in 1992).[14] Pipeline exports of gas to Mexico in 1992 were worth $165 million (see Table 6). Total U.S. gas sales to Mexico, however, will be limited by the size of the northern Mexican economy, which, though growing at about 6 percent annually, will still not be very large at the end of the decade. Accordingly, any

14. Gas exports to Canada have also increased despite growing net imports from Canada. Deregulation in the U.S. gas industry since 1985 and the increasing flexibility of natural gas marketers in tailoring contracts to consumer requirements may explain some of the growth in U.S. sales to these countries. The source for natural gas trade data is the Energy Information Administration, *Natural Gas Monthly* (March 1993), Table 6.

TABLE 6. VALUE OF U.S. NATURAL GAS EXPORTS TO MEXICO, 1987-1992 (In millions of dollars)

	1987	1988	1989	1990	1991	1992
Pipeline Gas	7	7	36	29	106	165

SOURCE: Congressional Budget Office using data from Energy Information Administration, *Natural Gas Monthly* (March 1993), Table 6.

further multifold increases in U.S. gas exports to Mexico are not likely. And very early in the next century, as gas prices in the United States and Canada rise and as Mexico develops more of its own gas resources, Mexico could even become a net exporter to those countries--although nothing in NAFTA promotes that end.[15]

Exports of Basic Petrochemicals. U.S. and Canadian exports of basic petrochemicals may also benefit from NAFTA, subject to PEMEX's willingness to allow competitive sales to Mexican end users. Mexico is currently a net importer of basic and secondary petrochemicals, a position made necessary in part by the nation's inability to develop fully its natural gas resources. In 1991, U.S. exports to Mexico of the petrochemicals that NAFTA defines as basic were valued at $86 million (see Table 4 on page 11).

Any increase in exports of basic petrochemicals would probably be for nonfeedstock uses--particularly propane for agricultural uses such as drying crops and for rural heating. Some of the increased exports of basic petrochemicals could support increased Mexican production of secondary petrochemicals, but those basic petrochemicals would probably have greater value as feedstocks in the north, where U.S. and Canadian petrochemical manufacturers would retain a significant cost advantage.

In general, any increase in North American trade and investment in petrochemicals would increase the efficiency of North American refining and petrochemicals operations by better balancing production and consumption of the

15. The Energy Information Administration projects that Mexico will become a net exporter of gas by 2010. See its publication *Annual Energy Outlook 1993*, DOE/EIA-0383 (1993).

many jointly produced petroleum products. Increased efficiency would lower production costs and enhance the competitiveness of U.S. producers in European and Asian markets.

Export Opportunities for Other Energy Products

NAFTA would allow participation and investment in the markets for a very short list of petroleum products (paraffin, lubricants, and road-surfacing materials) and for coal. This provision would apply to foreign trade, production, distribution, and marketing of these products. For example, as Mexico increasingly addresses its infrastructure needs, NAFTA might facilitate the development of new U.S. markets for asphalt and road oils.

Mexican coal use, almost all supplied by domestic sources, is very low--accounting for less than 2 percent of the nation's total energy use. If priced low enough, however, coal delivered by rail from the southwestern United States could compete with natural gas exports to the new industrial and electricity-generating markets of the north. Mexico's federal electricity commission, CFE, could also find coal shipped by sea more economical than domestic gas or residual fuel oil for new generating plants in the central part of the country. And if CFE added any new coal-fired capacity, NAFTA would at least give U.S. coal suppliers an advantage over their potential competitors from South America and Australia. NAFTA could give U.S. coal exports a significant boost not only by allowing fuller access to the Mexican market but also by immediately eliminating Mexico's 10 percent tariff on North American coal and by easing restrictions on cross-border rail traffic.

Although perhaps insignificant in terms of total new trade, these provisions constitute further inroads into Mexico's previous unwillingness to allow foreign investment in energy.

Providing Energy-Related Goods and Services

A final area in which NAFTA could promote U.S. energy-related exports is in contracting with Mexico's state energy monopolies to provide goods and services, including construction services. First, Mexico would immediately open a maximum of 50 percent of the large procurement contracts with PEMEX and CFE to U.S. and Canadian businesses, increasing to 100 percent by 2003.

Second, NAFTA includes a major rewriting of the government procurement process, designed to ensure that U.S. and Canadian contract bids receive fair

consideration. This revision makes an important contribution to building Mexico's legal infrastructure and, as such, is one of the most important parts of NAFTA.

