FOREIGN INVESTMENT BARRIERS OR OTHER RESTRICTIONS THAT PREVENT FOREIGN CAPITAL FROM CLAIMING THE BENEFITS OF FOREIGN GOVERNMENT PROGRAMS

Report to the United States Trade Representative and the Congress on Investigation No. 332-268 under Section 332(g) of the Tariff Act of 1930

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Preface

On January 27, 1989, the U.S. International Trade Commission instituted investigation No. 332-268, Foreign Investment Barriers or Other Restrictions That Prevent Foreign Capital From Claiming the Benefits of Foreign Government Programs. This investigation was instituted following receipt on November 16, 1988, of a request from the U.S. Trade Representative (USTR) made at the direction of the President, under section 332(g) of the Tariff Act of 1930 (19 U.S.C. 1332(g)), for the purposes of identifying countries that maintain investment barriers or other restrictions that effectively prevent foreign capital from claiming the benefits of government programs on the same terms as domestic capital. The letter from USTR requests that the report on this investigation be submitted to the House Committee on Ways and Means, the Senate Committee on Finance, and the USTR within 9 months of the date of the receipt of the letter or by August 16, 1989. The letter also requests that by this date, the Commission make copies of the report available to the public.[1]

The conference report (Report No. 100-576) accompanying the Omnibus Trade and Competitiveness Act of 1988 directs the USTR to ask the U.S. International Trade Commission to conduct a section 332 investigation identifying countries that maintain investment barriers or other investment restrictions. The conference report further directs that the Commission's report should be submitted to the House Ways and Means Committee, the Senate Finance Committee, and the USTR.[2]

Notice of investigation and scheduling of a public hearing were given by posting copies of the notice of investigation at the Office of the Secretary, U.S. International Trade Commission, 500 E Street, SW, Washington, DC, and by publishing the notice in the *Federal Register* (54 *F.R.* 6182, Feb. 8, 1989).[3]

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[1] A copy of the letter of request from the USTR and the Commission's response are reproduced in App. A.
[2] A copy of the pertinent sections of the conference report is reproduced in App. B.
[3] A copy of the Commission's Notice of Investigation as it appeared in the *Federal Register* is reproduced in App. C.

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Executive Summary

The major objectives of this investigation were to-

1. Identify foreign government practices that give local producers a competitive advantage over U.S. producers and determine if U.S. companies investing in these foreign countries can gain *access* to the beneficial foreign practices in the same fashion as local investors;
2. Identify investment barriers or other restrictions that act to keep U.S. firms from investing in the foreign countries and hence unable to take advantage of the beneficial government programs in the same fashion as local investors; and
3. Identify, to the extent possible, the effects of the nonaccess to the preferential foreign government programs on production cost differentials between the foreign and U.S. firms, quantity of trade between the two countries, and the competitiveness of the U.S. energy-intensive industries.

To the extent that a local industry has raw material or other production cost advantages due to a government program, the products of the industry obtain an advantage in world markets. For example, an industry using low-cost petroleum or natural gas as a raw material, such as the petrochemical industry, could potentially be highly competitive on the world market. Similarly, energy-intensive products, such as cement, could also have cost advantages on the world market. This investigation concentrates on natural-resource-rich nations such as Mexico, Canada, the member nations of the Organization of Petroleum Exporting Countries (OPEC), China, and the Soviet Union during the period 1984-88.[1]

Mexico

Beneficial government practices

- The Government of Mexico has maintained a two-tier industrial pricing policy[2] for petroleum products (such as No. 6 fuel oil) and natural gas. Mexico's National Industrial Development Plan (NIDP) states that fossil fuel prices have been lower than international prices to allow for the strengthening of the consuming industry by giving it a "substantial margin of protection via input." An anti-inflationary economic program, which placed a ceiling on domestic prices, has contributed to the difference between domestic and world natural resource pricing since November 1987.

Although prices have been rising, they are still below international levels. For example, in 1988, natural gas prices were $2.89 per thousand cubic feet in the United States versus $2.46 per thousand cubic feet in Mexico; No. 6 fuel oil in the United States was $0.33 per gallon versus S0.18 per gallon in Mexico. During fieldwork in Mexico, Petroleos Mexicanos (PEMEX) officials stated that feedstocks, such as natural gas and No. 6 fuel oil, necessary in the production of energy-intensive products, are sold to Mexican companies as well as to joint-venture companies at the same price level.

Investment barriers or other restrictions

- Foreign investment in Mexico is subject to close Government scrutiny and regulation. The rules governing foreign investment are contained in three laws originally enacted during the 1970s the most important of which is the 1973 Law to Promote Mexican Investment and Regulate Foreign Investment. One of the provisions of this law calls for the state to have exclusive rights to explore and develop petroleum, natural gas, and other resources; produce basic petrochemicals, radioactive minerals, nuclear energy, electricity; and operate railroads, telegraphic, and radio communications.

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[1] U.S. International Trade Commission, ***Potential Effects of Foreign Governments' Policies of Pricing Natural Resources,*** (Investigation No. 332-202) identified few formal instances of natural resource pricing policies by foreign governments. However, evidence gathered during the investigation indicated that pricing practices existed in many of the countries that will be covered in this report. In most of these nations, the pricing practices appear to be centered in the national petroleum company.

[2] A two-tier industrial pricing policy refers to a nation's practice or formal policy of pricing natural resource products to domestic industrial users in the country concerned at prices substantially below the export selling price or other market value of the product.

- On May 16, 1989, several regulatory changes were made to the foreign investment laws designed to attract more foreign capital into Mexico. Under the new regulation, investments of up to $100 million will be automatically approved under certain conditions and certain industries that were previously limited in the percentage of foreign investment allowed will be eligible for 100-percent foreign ownership. Prior to this regulation, the Mexican Government preferred that foreign investment be in the form of joint ventures with Mexican companies, with the Mexican partner usually controlling at least 51 percent of the joint venture. Exceptions were granted where authorities considered the investments to be particularly attractive for Mexico, such as those offering technology transfer, significant employment and local content, large export potential, and industrial diversification.

Effects of foreign government practices on U.S. energy-consuming industries

- PEMEX has the sole responsibility for the exploitation and production of Mexico's natural resources as well as the production of refined petroleum products and primary petrochemicals.
- Foreign investment is permitted in the carbon black industry and producers in Mexico enjoy an advantage in terms of low prices for carbon black feedstock (CBFS), a by-product of petroleum refining. Carbon black feedstock is priced at about 50 percent of the international price; however, both Mexican companies and Mexican joint-venture operations with foreign investors receive carbon black feedstock at the same price from PEMEX. It is unlikely that Mexican carbon black exports could undercut the price of U.S. domestic production without the lower-priced CBFS.
- Under the provisions of the May 16, 1989 regulation, 100-percent foreign ownership of cement plants is permitted; however, prior to this legislation, cement production was limited to 49 percent or less foreign ownership. There are currently no U.S. companies holding interest in the Mexican cement industry. Mexico does offer the cement industry a cost advantage in terms of fuel costs of about $0.60 per ton since Mexican No. 6 fuel oil is priced below international levels. Comparing British thermal unit (Btu) values of Mexican heavy fuel oil prices with U.S. bituminous coal prices, the U.S. cement industry estimates that Mexican cement producers enjoy a $6.55 fuel cost advantage per ton of cement produced.
- Prior to the May 16, 1989 regulatory changes which allows 100-percent foreign ownership of float glass facilities, foreign investment in the float glass industry was limited to 49 percent. It has been possible for downstream fabricating facilities to be 100-percent foreign owned if the production was exported. Although PEMEX sells natural gas to the float glass industry, the price of the natural gas has risen to near international levels. Mexico does offer cost advantages to float glass and float glass product manufacturers in terms of energy costs. Since Mexican natural gas prices have risen to near international levels, it is unlikely that a substantial change in the price of Mexican float glass would occur if natural gas prices equaled world prices; however, there is more of a cost advantage associated with plants based on No. 6 fuel oil.
- Foreign investment is permitted in the production of steel in Mexico; however, the level of foreign investment is relatively small. Natural gas prices are the same for domestic as well as foreign investors in the Mexican steel industry; however, the cost savings for natural gas represent a relatively small component affecting Mexican steelmakers' competitiveness. The pricing policy for natural gas has relatively little effect on the allocation of resources in steel in Mexico.

Canada

Beneficial government practices

- Canada does not maintain a two-tier system of pricing natural resources. There is no difference in the pricing of natural resources for domestic versus foreign companies.

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Investment barriers or other restrictions

- Canada's principal goal regarding its natural resource exploitation policy is to maximize the extent of Canadian ownership in these enterprises. Presently, Canadian licensing procedures require that 50-percent Canadian ownership is required before a production license for frontier lands will be issued. This policy has not been altered since 1985, and was "grandfathered" into the provisions of the United States-Canada Free Trade Agreement. Also retained were previously existing policies prohibiting foreign interests from taking over financially healthy Canadian petroleum companies.

Effects of foreign government practices on U.S. energy-consuming industries

- The chemical industries of Canada, which benefit significantly from the availability of abundant reserves of hydrocarbons necessary for production, have significant shares of foreign ownership. There are no indications of foreign investment bathers or preferential natural resource pricing for domestic industries affecting the chemical industries or the manufacture of steel in Canada.

Saudi Arabia3

Beneficial government practices

- The Saudi Government has traditionally offered energy products consumed domestically at below world prices and extends these cost benefits to both national and foreign joint venture companies. According to reports from the U.S. Embassy staff in Saudi Arabia, heavy fuel oil and diesel fuel sold for between 2-3 cents per liter during the first quarter of 1989 compared with equivalent 1988 average U.S. prices of around 13.3 cents per liter for diesel fuel and 8.8 cents per liter for residual fuel oil sold to end-users. Similarly, the Saudi Government makes natural gas available to all industrial sites within the Kingdom at a price of approximately 50 cents per thousand cubic feet compared with the current average U.S. price of around $3.00 per thousand cubic feet. The Saudi Government, however, does not exclude foreign industrial partners from access to these cheaper energy sources.