And third, in a token exception to its prohibition on foreign ownership of energy resources, Mexico would allow contracts for oil and gas drilling services to include performance clauses. In the absence of such incentives, many U.S. firms consider Mexico's current contract requirements for drilling services to be prohibitive--especially requirements for fixed-price bidding on tasks for which the contractor not only would have incomplete information on the overall project but also could not control the entire project, the timing, or, as a result, the costs. Under the most optimistic interpretation of this mention of performance clauses, drilling contractors could earn compensation based in part on how much oil or gas was found--a more common practice in other oil markets. Such performance clauses based on discovery are especially important for smaller contractors because the contracts represent marketable assets that firms can use in securing needed project financing.

As with other opportunities presented by NAFTA, the real gains here are at best uncertain. Nothing in the agreement would require PEMEX to offer performance incentives in its drilling contracts. And Mexico would probably be unwilling to tie such incentives to the amount of oil or gas found, restricting them instead to rewards for early or below-budget completion.

Similarly, nothing in the agreement would require Mexico to direct any minimum share of procurement business to U.S. and Canadian firms. The agreement applies only to procurement actions by government enterprises (PEMEX and CFE) for goods and nonconstruction services worth more than $250,000 and for construction services worth more than $8 million--not counting projects funded by international organizations. (Separate, lower dollar thresholds apply for contracts with other government entities.)

Most important, NAFTA does not apply to procurement with values below the dollar thresholds set in the agreement. And Mexico could easily circumvent the dollar thresholds in order to place even larger procurement actions outside the agreement. For example, the dollar thresholds would encompass the total costs for drilling most on- and offshore wells. But the separable costs for many individual drilling services (equipment, logging services, drilling fluids) and services related to oil and gas wells (well completions, workovers, pump maintenance) would be below the thresholds, especially for onshore wells. Similarly, Mexico's state monopolies could easily structure contracts for construction services to parcel out work in increments below the $8 million threshold. Of course, any incentives PEMEX might have for restructuring

contracts would be limited to the extent that separating projects into smaller tasks raised overall project costs.

No estimates of potential new business for U.S. and Canadian service and construction contractors are available, but new business is likely to be much smaller than 50 percent of what Mexico has indicated its current total procurement budget to be. For example, 1991 PEMEX expenditures for goods, services, and public works were reportedly $5.2 billion.[16] That is a huge sum when compared with Mexico's ongoing level of oil and gas drilling and reported construction activity for refinery upgradings, petrochemical and fertilizer plants, natural gas processing plants, and pipelines. But many of these expenditures are for services performed by PEMEX employees. In that case, competitive bidding for these tasks could come about only with a major divestiture of PEMEX functions.

PEMEX does contract with U.S. businesses for the design and construction of refineries and gas processing plants. But services for oil and gas fields, other than the services PEMEX performs, are currently provided almost exclusively by Mexican contractors. Only two foreign firms have been awarded contracts for drilling services since the 1970s, and those were in 1992 and late 1991.[17]

The situation is a little different for U.S. suppliers of oil and gas field equipment (as opposed to services). Sales of this equipment to Mexico were valued at $200 million in 1992 (see Table 7). These exports increased by more than $100 million between 1990 and 1992. Most of the increase, $60 million, was for parts for drilling rigs, production platforms, and machinery. Another $20 million of the increase was for geological and geophysical equipment. The increase is unrelated to NAFTA and mainly reflects Mexico's plans for restoring some excess oil production capacity in the wake of the Persian Gulf War and for developing its natural gas resources. Loan guarantees by the U.S. Export-Import Bank for the purchase by PEMEX of U.S. oil and gas equipment and related services may aid future U.S. exports.

With or without a reorganization of PEMEX functions, the potential procurement market for services and equipment will be arbitrarily capped as long as Mexico adheres to central planning for the development of its energy resources. U.S. oil and gas service firms and equipment suppliers should not be very optimistic about the prospects of significant new work with PEMEX as a result of NAFTA.

16. Personal communication with staff of the Department of Energy's Office of International Analysis.

17. *The Oil Daily* (September 30, 1992), p. 2.

TABLE 7. VALUE OF U.S. EXPORTS OF OIL AND GAS FIELD EQUIPMENT AND PARTS TO MEXICO, 1987-1992 (In millions of dollars)

	1987	1988	1989	1990	1991	1992
Drilling Rigs, Production Platforms, and Oil and Gas Field Machinery	0.7	13.4	2.9	4.5	3.6	6.8
Parts for Drilling Rigs, Production Platforms, and Machinery	52.8	50.9	35.0	43.6	67.4	104.3
Drilling Tools	5.5	5.4	9.6	11.8	14.8	15.5
Casing for Oil and Gas Drilling	2.1	8.1	5.5	7.3	14.7	12.4
Pipe for Oil and Gas Lines	1.0	3.7	4.4	5.4	12.0	7.8
Pumps	1.4	1.7	1.3	1.1	1.3	1.7
Valves	10.7	13.9	10.7	15.5	21.6	28.6
Oil and Gas Separation Equipment	0.3	0.5	13.2	2.9	1.6	1.6
Geological and Geophysical Equipment	2.1	2.4	1.5	1.4	15.9	21.5
Total	76.6	99.9	84.2	93.5	152.9	200.1

SOURCE: Congressional Budget Office using data from the Bureau of the Census, Department of Commerce Trade Policy Information System.