Investment barriers or other restrictions

- In order to further the industrial development of the Kingdom and reduce the total dependence on crude petroleum exports as a source of foreign income, Saudi Arabia offers foreign investors several Government sponsored benefits. Saudi Arabia welcomes foreign investment in the form of 50-50 joint-venture partnerships. The Government provides loans for up to 50 percent of fixed costs which carry only a nominal 1 to 2 percent annual service fee. In addition, the Saudi Government provides land at nominal rents, duty-free imports of equipment and raw materials, and the Government will pay the full costs of training Saudi employees, including wages. Saudi Arabia imposes no currency exchange control restrictions on repatriation of capital or profits.

Effects of foreign government practices on U.S. energy-consuming industries

- Saudi Arabia maintains no bathers or restrictions to foreign investment in the ethylene, ammonia, and refined petroleum products industries, other than regulations which govern investments in other business sectors. Joint ventures with each partner holding a 50-percent equity share is the normal arrangement with partners sharing access to low-priced feedstocks and other Government programs. Although the feedstock acquisition costs for Saudi producers and their joint-venture partners are reportedly below the equivalent world market costs, transportation costs outside of the markets currently served would be high.

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9 Member of OPEC.

Venezuela[4]

Beneficial government practices

- Venezuela actively promotes its low-cost energy resources. Both foreign joint-venture companies and national firms have access to these low-cost products.

Investment barriers or other restrictions

- To be eligible for reduced tariffs on goods traded between members of the Andean Pact, firms must be no less than 51-percent owned by nationals of a member nation. Additionally, in Venezuela, foreign investment had been restricted by a Government policy which maintained a multi-tiered currency exchange rate structure for the Bolivar (Bs). Foreign investments, except when in an industry where at least 80 percent of the output was exported, was made at a controlled rate of the Bs 14.50 per $1. However, it was recently announced that a single, floating exchange rate for the Bs will be established, abolishing the official rate which was applied to most international commercial and financial transactions.
- Venezuela, along with certain other OPEC nations concerned about not producing crude petroleum at full capacity, visualize investments in U.S. and West European petroleum refineries as an opportunity to generate a captive use for their natural resources. That portion of an OPEC member's crude petroleum production that is used in a joint-venture facility does not count as a portion of OPEC's annual production quota. Venezuela has a planned acquisition target figure of about 700,000 barrels per day of foreign refinery capacity. Venezuela has already acquired joint-venture partnerships with Champlin Refining and Citgo in the United States, with Veba Oel in West Germany, and with Nynas Petroleum in Sweden and Belgium.

Effects of foreign government practices on U.S. energy-consuming industries

- Venezuela considers the natural gas-based petrochemical sector as the second-most-important investment sector for the state energy monopoly, Petroleos de Venezuela (PDV), which has the sole responsibility for exploiting the nation's natural resources. PDV controls the domestic market for natural gas and supplies this natural resource to its own subsidiaries as well as to privately and jointly owned commercial users at the same price. Although the fertilizers, olefins, and refined petroleum products industries have a feedstock price advantage, exports are marketed at prices which are similar to the world prices for these products.

Indonesia[5]

Beneficial government practices

- Indonesia offers low-cost natural gas for domestic production. In a Government decree issued on June 23, 1984, Indonesia's Minister of Mines and Energy established ceiling prices for natural gas consumed by domestic industrial energy consumers. The ceiling calls for a maximum of $2.00 per million Btu's for natural gas used for generating electrical energy and 65 cents per million Btu's for natural gas used as an energy source in the production of steel. Indonesia is striving to substitute natural gas as energy products for crude petroleum and its derivatives.

Investment barriers or other restrictions

- Indonesian law prohibits the distribution of goods and services by other than Indonesian citizens or by companies wholly owned by Indonesian nationals.

[4] Member of OPEC.
[5] Ibid.

However, in an effort to attract increased foreign investment, the Government recently announced that a foreign company will be treated as a domestic company in joint ventures where 51 percent of the shares are owned by Indonesian nationals, or where 45 percent is Indonesian-owned and at least 20 percent of the total stock is sold on the domestic market.This would allow such a company to distribute its own products and make investments in certain other domestic firms.

Effects of foreign government practices on U.S. energy-consuming industries

- Indonesia's ammonia and urea production facilities are solely owned by the Government. Although a detailed cost analyses of the industry is not available, it is known that natural gas is provided as feedstock at below world level prices. Most of the production is consumed domestically or exported to China or other Asian nations. The refining industry is owned and operated by Pertamina, the state energy monopoly. Foreign investment is not permitted in this industry.

Other OPEC nations6

Beneficial government practices

- OPEC plays a major role in determining the world price of crude petroleum. Domestic prices for the crude petroleum and natural gas, however, are generally determined by the individual governments.
- According to one example in 1984, the world price of natural gas was said to "substantially" exceed that of Kuwait's domestic price. In addition, at least two of the nations reportedly provide their hydrocarbon industries with various assistance on inputs ranging from utilities and land to feedstock and fuel.

Investment barriers or other practices

- The crude petroleum, petroleum-refining, and natural gas industries in most of these nations are nationally controlled. Foreign investment in these industries is generally subject to various restrictions. Iraq has stated that it will allow no foreign investment other than that of other Arab countries. It has been speculated, however, that Iraq will consider expanding foreign investment opportunities to generate revenues that could be used to repay debts incurred during its war with Iran. Other countries allow foreign investment, primarily in the form of joint ventures, but regulate the degree of foreign ownership such that the nation's government or state-owned corporation holds the controlling interest in the venture. Depending on the particular nation and industry involved in the joint venture, in some cases, foreign investment partners have access to below world priced-feedstocks and energy resources. Service contracts are often used in these nations because they allow the countries to pursue development while maintaining control over the industry.

Effects of foreign government practices on U.S. energy-consuming industries

- The price of natural gas and petroleum to most of the energy-consuming industries in these nations is transferred at a lower cost than is available on the world market. Foreign investment in these industries is highly regulated.

China

Beneficial government practices

- The State Council instituted price reform in March 1984 on energy commodities; however, China's pricing policy on coal and crude petroleum through 1988 still involved state-imposed prices for production quantities up to

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6 Algeria, Ecuador, Gabon, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, and the United Arab Emirates.

predetermined quota levels. The Chinese Government fears that raising energy prices will lead to price increases throughout the economy. The price of crude petroleum has been fixed since 1950 at about $3.50 to $4.00 per barrel at 1987-88 exchange rates. (This is known as the official price.) The price of coal, up to the quota level, is fixed by the State Planning Commission for the approximately 2,100 mines under the Ministry of Coal Industry's jurisdiction at $11-$12 per metric ton at the mine. Foreign investors in joint ventures utilize natural resources at the lower price available to domestic companies.

- Industry sources report that there is no single official price for natural gas in China; rather, there are different prices determined within the various regions of the nation. The price for natural gas is higher in those regions where supply is short and/or demand is high.

Investment barriers or other restrictions

- China officially opened its borders to foreign investment in 1979 with the Joint Ventures Foreign Investment law. China now has more than 150 laws and regulations applying to foreign investment, covering everything from arbitration to wholly foreign-owned enterprises.
- Although the official policy is to encourage foreign investment, actual conditions are still difficult as reportedly serious obstacles remain to investment. The U.S. Government reports that these obstacles include a complex system of controls which reportedly result in costly and difficult contract negotiations, followed by a lengthy bureaucratic approval process.

Effects of foreign government practices on U.S. energy-consuming industries

- Foreign investment in the petroleum-refining industry is not permitted but is limited to upstream exploration, development, and production of crude petroleum. Most of the crude petroleum obtained by China's refineries is at costs below world market levels. However, China's exports of petroleum products are priced at, or slightly below, international prices.

Soviet Union

Beneficial government practices

- There are two types of natural-resource-pricing in the Soviet Union: one for export and one for the domestic market. The domestic market price is a three-tier system of wholesale, state-procurement, and retail prices. The average nationwide price for crude petroleum has been about $6 per barrel; $0.86 per thousand cubic feet for natural gas; and $25.32 per metric ton for coal.
- The Soviet domestic price system was revised in 1982 and another revision is scheduled to become effective in 1991. The 1982 price revision increased domestic prices, moving them closer to world market prices. The domestic prices for natural resource raw materials will continue to be set centrally and remain stable for a 5-year period.

Investment barriers or other restrictions

- The Soviet Union has taken actions to liberalize the terms under which foreign investment can occur, including equity investment in projects related to natural resources, such as equipment supply and plant modernization. Although crude petroleum and natural gas production as well as the production of refined products in the Soviet Union are reserved for the State, joint ventures are permitted in energy-intensive sectors of the economy, such as petrochemicals. These joint ventures usually require 51-percent ownership by Soviet nationals.

Effects of foreign government practices on U.S. energy-consuming industries

- The ammonia industry in the Soviet Union is under the direction of the Ministry of Fertilizer Production. The ammonia industry receives natural gas at a price below world levels. However, the transportation costs associated with shipping the ammonia to the United States, the largest market for Soviet exports, offsets this advantage somewhat.

Input-Output Analysis

The Commission used input-output analysis to estimate the possible effects of foreign governments' pricing policies for energy resources on the production of energy-intensive industries. Estimates were made of the increased value of total U.S. imports as a result of the lower import prices for these products.

Production costs in Mexico were estimated to be 0.38 percent to 19.25 percent lower than in the United States due to the cost savings resulting from lower priced natural resources used for fuel and feedstock. In particular, the carbon black industry appears to have a large cost advantage due to the large amount of natural resource inputs required per dollar of output. Other industry groups that are also notable include petroleum refining and stone and clay products.

Saudi producers benefit from an 83-percent price advantage for natural gas and a 72-percent price advantage for fuel oil. Production costs were estimated to be between 0.74 percent and 6.03 percent lower due to lower input prices for natural gas and fuel oil. Industries where Saudi producers could have a notable cost advantage include chemical products, petroleum refining, and cement.

Venezuelan producers enjoy a 94-percent price advantage for natural gas and a 91-percent price advantage for fuel oil. The estimated cost advantage ranges from 0.91 percent to 13.49 percent with the chemicals, the petroleum-refining, and the store and clay products industries having the largest benefit due to low natural resource pricing.

Indonesian producers have a 50-percent price advantage for natural gas, but no price advantage for fuel oil. Indonesian producers were estimated to have a small cost advantage in these industries ranging from 0.16 percent to 1.69 percent.

Chapter 1

Introduction

General

The major objectives of this investigation are (1) to identify foreign government practices that give local producers a competitive advantage over U.S. producers and determine if U.S. companies investing in these foreign countries can access the beneficial foreign practices in the same fashion as local investors; (2) identify investment barriers or other restrictions which act to keep U.S. firms from investing in the foreign countries and hence unable to take advantage of the beneficial government programs; and (3) identify, to the extent possible, the effects of nonaccess to the preferential foreign government programs on production cost differentials between the foreign and U.S. firms, quantity of trade between the two countries, and the impact of nonaccess on the competitiveness of the U.S. energy intensive industries.

In referring to the need for the U.S. International Trade Commission study, Chairman Gibbons of the Subcommittee on Trade of the House Committee on Ways and Means made the following statement: "the situation giving rise to this conference report language is Mexico's investment regime as it applies to foreign access to Mexican natural resources. Mexico maintains a dual pricing scheme for its natural resources whereby the export price is above the domestic price for those resources. In this setting, investment restrictions reserve for Mexican capital the full advantage conferred by the lower domestic price of Mexican natural resources." Senator Dole elaborated further, "The focus...should be on those foreign investment barriers which combine with a foreign government program to place American companies at a competitive disadvantage because they cannot get access to the natural resources on the same terms and conditions as entities of that foreign country. "[2]

To the extent that a local industry has raw material or other production cost advantages due to a government program, the products of the industry obtain an advantage in world markets. For example, an industry using low-cost petroleum or natural gas as a raw material, such as the petrochemical industry, could potentially be highly price competitive on the world market. Similarly, energy-intensive products, such as cement, could also have price advantages on the world market. —

[1] 134, *Congressional Record,* July 13, 1988, p. H5522.
[2] 134, *Congressional Record,* Aug. 3, 1988, p. 510720.

Scope of the Investigation

In May 1985, the Commission published the final report on investigation No. 332-202, ***Potential Effects of Foreign Governments' Policies of Pricing Natural Resources.*** This study identified few formal instances of natural-resource-pricing policies by foreign governments. However, evidence accumulated during the investigation indicated that although formal policies were not identified, informal pricing practices existed in many of the natural-resource-rich nations, particularly for crude petroleum and natural gas. In most of the crude petroleum- and natural-gas-rich-nations, the pricing practices appear to be centered in the national petroleum company. Although the responsibilities of these national companies differ among nations, most of the companies also have authority extending to petrochemicals, liquefied petroleum gas, and marine transportation.

As in the previous Commission investigation and in accordance with the intent of the Conference Report, this report will concentrate on natural-resource-rich nations such as Mexico, the OPEC members, Canada, the Soviet Union, and China for the period 1984-88, with reference to significant changes since 1989. The investment policies in other selected nations with significant reserves of natural resources are discussed briefly in appendix D. The Commission, in its notice of investigation, requested comments from the public with information identifying programs and investment barriers of all types, including those related to natural resource access and pricing.

Background

World reserves and production

A principal factor associated with industrial development in any nation is the availability and associated pricing structure of the natural resources. Nations other than the United States that have been associated with an abundance of such natural resources include Mexico (with its reserves of crude petroleum and natural gas); Canada (natural gas); the member nations of OPEC, particularly Saudi Arabia, Indonesia, and Venezuela; and the nonmarket economies of the Soviet Union and China. These nations will be discussed individually in this report because of their large reserves and production of crude petroleum and natural gas (see tables 1-1 and 1-2).

Overall, estimates of world crude petroleum reserves increased by more than 2 percent during 1988, after having increased by 27 percent during 1987. OPEC-member nations accounted for 75 percent of the 1988 yearend world reserves of more than 907 billion barrels of crude petroleum.[3] World production of crude

[3] "Reserves Up Worldwide and Outside OPEC," *Oil and Gas Journal,* Dec. 26, 1988, pp. 43-45.

1-1

Table 1-1

Crude petroleum: Reserves and production of crud. petroleum-rich nations, 1988

Area/Nation	Proved reserves		Production	
	1988 Year-end reserves'	Share of total in percent	1988 Productions	Share of total in percent
	(million bbl)		(1,000 bbl/day)	
North America:				
Canada	6,786	0.7	1,605	2.8
Mexico	54,110	6.0	2,527	4.4
United States	26,500	2.9	8,166	4.2
South America:				
Argentina	2,268	.3	450	.8
BrazN	2,550	.3	556	1.0
Colombia	2,028	.2	347	.6
Ecuador'	1,350	.2	310	.5
Trinidad and Tobago	528	.1	149	.3
Venezuela'	58,084	6.0	1,658	2.9
Western Europe:				
Norway	10,435	1.1	1,069	1.9
United Kingdom	5,175	.6	2,376	4.1
Asia-Pacific:				
Australia	1,673	.2	552	1.0
Brunel	1,400	.2	138	.2
India	6,354	.7	631	1.1
Indonesia'	8,250	.9	1,138	2.0
Malaysia	2,922	.3	540	.9
Middle East:				
Abu DhabP	92,205	10.2	1,012	1.8
Dubai'	4,000	.4	355	.6
Iran'	92,850	10.2	2,208	3.8
Iraq'	100,000	11.0	2,679	4.6
Kuwait'	91,920	10.1	1,254	2.2
Neutral Zone (shared by Kuwait and Saudi Arabia)	5,210	.6	316	.5
Oman	4,071	.4	9,320	16.2
Qatar'	3,150	.3	349	.6
Saudi Arabia*	169,970	18.7	4,708	8.2
Sharjah'	1,500	.2	65	.1
Syria	1,730	.2	273	.5
North Yemen	1,000	.1	159	.3
South Yemen	3,380	.4	13	(•)
Africa:				
Algeria'	8,400	.9	667	1.2
Angola-Cabinda	2,024	.2	449	.8
Egypt	4,900	.5	851	1.5
Ubya	22,000	2.4	1,013	1.8
Nigeria'	16,000	1.8	1,358	2.4
Communist Areas:				
China	23,550	2.6	2.690	4.7
Soviet Union	58,500	6.4	12,477	21.6
M other	11,270	1.1	-	-
Total	907,443	'99.4	57,703	(•)

[1] As of Jan. 1 of the following year.
[2] Includes petroleum derived from shale and tar sands.
[3] Member of OPEC.
[4] Less than .05 percent.
• Totals do not add to 100 percent due to rounding.
• Totals do not add to 100 percent as the shares In this column are related to rates of production instead of to absolute volumes.

Source: 'Worldwide Report," *Oil and Gas Journal,* Dec. 26, 1988, pp. 48-49.

Table 1-2
Natural gas: Reserves and production of natural-gas-rich nations, 1988

Area/nation	Proved reserves 1988 Year-end reserves'	Proved reserves Share of total In percent	Production Share of 1987 Production	Production total In percent
	(billion cubic feet)		(billion cubic feet)	
North America:				
Canada	95,100	2.4	3,000	4.5
Mexico	74,831	1.9	931	1.4
United States	187,200	4.7	16,293	24.4
South America:				
Argentina	26,700	.7	544	.8
Trinidad and Tobago	10,500	.3	143	.2
Venezuela*	102,243	2.6	703	1.1
Western Europe:				
Netherlands	62,507	1.6	2,658	4.0
Norway	85,500	2.2	1,039	1.6
United Kingdom	22,740	.6	1,682	2.5
Asia-Pacific:				
Australia	16,633	.4	490	.7
Brunel	11,600	.3	307	.5
India	22,861	.6	297	.4
Indonesia=	83,590	2.1	1,291	1.9
Malaysia	51,700	1.3	547	.8
Pakistan	17,722	.5	420	.6
Middle East:				
Abu DhabP	183,500	4.6	445	.7
Irana	494,400	12.5	565	.9
Iraq*	95,000	2.4	132	.2
Kuwait=	42,500	1.1	187	.3
Qatar*	156,700	4.0	198	.3
Saudi Arabia*	145,848	3.7	946	1.4
Africa:				
Algeria*	104,200	2.6	1,525	2.3
Ubya	25,700	.7	177	.3
Nigeria*	85,000	2.2	131	.2
Communist Areas:				
China	31,700	.8	731	1.1
Soviet Union	1,500,000	37.9	25,674	38.5
M other	219,355	5.6		
Total	3,955,341	[2]100.3	66,780	'91.6

[1] As of January 1 of the following year.
[2] Member of OPEC.
[3] Totals do not add to 100 percent due to rounding.

Source: Reserves from "Worldwide Report," *Oil and Gas Journal,* Dec. 26, 1988, pp. 48-49; production from "World Natural Gas Survey," *Petroleum Economist,* August 1988, p. 257.

petroleum from OPEC-member nations increased in 1988 to 19.3 million barrels per day, approximately 1.5 million barrels per day higher than their average production in 1987, and 3 million barrels per day above the self-imposed quota system set by OPEC in 1986. Natural gas reserves follow the trends in crude petroleum reserves since most of the natural gas produced is associated with petroleum drilling. Worldwide reserves of natural gas increased by more than 4 percent in 1988 to 3,955 trillion cubic feet.[4]

World energy consumption increased by 2.8 percent, from 55.7 billion barrels of crude petroleum equivalent (bbcpe) in 1986 to 57.3 bbcpe in 1987 (see table 1-3).[5] Of the principal forms of energy consumed, the fastest rate of growth during 1986-87 was in nuclear power, which increased by 7.2 percent. Crude petroleum and natural gas accounted for 58 percent of the world's energy consumption in 1987.

Feedstock and energy advantage

An abundance of natural resources, particularly those resources associated with the production of energy, provides advantages in the development of certain industries. Such industries, which have come to be known as energy-intensive industries, have been cited and referenced in previous Commission publications.[6] The U.S. Department of Commerce 1982 ***Census of Manufactures,*** indicated that the industry

[4] "Reserves Up Worldwide and Outside OPEC," *Oil and Gas Journal,* Dec. 26, 1988, pp. 43-45.
"Appetite Continues to Grow," *Petroleum Economist,* August 1988, pp. 265-266.

[6] U.S. International Trade Commission, *The Probable Impact on the U.S. Petrochemical Industry of the Expanding Petrochemical Industries in the Conventional Energy-Rich Nations,* (Investigation No. 332-183) USITC Publication 1370, April 1983.