If the development of Mexican resources were left to the market, the growth potential for exports of oil and gas services and field equipment would be tremendous. Mexico currently produces about 2.7 million barrels of crude oil per day from fewer than 5,000 wells. Mexico sustains this production base with about 100 active rotary drilling rigs during most of the year. In contrast, the United States profitably produces about 7.1 million barrels per day from about 600,000 wells, and keeps nearly 1,000 rotary rigs active.[18] In a free market, some low-yield investments in finding and producing oil in the United States plus high-risk investments in other parts of the world could be profitably redirected south of the border. As the world leader in the supply of drilling services and equipment, the United States would capture a large part of any new business in Mexico.

18. *Oil and Gas Journal* (December 28, 1992), p. 72; Energy Information Administration, *International Oil and Gas Exploration and Development*, DOE/EIA-0523 90/4Q (September 1991).

CHANGES IN THE ENERGY AGREEMENT WITH CANADA

The energy agreement with Canada generally supports the principle of free trade, although it recognizes several limitations imposed by national security interests in this area. NAFTA includes many of the same provisions for energy trade with Canada that are included in the Canada-United States Free Trade Agreement. CFTA did not allow dual pricing of energy for domestic versus export markets. It also prohibited setting minimum prices for exports or imports, except for purposes of conservation, price stabilization, and national security. Canada agreed, however, to guarantee the United States proportional access to Canadian oil and gas exports in the event it placed any restrictions on its supplies.

Among other provisions carried over from CFTA, the U.S. and Canadian governments may continue to provide incentives for domestic energy exploration and production. The United States agreed to allow up to 50,000 barrels per day of Alaskan oil exports to Canada. The United States agreed to remove regulatory impediments to electricity trade in the northwestern United States. And CFTA addresses, but leaves unclear, the authority for resolving disputes related to differences between the two nations in the rate structures for gas pipelines and to the overlapping jurisdictions of federal and local regulators in the United States.

The current ambiguity on gas pricing has presented problems. For example, rulings by the U.S. Federal Energy Regulatory Commission on how Canadian gas should be priced at the border had the effect of raising the delivered cost of that gas to U.S. consumers. Also, the California Public Utility Commission (CPUC) has objected to long-term contracts negotiated between Alberta suppliers and California distributors; CPUC prefers that gas be priced at lower, spot rates. (The Alberta-CPUC controversy is further complicated by the fact that the sole pipeline carrying Alberta's gas to Northern California is owned by Pacific Gas & Electric, California's largest gas distributor.) NAFTA addresses these problems once again by specifically requiring national treatment with regard to energy regulatory measures and by directing regulatory bodies to avoid disruption of contractual relationships. Whether or not this language will resolve the disputes remains to be seen.

NAFTA does not remove all remaining obstacles to energy investment in Canada. CFTA leaves the door open for new, potentially restrictive performance requirements on future U.S. investments in Canada. Canada took the opportunity offered by NAFTA to insert language describing specific performance requirements on several very large investments. For example, Canada specifies requirements for local content and technology transfer for foreign investments in the Hibernia project, a potential $4.4 billion oil development in Newfoundland.

The agreement specifies additional requirements for investments in Nova Scotia, the Yukon, and the Northwest Territories.

Further obstacles to free trade come from Canada's continued adherence to restrictions on the overall type and size of U.S. investments in energy. Under the Investment Canada Act, Canada reserves the right to review and approve all U.S. acquisitions worth more than $150 million. Decisions by Investment Canada--the government-appointed board that reviews acquisitions--would not be subject to the provisions in NAFTA for settling disputes.

The overall direction of Canadian investment policy, however, is still positive. For example, the Investment Canada Act, although it restricts total foreign investment, favors U.S. investors to the extent that the threshold for non-U.S. investments is much lower--$5 million for direct investments and $50 million for nondirect. U.S. investors also will benefit from Canada's abandonment of the federal policy of maintaining at least 50 percent Canadian ownership of upstream businesses, including oil and gas exploration, production, and transportation.