Table 1-3
World primary energy consumption by type and by area, 1979, 1986, and 1987

Type/Area	Energy consumed during: 1979	1986	1987	Share of 1987 consumption in percent	Share change in percent, 1987 compared with: 1979	1986
	(million barrels crude petroleum equivalent)					
Crude petroleum	22,899	21,250	21,558	37.7	-5.9	1.5
Coal	14,425	16,991	17,489	30.6	21.2	2.9
Natural gas	9,397	10,900	11,405	19.9	21.4	4.6
Hydro-power	3,108	3,790	3,841	6.7	23.6	1.4
Nuclear	1,136	2,763	2,961	5.2	160.7	7.2
Total	50,965	55,963	57255	'100.1	12.3	2.8
North America	15,657	14,902	15,254	26.6	-2.6	2.4
Western Europe	9,485	9,382	9,500	16.6	.2	1.3
Japan	2,712	2,727	2,771	4.8	2.2	1.6
Australasia	608	711	733	1.3	20.5	3.1
Total, OECD[2]	28,462	27,722	28,257	49.4	-.7	1.9
All other Free world	6,274	8,488	8,906	15.6	41.9	4.9
Total, Free world	34,737	36,210	'37,170	64.9	7.0	2.7
Total Communist bloc	16,236	19,483	20,084	35.1	23.7	3.1
Total World	50,973	55,693	57,255	100.0	12.3	2.8

Totals may not add due to rounding.
[2] Organization for Economic Cooperation and Development.
Source: Petroleum Economist, August 1988, p. 265.

sectors that consumed the largest amounts of energy (as defined by the Standard Industrial Classification (SIC) system of nomenclature) were SIC Industries 3312, Blast Furnaces and Steel Mills; 2911, Petroleum Refining; and 2869, Industrial Organic Chemicals (table 14). These three industries, along with the remaining 13 industries listed in table 1-4, accounted for 57 percent of total industrial energy consumption in the United States in 1977. By 1981, however, the top 16 industrial consumers of fuels and electric power, with only 1 change in composition since 1977, had managed to cut their absolute energy consumption from 12.9 trillion Btu's to 11.6 trillion Btu's, or at an average annual rate of about 2.5 percent. Despite this decline in overall consumption of energy, the cost of energy increased from $33.3 billion in 1977 to nearly $55.3 billion in 1981, an average annual rate of 13.5 percent.

Table 1-4
U.S. Industrial energy consumption, by SIC grouping, 1977 and 1981

SIC No.	Industry	Energy consumed 1977	1981	Cost of energy 1977	1981
		(trillion Btu's)		(million dollars)	
3312	Blast furnaces and steel mills	1,519	1,289	4,160	5,890
2911	Petroleum refining	1,223	1,065	2,247	4,381
2869	Industrial organic chemicals, n.e.c	1,096	899	1,844	2,815
2621	Paper mills, except building paper	588	591	1,294	2,521
2631	Paperboard mills	483	445	990	1,746
3241	Cement, hydraulic	453	385	733	1,034
2819	Industrial inorganic chemicals, n.e.c	422	347	1,141	1,679
3334	Primary aluminum	328	313	695	1,325
2873	Nitrogenous fertilizers	252	266	421	703
2821	Plastics materials and resins	183	185	479	931
2865	Cyclic crudes and Intermediates	172	135	385	610
2824	Organic fibers, noncelluloslc	148	131	365	540
3221	Glass containers	145	125	361	589
3079	Miscellaneous plastics products	140	124	568	1,005
3321	Gray Iron foundries'		112	–	704
3714	Motor vehicle parts	137	' 107	490	684
2812	Alkalies and chlorine[2]	127		137	–
	Largest 16	7,416	6,517	16,310	27,157
	Total	12,888	11,563	33,335	55,251

Not Included in "top 16" in 1977.
[2] Not included in "top 16" in 1981.
Source: Complied from official statistics of the U.S. Department of Commerce.

1-4

In addition to the energy consumed in the production process, feedstocks derived from these energy materials also contribute significantly to the cost of production of certain industries. Table 1-5 shows, in terms of the 4-digit SIC Industries, a rough accounting of the energy materials (particularly those rich in hydrocarbons) used as feedstocks in the production process of energy-intensive industries.

It can be seen that there are certain industries highly dependent upon energy and energy materials as shown in the data contained in tables 1-4 and 1-5. Such industries would be expected to be initially selected in the case of a nation seeking to foster industrial development based on its indigenous natural resources. Table 1-6 shows the total costs to those U.S. industries with the greatest overall dependence on such materials in terms of (1) absolute expense associated with purchases of energy and energy materials and (2) the share of the total value of shipments represented by expenditures for energy and energy materials.

Direct foreign investment in the United States

In 1987, foreign investment in the U.S. petroleum industry totaled Si billion, of which 67 percent was accounted for by foreign direct investors and 33 percent by U.S. affiliates of foreign companies.[7]

[7] U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business,* May 1988, p. 51.

Table 1-5
Industrial consumption of energy materials In the form of feedstocks

SIC No.	Industry	Materials consumed in production process, 1982		Ratio (percent) of cost of materials derived from hydrocarbon-rich materials to total cost of materials, 1982
		Total	Materials derived from hydrocarbon-rich materials	
		million dollars		
3011	Tires and Inner tubes	4,037.9	2,252.3	55.8
3079	Miscellaneous plastics products	17,099.3	9,359.0	54.1
3041	Rubber and plastic hose and belting	764.5	400.7	52.4
3069	Fabricated rubber products, n.e.c	2,744.0	1,127	41.1
2643	Bags, except textile bags	2,797.3	1,000.7	35.8
3021	Rubber and plastic footwear	277.5	85.4	30.8
2641	Paper coating and glazing	2,857.2	743.5	26.0
3715	Truck trailers	1,092.0	112.7	10.3
2651	Folding paperboard boxes	2,089.1	113.5	5.4
2652	Set-up paperboard boxes	166.1	7.8	4.7
3678	Electronic connectors	856.1	39.5	4.6
3714	Motor vehicle parts and accessories	17,772.2	792.2	4.5
3531	Construction machinery	5,507.9	237.1	4.3
3711	Motor vehicles and car bodies	54,582.8	2,052.3	3.8
2655	Fiber cans, drums, and similar products	850.0	27.4	3.2
3713	Truck and bus bodies	1,227.0	37.5	3.1
2653	Corrugated and solid fiber boxes	6,511.8	174.4	2.7
2654	Sanitary food containers	1,423.9	37.4	2.6
3499	Fabricated metal products, n.e.c	1,763.8	36.5	2.1
3494	Valves and pipe fittings	3,211.5	64.5	2.0
3535	Conveyors and conveying equipment	1,113.2	21.1	1.9
3679	Electronic components, n.e.c	5,455.6	100.3	1.8
3537	Industrial trucks and tractors	1,040.7	16.5	1.6
3674	Semiconductors and related devices	2,966.6	41.1	1.4

Source: Compiled from official data of the U.S. Department of Commerce.

Table 1-6

Energy-intensive Industries ranked by (1) absolute value of energy materials consumed as fuel or feedstock and (2) value of energy materials consumed as fuel or feedstock as a share of total shipments

SIC No.	Industry	Sum of energy materials consumed as: Feedstocks	Energy	Total	Shipments	Energy materials consumed as a share of shipments	Rank By absolute value of energy consumed	Rank By energy consumed as share of shipments
		million dollars				percent		
2911	Petroleum refining	4,381	148,781	153,162	199,723	76.7	1	1
2869	Industrial organic chemicals, n.e.c	2,815	8,305	11,120	30,394	36.6	2	6
3079	Miscellaneous plastics products	1,005	9,359	10,364	37,009	28.0	3	9
2821	Plastics materials and resins	931	6,451	7,382	15,814	46.7	4	4
3312	Blast furnaces and steel mills	(1)	5,890	5,890	36,824	16.0	5	
2824	Organic fibers, non-cellulosic	540	3,726	4,266	8,288	51.5	6	2
2865	CycNo crudes and intermediates	610	2,255	2,865	7,138	40.1	7	5
3711	Motor vehicles and car bodies	518	2,052	2,570	70,740	3.6	8	
3011	Tires and inner tubes	279	2,252	2,531	9,340	27.1	9	10
2621	Paper mills, except building PaPer	(1)	2,521	2,521	20,995	12.0	10	
2819	Industrial organic chemicals, n.e.c	1,679	162	1,841	12,060	15.3	11	
2631	Paperboard mills		1,746	1,746	9,531	18.3	12	16
2873	Nitrogenous fertilizers	70[1]	906	1,609	3,391	47.4	13	3
3714	Motor vehicle parts	684	792	1,476	36,293	4.1	14	
3334	Primary aluminum	(1)	1,325	1,325	5,037	26.3	15	11
3069	Fabricated rubber products	184	1,127	1,311	6,366	20.6	16	14
3241	Cement, hydraulic		1,034	1,034	3,542	29.2		7
2812	Alkalies and chlorine	444	4	448	1,571	28.5		8
3041	Rubber and plastics hose belting	65	401	466	1,964	23.7		12
2641	Paper coating and glazing		743	1,164	5,454	21.3		13
2643	Bags, except textile bags		1,001	1,023	5,038	20.3		15

(1) Products of this sector do not use energy materials as feedstocks.

Source: Complied from official statistics of the U.S. Department of Commerce.

The tabulation at the bottom of the page shows the foreign investor, U.S.-based firm, and percent of foreign ownership in the U.S. firm in 1987.[8]

In 1987, foreign-affiliated companies accounted for 17.8 percent of total U.S. reserves of crude petroleum and natural gas and 16.3 percent of production.[8] Foreign-affiliated companies accounted for 21 percent of the. total U.S. capacity to refine crude petroleum.[18]

[8] "The 100 Largest Foreign Investments in the U.S.," *Forbes,* July 25, 1988, pp. 240-246.

[18] U.S. Department of Energy, *Profiles of Foreign Direct Investment in U.S. Energy, 1987,* Dec. 31, 1988, p. 12.

[18] Ibid., p. 13.

Foreign Investor	U.S. Investment	Percent Ownership
Royal Dutch/Shell Group (Netherlands/United Kingdom)	Shell ON	100
British Petroleum Pic (United Kingdom)	BP America*	100
Petroleos de Venezuela, SA (Venezuela)	Cttgo Petroleum	50
	Champlin Refining	50
Petrofina, SA (Belgium)	American Petrofina	83
Total CFP (France)	Total Energy Resources	100
Kuwait Petroleum (Kuwait)	Santa Fe International	100
Broken Hill Proprietary (Australia)	Utah international	100
	BHP Petroleum	100
	Hamilton Oil	51

In 1987, British Petroleum acquired 100 percent of Standard 011 Co. Standard Oil's operations were combined with those of BP North America to form BP America.

1-6

Chapter 2

Mexico

Many of Mexico's downstream industries are dependent on the nation's reserves of crude petroleum and natural gas. Mexico had proved reserves of 54.1 billion barrels of crude petroleum and 74.8 trillion cubic feet of natural gas, as of January 1, 1989.[1] Crude petroleum production in 1988 averaged approximately 2.5 million barrels per day. .Mexico had nine refineries in 1988 with the combined capacity to refine 1.4 million barrels of crude petroleum per day.[2]

Beneficial Government Practices

Mexico's petroleum and natural gas industries operate under the sole purview of Petroleos Mexicanos (PEMEX), the state-owned company formed in 1938 to maintain petroleum industry productivity after Mexico nationalized the industry and expropriated foreign investments. Because PEMEX has sole responsibility for the exploitation and production of Mexico's natural resources, it is difficult to ascertain domestic prices for crude petroleum, which is transferred between different Government entities at unknown prices. The transfer price essentially represents internal pricing practices and is seldom made public. Generally, it is believed that these transfers occur at below the world price but not below the cost of production. The estimated cost of petroleum production in Mexico is within the range of $3 to $6 per barrel.

Mexico's National Industrial Development Plan (NIDP) states that fossil-fuel prices have traditionally been lower than international prices to strengthen the consuming industry by giving it "a substantial margin of protection via input."[3] Mexico's National Energy Program for 1984-88 stated that domestic hydrocarbon prices would be maintained at a level lower than the international market price. The Government of Mexico maintains a two-tiered industrial pricing policy for petroleum products such as No. 6 fuel oil and natural gas; these products are usually sold to domestic industrial consumers at below world prices but exported at international market prices.

In an effort to strengthen the economic situation in Mexico, the Economic Solidarity Pact of December 1987 and its successor, the Pact for Stability and Economic Growth (PECE) of December 1988, placed controls on prices, wages, the public sector, and the exchange rate. These pacts also established policies to open the economy and restrain private sector producers from raising prices for goods produced for domestic consumption. As a result of the pacts, inflation has declined. In June 1989, the Government announced that the PECE was extended through March 1990.•

The following tabulation shows internal Mexican prices for natural gas (in U.S. dollars per thousand cubic feet) and No. 6 fuel oil (in U.S. dollars per gallon):[5]

	Natural gas-		No. 6 fuel oil-	
Year	U.S. price	Mexican price	U.S. price	Mexican price
1984 ...	$4.22	$1.58	$0.68	$0.15
1985 ...	3.91	2.42	.58	.19
1986 ...	3.03	1.99	.34	.17
1987 ...	2.71	2.30	.42	.17
1988 ...	2.89	2.46	.33	.18

Although Mexican prices rose during 1984-88, they still remain below U.S. prices, especially in the case of No. 6 fuel oil. During staff fieldwork in Mexico, PEMEX officials have stated that feedstocks, such as natural gas and No. 6 fuel oil, necessary in the production of energy-intensive products, are sold to Mexican companies as well as to joint-venture companies at the same price level.

Investment Programs

Investment and development incentives in Mexico are highly complex and subject to numerous regulations on a case-by-case basis. The Mexican Government designated priority development zones in the nation and priority industries for special incentives. Among the priority zones are seacoasts, ports, and frontier zones where industrial development is encouraged to expand exports.e Specifically excluded are heavily populated areas such as Mexico City, Guadalajara, and Monterrey. Priority industries are divided into two categories: (1) agricultural industries and certain capital goods; and (2) various industries such as intermediate petrochemicals, metallurgical products, pharmaceutical products, and construction materials. Both categories qualified for special tax credits, with category 1 receiving the more attractive incentives.?

[1] "Worldwide Report," *Oil and Gas Journal,* Dec. 26, 1988, p. 49.
[2] Ibid.
[3] Government of Mexico, *Industrial Development Plan, 1979 1982 1990* (Abridged English Version), pp. 30-34.
[4] U.S. Embassy, Mexico City, Mexico, "Foreign Investment Climate Report," June 1989, p. 3.
[5] Brief filed on behalf of the American Cement Trade Alliance, Apr. 4, 1989, p. 5, and brief filed on behalf of the Mexican Cement Chamber (Canacem), May 2, 1989, exhibit B. U.S. prices for natural gas and No. 6 fuel oil were also derived from official statistics of the U.S. Department of Energy; Mexican prices were confirmed by representatives of Mexican companies during staff fieldwork in Mexico.
[6] U.S. Embassy, Mexico City, Mexico, "Foreign Investment Climate Report," June 1989, p. 15.
Ibid.

During the 1980s, the Mexican Government offered various incentive programs to encourage growth in priority development zones and industries. Certificates of Fiscal Promotion (CEPROFIS) were issued for tax credits; the tax credits ranging from 10 percent to 25 percent of the federal corporate taxes were available to companies operating in Mexico. The amount of the credit depended upon (1) the location of the investment, (2) the type of industry, (3) the amount of employment generated, (4) the purchase of machinery and equipment made in Mexico, and (5) the size of the company, with small investors being favored. CEPROFIS, valid for S years, may be used for payment of most federal taxes. They are not transferable. Mexican industrial taxpayers must obtain the explicit approval of the Ministry of Finance and Public Credit to obtain tax incentives. CEPROFIS must be considered as income in determining obligatory profit sharing but they are not considered as income for corporate purposes. The issuance of further CEPROFIS was terminated by a decree published in the Diario Official on November 25, 1988.[8] However, companies holding CEPROFIS prior to that date may continue to derive benefits for 5 years from the date of issuance.[9]

Nacional Financiera, S.A. (Nafinsa), the state-owned development bank, provides loans to companies operating in priority development areas. Nafinsa is active in promoting joint ventures between Mexican and foreign firms for the production of capital goods. Nafinsa operates through trust funds to promote industrial development. These funds include the National Fund of Industrial Development (FOMIN), which aids capitalization of small-and medium-sized industries by purchasing stock in the companies; the Fund for the Development of Industrials of Industry (FIDEIN), which acts to stimulate development of industrial parks in certain regions; and the National Pre-Investment Fund for Studies and Projects (FONEP), which finances feasibility studies. The FONEP program was terminated pursuant to a decree published in the Diario Official on November 25, 1988.[10] Nafinsa also has several trusts established for co-investments with foreign banks.

The National Foreign Commerce Bank (Bancomex) and the Fund for the Promotion of Exports of Mexican Manufactured Products (FOMEX) offer financing for industries producing goods for exportation. FOMEX also offers financing to Mexican manufacturers producing goods that will replace imports. The Bank of Mexico's Fund for Industrial Equipment Financing (FONEI) provides loans at preferential rates to firms producing goods for export."[11] FONEI also finances equipment purchases, feasibility studies, research and development, and working capita1.[12]

The Guarantee and Development Fund for Medium and Small Industries (FOGAIN) provides long-term financing to small- and medium-sized businesses. The terms of the loans vary with the location and the particular industry that receives the financing.

Foreign investors wishing to own property within 100 kilometers of the border and 50 kilometers from the coast may secure rights to the land through a trust ("fideicomisos") with a Mexican bank serving as the trustee. However, the trustee holds only the bare title to the property, with all other rights vested with the beneficiaries who may build on the land, sell the rights to others, or instruct the trustee to transfer the actual title of the property to a qualified Mexican owner.[13]

Foreign Investment Policies

New direct foreign investment in Mexico more than doubled during 1984-88 from $1.4 billion to $3.1 billion. Although the trends in foreign investment have improved during the period, direct foreign investment accounts for a relatively small, 10 percent of total gross fixed investment in the economy and slightly more than 7 percent of private fixed investment in the economy.[14] During 1984-88, authorized foreign investment increased from $12.9 billion to $24 billion.

Foreign investment is welcome in Mexico, except for those industries reserved for the Mexican Government; however, it is subject to close Government scrutiny and regulation, particularly in cases of majority foreign ownership. The rules governing foreign investment are contained in three laws originally enacted during the 1970s. The most important of these laws is the 1973 Law to Promote Mexican Investment and Regulate Foreign Investment, which is aimed at codifying previously existing laws, policies, and regulations governing foreign investment. This law applies to investments in Mexican businesses and the acquisition of Mexican real and personal property. It requires that all foreign investments in Mexico be registered at the National Register of Foreign Investment. Any expansion, relocation, or

Brief filed on behalf of Negro de Humo Negromex, April 27, 1989, p. 3.

[9] Brief filed on behalf of the American Cement Trade Alliance, (ACTA), April 4, 1989, p. 12.

[10] Brief filed on behalf of Negro de Humo Negromex, April 27, 1989, p. 2.

" Brief submitted by Stewart and Stewart on behalf of PPG Industries, Inc., Feb. 28, 1989 and U.S. Embassy, Mexico City, Mexico, "Foreign Investment Climate Report," June 1989, p. 17.

[12] Ibid.

[13] U. S . -Mexico Chamber of Commerce "Mexico's In Bond-Maquiladora Industry: A Practical Guide for U.S. Investment," October 1988, p. 7.

[14] U.S. Embassy, Mexico City, Mexico, "Foreign Investment Climate Report," June 1989, pp. 2 and 36.

2-2

manufacture of new products by existing firms generally is treated as a new investment under this law. Under this legislation, the Mexican State has the exclusive right to explore and develop petroleum, natural gas, and other resources and produce basic petrochemicals, radioactive minerals, nuclear energy, electricity, railroads, telegraphic and radio communications, and certain other minerals. Other activities during 1984-88 were reserved exclusively for Mexican companies, including public road transportation, domestic air and maritime transportation, forestry exploration, and gas distribution. [15]

The 1973 Foreign Investment Law also established a National Foreign Investment Commission (NFIC) to regulate foreign investments and approve or disapprove projects. This is a semiautonomous agency within the Ministry of Commerce and Industrial Development (SECOFI) . [18] It is composed of members from the Ministries of Government, Foreign Affairs, Finance and Public Credit, Programming and Budget, Mines and Parastatal Industries, Commerce and Industrial Development, and Labor and Social Security. The private sector is not represented on the NFIC. The NFIC operates through the Executive Secretary and screens all applications for potential investors in line with criteria contained in Article 13 of the Law. The most important of the criteria are that foreign investment should (1) not displace national companies, which are operating satisfactorily or be directed into areas adequately covered by national companies; (2) have positive balance-of-payments effects, particularly by expanding exports; (3) increase local employment opportunities; (4) incorporate local inputs into its products; and (5) offer technological assistance to the country.

The NFIC allows 100-percent foreign ownership of the "maquiladoras" or "in-bond" industries, which assemble components under section 806.30 and 807.00 of the U.S. Tariff Schedules. Since 1981, the NFIC must approve any acquisition by a predominately Mexican holding company having foreign investors when the foreign share is increased to more than 25 percent of the capital of the holding company or when foreigners obtain the right to determine the management of the company. Mexican companies controlled by foreign investors must obtain prior authorization for the acquisition of more than 25 percent of the capital stock or 49 percent of the fixed assets of an existing enterprise regardless of whether it is to be purchased from Mexican or other foreign investors. Existing minority-share foreign investors may acquire up to 49 percent of the increase in capital although foreign investors which already own a majority share may purchase up to 100 percent of such new capital. [17]

A second important law, enacted in 1973, regulating foreign investment is the Technology Transfer Law, which imposes standards and prior registration requirements for patents, trademarks, technology and managerial services. [18] It is administered by the National Registry for the Transfer of Technology, which scrutinizes contracts based on criteria including costs and local availability of the same technology. The registry negotiates contracts so as to maximize local management of the companies. This law was intended to reduce dependence on foreign technology and provide state support to Mexican purchasers in their negotiations with the foreign companies.

Another important law is the 1976 Law on Inventions and Trademarks which was amended in 1986. The National Register of Transfers and Technology must approve all contracts for the use of patents and trademarks. Patents are issued for 14 years and are nonrenewable. They must be used within 3 years or a nonexclusive license to use the patent may be authorized of SECOFI. Among the notable changes made by the 1986 amendment is that product patents are not allowed for at least 10 years for chemical and pharmaceutical products, genetic processes to obtain plant varieties and animal breeds, and biotechnology processes.

Trademarks are registered for a 5-year period and may be renewed. A Mexican trademark lapses if not used within 3 years. The law requires that all products fabricated in Mexico be labelled with a distinctive Mexican trademark, which may or may not be linked to the foreign or international trademark.

Until 1989, the Mexican Government preferred that foreign investment be in the form of joint ventures with Mexican companies. [18] Exceptions were granted in cases where authorities consider the investments to be particularly attractive for Mexico, such as those offering technology transfer, significant employment generation and local content, large export potential, and industrial diversification.

On February 3, 1988, the NFIC published a general resolution intended to streamline the administrative procedures required for approval of foreign investments. The resolution required that the NFIC make a determination on foreign investment applications within 45 working days. [28]

[15] Ibid., p. 6.
[15] Ibid.
[17] Ibid., p. 7.
[15] Ibid., p. 6.
[10] Ibid., p. 5.
" Staff conversations with officials of the Embassy of Mexico, Washington, DC.

On May 16, 1989, regulatory changes to the foreign investment laws went into effect that are designed to attract more foreign capital into Mexico.[21] _ Under the new regulations, approval of investments of up to $100 million (except for those sectors reserved for the State and national companies) would be "automatic" and only require registration if they satisfied six basic conditions:

1. Capital should not exceed $100 million;
2. Financing should be external;
3. Projects should be located outside the Valley of Mexico, Monterrey, and Guadalajara where most of the nation's industry is concentrated;
4. Over the first 3 years of a project, there should be an "equilibrium on balance of foreign exchange;"
5. Permanent employment should be generated and training given to Mexican personnel; and
6. "Adequate" technology should be used to satisfy environmental requirements.

Foreign companies would also be given the opportunity to take majority control for a period of 20 years, through a system of trusts ("fideicomisos"), of industries and businesses in which they had been restricted to minority partnerships. It is estimated that about 60 percent of the Mexican economy would be open to foreign participation as a result of a broad revision of the regulations governing the 1973 foreign investment law.[22] Among the industries in which foreign companies could own up to 100 percent for 20 years via the trusts, are secondary petrochemicals (where the legal limit was set at 40 percent ownership prior to these regulatory changes), automotive parts (40 percent), minerals subject to special concessions (34 percent), financial leasing (49 percent), and fishing (49 percent). Applications for ventures in telecommunications (with a 49 percent limit) would still have to be referred to the National Foreign Investment Commission for approval.

Major Energy-Consuming Industries

The Mexican economy relies heavily upon revenues generated by the sale of crude petroleum. As a result of the severe decrease in world prices for crude petroleum beginning in late 1985, Mexico increased production in order to generate revenue. In 1988, production increased further, as the world price of crude petroleum remained somewhat stable. Mexico does not import crude petroleum; the following tabulation shows Mexican production of crude petroleum, exports, and apparent consumption (in thousands of barrels per day):[23]

Year	Production	Exports	Apparent consumption
1984	2,743.0	1,153.0	1,590.0
1985	2,630.5	1,434.3	1,196.2
1986	2,427.7	1,289.6	1,138.1
1987	2,540.6	1,345.1	1.195.5
1988	3,768.0	1,345.2	2,422.9

Note.—Data for 1988 are estimated.

During 1980-85, Mexico was the major supplier of crude petroleum to the United States. However, Mexico became the third major supplier in 1986, 1987, and 1988 as OPEC nations exported larger quantities of crude petroleum to the United States. The U.S. Department of Energy has purchased about 50,000 barrels of Mexico's Isthmus crude petroleum per day from PEMEX since 1981 for storage in the U.S. Strategic Petroleum Reserve (SPR).[24] Approximately 40 percent of the crude petroleum stored in the SPR caverns originated in Mexico.

Natural gas production follows the trends in crude petroleum since more that 80 percent of Mexico's natural gas production is associated with the production of crude petroleum. There is some trade in natural gas between Mexico and the United States via a pipeline that connects to the U.S. pipeline system in Texas. The United States had been the only market for Mexican exports of natural gas; however, a selling price disagreement resulted in the cessation of sales in November 1984. Mexico imports small quantities of natural gas from the United States. The following tabulation shows Mexican natural gas production, imports, exports, and apparent consumption (in billions of cubic feet):[25]

Year	Pro- duction	imports	Exports	Apparent consumption
1984	1,263	2	52	1,213
1985	1,200	2	0	1,202
1986	1,150	2	0	1,152
1987	1,277	2	0	1,279

Note. —Data for 1988 are not yet available.

PEMEX is the sole owner of Mexico's 9 refineries and 21 plants producing "basic" petrochemicals.[25] PEMEX also handles all

[21] "Mexico Plans New Investment Rules," *Financial Times, May* 17, 1989, p. 17 and U.S. Embassy, Mexico City, Mexico, "Foreign Investment Climate Report," June 1989, p. 3 4.
[22] Ibid.
[23] PEMEX, *Memoria de Labores 1987,* 1987, *Petroleum Economist,* various issues.
" The SPR contains petroleum stocks maintained by the Federal Government for use during periods of major supply interruption.
[25] Derived from official statistics of the U.S. Department of Energy and from various issues of *Oil and Gas Journal.*
[25] Mexico's petrochemical industry is divided by law into two sectors. The production of 36 "basic" petrochemicals from crude petroleum and natural gas is reserved for PEMEX. The production of "secondary" petrochemicals,

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exports and domestic sales at the wholesale level. Retail prices and taxes on all fuels sold domestically are set by the Secretariat of Hacienda (finance).

The PEMEX Board of Directors has 11 members, 6 appointed by the President and 5 appointed by the Petroleum Workers Union. Organizationally, PEMEX is divided into seven subdirectorates: construction, primary production, industrial transformation (refining and petrochemical production), sales, finances, administration, and planning. PEMEX employed approximately 210,000 workers during 1987; nearly 95 percent of these employees are members of the Petroleum Workers Union?"

Current regulations, effective May 16, 1989, allow for 100-percent-foreign ownership of secondary petrochemical operations. Prior to this regulation, the production of secondary petrochemicals, was limited foreign investment to 40 percent. The following tabulations list items that are classified as basic and secondary petrochemicals:[28]

Basic Petrochemicals Reserved for PEMEX

1. Acetaldehyde
2. Acetonitrile
3. Acrylonitrile
4. alpha-Olefins
5. Ammonia
6. Benzene
7. Butadiene
8. Carbon black feedstock
9. Cumene
10. Cyclohexane
11. Dichloroethane
12. Dodecylbenzene
13. Ethane
14-. Ethylbenzene
15. Ethylene
16. Ethylene oxide
17. Heptane
18. Hexane
19. Isopropanol
20. Methanol
21. Methyl-tertiary-butyl ether
22. n-Paraffins
23. Olefins
24. ortho-Xylene
25. para-Xylene
26. Pentane
27. High density polyethylene
28. Low density polyethylene
29. Polypropylene
30. Propylene tetramer
31. Styrene
32. Toluene
33. Vinyl chloride
34. Xylene

Secondary Petrochemicals

1. Acetic acid
2. Acetic anhydride
3. Acetylene
4. Acrolein
5. Acrylic acid
6. Aliphatic solvents
7. Allyl alcohol
8. Allyl chloride
9. Aromin 150
10. n-Butanol
11. Butyraldehyde
12. Carbon tetrachloride
13. Chloroform
14. Chloroprene
15. Ethyl chloride
16. Ethyl hexanol
17. Ethylene chlorohydrin
18. Ethylene dibromide
19. Hydrocyanuric acid
20. Isoprene
21. Lauryl alcohol
22. Methyl chloride
23. Methylene chloride
24. Naphthalene
25. Nonane
26. Oxo-alcohols
27. Polybutylene
28. Polypropylene
29. Propylene chlorohydrin
30. Propylene dichloride
31. Propylene oxide

"-Continued
except fertilizers, is open to and dominated by private investors; however, foreign investment was limited to 40 percent of the equity of any petrochemical plant in Mexico prior to the May 16, 1989 legislation allowing for 100 percent foreign ownership. Fertilizer production is reserved for one Government-owned company, Fertimex.

[27] U.S. Department of State Telegram, "Mexican Petroleum Industry Report," July 15, 1988, p. A 28.
"Mexico's Investment Rules Limit Petrochemical Industry Expansion," *The Journal of Commerce, May* 10, 1989, p. 4B.

32. Tetrachloroethane
33. Trichloroethylene
34. Trichloroethane
35. Vinyl acetate
36. Vinyl toluene

Another regulatory change that provided an additional incentive for investment in the Mexican petrochemical industry, where permitted, was the elimination of the requirement of PEMEX as a broker, or middleman, for all import transactions. Additionally, certain programs, which provided concessionaire prices to firms for primary petrochemical products and energy, and were available for certain industries operating in the secondary petrochemical sector were eliminated.[29]

Article 27 of the Mexican Constitution contains the enabling legislation that created the Petrochemical Commission to review requests for foreign investments in petrochemical production in Mexico. During 1988, this commission approved significant new foreign investments in Mexico valued at approximately $250 million, expected to result in additional annual capacity of 900,000 metric tons of secondary petrochemicals.[30] Projects involving materials not currently produced in Mexico, and those involving capacities below internal demand levels, tend to be viewed more favorably by the Mexican Government. Also, potential environmental impacts are now believed to be part of the considerations of the Mexican Government when projects are being reviewed.[31]

Carbon black

Industry profile. -There are no barriers to foreign investment in the Mexican carbon black industry. There are two Mexican producers of carbon black: Negro de Humo Negromex, S.A. de C.V. (Negromex) and Hules Mexicanos, S.A. de C.V. (Humex). Negromex is 60-percent owned by a Mexican company, Novum. In the summer of 1988, Cabot Corporation, a U.S.-based carbon black producer, purchased 40 percent of Negromex.[32] Humex is privately owned by Mexican private sector interests. Until 1988, Humex had been 60-percent-owned by PEMEX; however, as part of Mexico's privatisation plans, PEMEX's interest in Humex was sold?

Carbon black feedstock (CBFS) is a type of residual fuel oil produced as a byproduct of petroleum refining processes. The heavy fractions left after the catalytic cracking of crude petroleum are called catcracker bottoms, which are used as CBFS. Since all petroleum refining is carried out by PEMEX, it is the sole source of CBFS in Mexico.

Together, the two carbon black producers operate a total of three carbon black plants. Two of the plants use CBFS derived from the refining of Mexican Mayan crude, which is high in sulfur content. One plant uses CBFS derived from the refining of the lower-sulfur Isthmus crude petroleum. Both Negromex and the wholly Mexican-owned Humex have access to CBFS from PEMEX at the same price.

Domestic market. -Industry sources estimate Mexican production of carbon black at about 220 million pounds per year. Mexico is the second-largest supplier of carbon black imports to the United States. The following tabulation, derived from official statistics of the U.S. Department of Commerce, shows U.S. imports of carbon black from Mexico and U.S. exports to Mexico (in millions of pounds):

Year	U.S. imports	U.S. exports
1984	49.7	4.1
1985	50.4	6.4
1986	33.6	7.2
1987	43.8	5.8
1988	35.8	6.4

The average price of U.S. imports of carbon black from all sources during 1984-88 has averaged $0.27 per pound. The average price of U.S. imports from Mexico has averaged $0.15 per pound. U.S. imports of carbon black from Mexico in 1988 represented an average of 11.7 percent of total U.S. carbon black imports and about 2 percent of U.S. apparent consumption.

Effects on production costs. -Mexico's pricing policies for No. 6 fuel oil and CBFS have provided the carbon black industry with a production • cost advantage. Prices for CBFS (which accounts for about 70 to 75 percent of the total cost to produce carbon black) from PEMEX are about half of the CBFS prices in the United States.[35] The following tabulation shows PEMEX prices for CBFS in U.S. dollars per barrel:[36]

1984	$8.40
1985	8.78
1986	7.81
1987	7.29
1988	9.28

Effects on competitiveness. -Mexican carbon black producers have an advantage in terms of the low price of CBFS since PEMEX produces the CBFS not for export but for sale to Negromex and Humex. CBFS in Mexico is priced

[23] Ibid.
[33] Ibid.
[31] Ibid.
[32] Brief submitted on behalf of Negro de Humo Negromex, S.A. de C.V., April 4, 1989, p. 1.
" Ibid.
" Ibid., p. 6-7.
" Ibid., p. 11.
[33] Brief submitted on behalf of Negro de Humo Negromex, S.A. de C.V. April 27, 1989, p. 15.

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approximately 50 percent less than CBFS in the United States, according to statements made on behalf of Negromex. However, the price of CBFS in Mexico has increased as part of the PEMEX plan to bring feedstocks up to world price levels.

Effects on resource allocation.—CBFS, which is derived from catcracker bottoms, is a valued product of the petroleum refining process. As a result of the lower cost CBFS available to Mexican carbon black producers, U.S. imports of carbon black have been priced below the average U.S. import price. If Mexican CBFS were priced at world levels, it is unlikely that Mexican exports of carbon black could undercut U.S. prices.

Cement

Industry profile.—There are no barriers to foreign investment in the Mexican cement industry. Under the provisions of the regulation implemented on May 16, 1989, 100-percent foreign ownership of cement production facilities is permitted[37]; however, prior to this regulatory change, foreign ownership of Mexican cement companies was limited to a maximum of 49 percent 3[8] The Mexican cement industry consists of 9 corporate groups operating a total of 29 cement plants. It is estimated that four of these corporate groups account for 90 percent of the market. About 20 of the plants are located south of Monterrey and account for an estimated 75 percent of Mexico's total production. As is true with the U.S. cement industry, Mexico's cement producers are located in the major areas of consumption. Four areas, the Federal District and the States of Veracruz, Jalisco, and Nuevo Leon, together accounted for about 42 percent of total domestic consumption. In addition to production plants, there are 31 distribution terminals located throughout the country to facilitate shipping and storage.

Plants are located throughout Mexico usually near deposits of limestone and clay, which are essential raw materials for the production of cement. Cement production capacity totaled approximately 32.8 million metric tons in 1987, up 6 percent from 30.9 million metric tons in 1984.[86]

During 1984-87, total employment of Mexican cement workers increased by about 10 percent to 15,369.[40] During this period, the number of production workers increased by 7 percent to 10,887 workers, about 71 percent of total employment in the industry. The number of nonproduction workers increased by 19-percent to 4,482 workers.[41] The larger increase for nonproduction workers versus production workers is due to the industry's continued modernization program. The replacement of old technology with new automated and computerized operational equipment reduced the need for laborers while increasing demand for more technically oriented personnel to administer the production system.[42]

Previously, limestone mining, which is an integral part of cement production, was limited to 34-percent foreign ownership by the 1973 Law to Promote Mexican Investment and Regulate Foreign Investment.[43] While two foreign companies, one each from the United Kingdom and Switzerland, own minority interest in Mexican cement companies that control an estimated 35 percent of the market, no U.S. firms hold ownership interest in any Mexican cement companies.[44]

The 1980 Development Program for the Cement Industry, which began in May 1980[46] and ended in April 1989[46], was implemented to stimulate Mexico's cement industry's production capacity and actual production.[47] As part of this program, the Government offered a package of incentives on the importation of machinery, energy discounts, and tax and loan incentives to those companies building new plants or expanding existing plants in designated geographic zones.[46] Specific incentives in the 1980 Program included a 75-percent rebate on the price of imported machinery;[49] a rebate to be applied to the import duty rate;[50 51] and discounts on the consumption of energy by industrial consumers of up to 30 percent for plants located in certain designated geographic regions.[52] Certain tax incentives and CEPROFIS were also authorized for the cement industry to provide tax credits for new investments in capacity expansion, for the purchase of new production equipment manufactured in Mexico and for the generation of new employment.[38]

[37] Meeting on May 16, 1989, with representatives of the Secretary of Commercial and Financial Industrial Development.
[36] American Cement Trade Alliance, prehearing submission, Apr. 4, 1989, p. 22.
[33] Camara Nacional de Cemento's (Mexican Cement Chamber) 1987 Annual Report.
[40] Ibid.
[41] Ibid.
[42] Conversation with representatives of the Mexican Cement Chamber, May 16, 17, and 19, 1989.
[43] American Cement Trade Alliance, prehearing submission, Apr. 4, 1989, p. 22.
" Conversation with representatives of the Mexican Cement Chamber, May 16, 1989.
" American Cement Trade Alliance, prehearing submission, Apr. 4, 1989, exhibit 2, p. 2.
[46] Letter from Director General of Industrial Development to President of the Mexican Cement Chamber, Apr. 28, 1989. This letter ends the 1980 Development Program for the cement industry.
" American Cement Trade Alliance, prehearing submission, Apr. 4, 1989, exhibit 2, pp. 2-3.
[42] Ibid., pp. 2-9.
[40] Ibid., p. 2.
[50] Meeting on May 16, 1989, with representatives of the Mexican Cement Chamber.
[61] Diario Oficial (Government of Mexico's Official Register), Jan. 24, 1989, pp. 10 11, and Mar. 6, 1989, pp. 4-8.
[62] American Cement Trade Alliance, prehearing submission, Apr. 4, 1989, p. 2.
" American Cement Trade Alliance, prehearing submission, Apr. 4, 1989, pp. 10-20.

These benefits were available on an equal basis to all Mexican firms regardless of the foreign ownership percentage .[54] Although the Mexican cement industry has been in a position to set its own cement prices since December 1982, industry representatives participated in a voluntary program between the Government of Mexico and industry sectors to hold commodity prices down in an effort to control inflation." This voluntary program became formalized under the provisions of the Solidarity Pact whereby representatives of the Government, labor, and industry sectors review their inflationary control agreements and results. With the increased prices in energy resources, cement representatives stated that attempts to hold down cement prices may be difficult during this next review process."

Domestic market.—During 1984-88, Mexican shipments of cement increased by 22 percent to 22.5 million metric tons in 1988, while consumption increased 9 percent to 17.8 million metric tons in 1988 (table 2-1). As is true for the world market, demand for cement closely follows construction trends in Mexico's market regions. Facing excess production capacity after the collapse in world petroleum prices in late 1985 and domestic demand, Mexican producers aggressively pursued export markets to maintain shipment levels.

Unlike the economic situation in Mexico, the strong growth in residential and public works construction occurring in many regions of the United States has stimulated U.S. demand for cement. As a result, in 1986, in an effort to reduce the level of unused production capacity, Mexican producers formed several joint ventures with U.S. producers and distributors to take advantage of already established distribution networks.[57]

During 1984-88, Mexican exports of cement and clinker increased from 2.1 million metric tons to 4.7 million metric tons. Mexico's exports of cement account for about 5 percent of total U.S. consumption of cement. It is estimated that the United States accounts for 95 percent of Mexican cement exports." " In 1988, an estimated 75 percent of Mexican exports to the United States were shipped to Florida, California, and Texas from eight plants located in the north and on the east coast of Mexico." Most Mexican exports (about 80 percent) to the United States are transported by ship with nearly all of the remainder entering by rail.[61]

In a 1983 U.S. Department of Commerce countervailing duty determination, the Mexican cement industry was found to have benefited from preferential government programs resulting in the placement of countervailing duties ranging from 0 to 17.12 percent." Subsequent reviews conducted by the U.S. Department of Commerce in 1985,[63] 1986,[64] and 1987" have reported zero to de minimis countervailable findings. Mexico's 1980 Development Program for the Cement Industry, which was the basis for the establishment of many of these preferential government programs, was officially cancelled April 29, 1989.[66]

" Conversations with representatives of the Secretary of Commerce and Finance during meeting on May 15, 1989, and conversations with representatives of the Mexican Cement Chamber during meeting on May 16, 1989.
a° Conversations with representatives of the Mexican Cement Chamber during meetings on May 16 and 19, 1989.
s° Ibid.
61 U.S. Bureau of Mines, "The Mineral Industry of Mexico," *Minerals Yearbook,* 1986, p. 595.
" Conversation with representatives of the Mexican Cement Chamber during meeting, May 16, 1989.
" While Mexico's duty rate on imports of cement is 10 percent, according to representatives of the Mexican Cement Chamber during meetings on May 16, 1989, U.S. imports of cement enter duty free.
ei° American Cement Trade Alliance, prehearing submission, Apr. 4, 1989, p. 29.
°' Conversation with representative of the Mexican Cement Chamber during meeting, May 16, 1989.
" Final Affirmative Countervailing Duty Determination and Countervailing Duty Order; Portland Hydraulic Cement and Cement Clinker from Mexico, 48 *F. R.* 43063.
63 Portland Hydraulic Cement and Cement Clinker From Mexico; Final Results of Administrative Review of Countervailing Duty Order, 50 *F. R.* 51732.
" Portland Hydraulic Cement and Cement Clinker from Mexico; Final Results of Countervailing Duty Administrative Review, 51 *F. R.* 44500.
°6 Portland Hydraulic Cement and Cement Clinker from Mexico; Final Results of Countervailing Duty Administrative Review, 52 *F. R.* 47618.
°° Letter from Director General of Industrial Development to President of the Mexican Cement Chamber, Apr. 28, 1989.

Table 2-1

Hydraulic cement and cement clinker: Mexican shipments, exports, Imports, and apparent consumption, 1984-87

(In thousands of metric tons)

Year	Shipments	Exports	Imports	Apparent consumption	Ratio (percent) of imports to consumption
1984	18,436	2,084	0	16,352	0
1985	20,680	2,412	0	18,268	0
1986	19,751	3,935	0	15,816	0
1987	22,347	4,550	0	17,797	0
1988	22,537	4,699	0	17,838	0

Source: Mexican Cement Chamber.

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Effects on production costs.-As in the world market, the direct production costs in Mexico vary from plant to plant depending on technology, quality and proximity of raw materials to the production facility. The following two tabulations contain current estimates of the various cement production costs in Mexico and the United States:

Mexican Production Costs

	Dollars per short ton		*Percent of total production cost*	
Raw material .	1.30	- 3.20	05	- 09
Fuel	5.40	- 8.40	20	- 24
Power	4.60	- 6.60	17	- 18
Production labor	3.20	- 5.20	12	- 15
Other costs' .	12.50	- 11.90	46	- 34
Total production costs ..	27.00	- 35.00	100	- 100

Includes maintenance, depreciation, etc.

Source: Mexican Cement Chamber.

U.S. Production Costs

	Dollars per short ton		*Percent of total production cost*	
Raw material .	3.00	- 4.50	10	- 10
Fuel	5.50	- 9.50	18	- 20
Power	4.50	- 8.00	15	- 17
Production labor	4.50	- 9.00	15	- 19
Other costs' .	12.00	- 16.00	40	- 34
Total production costs ..	30.00	- 47.00	100	- 100

Includes maintenance, depreciation, etc.

Source: American Cement Trade Alliance.

Total Mexican production costs for cement show an estimated range from $27.00-$35.00 per short ton, compared with 530.00-547.00 per short ton of cement produced in the United States, a difference of $3.00-512.00. In 1984, total production costs reported for Mexico ranged from 525.00-535.00 compared with $40.00-$50.00 for the United States, an overall difference of 515.00.[67]

The largest single cost factor in the production of cement is energy. In Mexico, almost 92 percent of energy consumed by the industry is in the form of fuel oil, while the remaining energy is consumed in the form of natural gas.[68] In the United States, well over 90 percent of cement is produced by using coal for fuel while a small amount of cement is produced by consuming natural gas.[68] The prices paid by Mexican industrial consumers for No. 6 fuel oil have been below prices paid by U.S. industrial consumers since 1984, although this gap has narrowed considerably in recent years.

In 1984, the average difference between Mexican fuel production cost per short ton of cement produced and that reported for the United States was $5.20[70] compared with a difference of $0.60 currently reported.[71] The decline in the Mexican fuel cost advantage was partly due to the elimination of certain of Mexico's Governmental programs; however, other Mexican production-cost advantages over U.S. firms are not attributable to programs of the Mexican Government. For example, there is a major cost difference for raw materials. In Mexico, plants tend to be located on or near limestone and clay quarries (key materials for the production of cement) providing cost effective access to raw materials.

In 1985 (the latest year for which figures are available) the U.S. cement industry consumed an estimated 150 kilowatt hours of energy for each short ton of cement produced. In comparison, Mexican cement producers consumed an estimated 120 kilowatt hours of energy for each short ton of cement produced.[72] Mexican cement production also has an advantage over U.S. cement production in terms of labor costs, which account for 15 to 20 percent of total production costs in the United States. U.S. production labor costs for the cement industry are higher than comparable labor costs in the Mexican cement industry. According to the production cost tabulations submitted by the American Cement Trade Alliance and by the Mexican Cement Chamber, the average production labor cost per short ton of cement produced is $6.75 for the U.S. industry compared with $4.20 for the Mexican industry.

Effects on competitiveness.-Cement is a homogenous product in terms of quality, performance, and design characteristics, and is, therefore, purchased primarily on the basis of price. In addition to production costs, transportation costs are a key factor in determining sales and marketing distances because cement has a low value-to-weight ratio. Transportation charges for overland shipments beyond 200 to 300 miles are usually such a large factor in the final delivered cost that consumers are forced to search for and purchase from close suppliers.

" U.S. International Trade Commission, Potential Effects *of Foreign Government's Policies of Pricing Natural Resources,* USITC Publication 1696, May 1985, pp. 43 and F 21.

Conversation with representatives of the Mexican Cement Chamber during meeting, May 16, 1989.

" U.S. International Trade Commission, *Potential Effects of Foreign Government's Policies of Pricing Natural Resources,* USITC Publication 1696, May 1985, p. F 21.

" Ibid., pp. 43 and F 21.

[71] Production cost tabulations for Mexico and the United States.

[72] Ibid., p. 41.

Comparing Btu values of Mexican heavy fuel oil prices with U.S. bituminous coal prices, the U.S. cement industry estimates that Mexican cement producers enjoy a $6.55 fuel advantage per ton of cement.[73] The U.S. cement industry further estimates that this $6.55 fuel advantage affords the Mexican industry an additional marketing distance of 72 miles for truck shipments, 218 miles for rail shipments, and 4,679 miles for maritime shipments.[74]

Although the fuel price advantage alone would allow the Mexican industry added marketing distance, the transportation infrastructure in Mexico seems to negate any advantage conferred by fuel price advantages. Most of Mexico's cement exports are transported to the United States by maritime shipments on internationally operated vessels, including U.S. vessels. The Mexican industry does not have ready access to its own shipping fleet, but instead must contract out shipments and pay the prevailing market price for fuel and freight.[75]

Rail freight costs, on a per ton-mile basis, tend to be higher than those in the United States. To illustrate the competitive costs, the following tabulation shows a comparative railroad freight analysis for equal distances:[76]

Mexico

Route:	Tamuin-El Prieto Ver.
Distance:	110 Km. (70 Miles)
Freight:	$2.85 per metric ton

United States

Route:	Brownsville-Harlingen
Distance:	110 Km. (70 miles)
Freight:	$2.50 per metric ton

Mexico has a less developed railroad infrastructure system than exists in the United States. Single track lines, limited loading capacity, and a shortage of locomotives, increase the Mexican industries' travel time and equipment utilization cost per ton of freight. To illustrate, the following tabulation shows the comparative equipment utilization cost:n

Premises:	Monthly railcar rent	$250.00
	Base distance	300 Km.

Mexico

Average load per car =	70 tons
Monthly trips per car =	3 trips
Railcar rental cost =	$1.19 per ton

United States

Average load per car =	90 tons
Monthly trips per car =	4 trips
Railcar rental cost =	$0.69 per ton

Effects on resources allocation.—Mexico does offer the cement industry some energy-fuel cost advantages. Because cement is a price sensitive product, an increase in the price of Mexican fuel oil to international prices would likely result in a decrease of exports into the U.S. market. However, both countries use two different fuel sources and Mexican average cost advantage of $0.60 per short ton of cement produced is small compared to Mexican average cost advantage of $6.90 in all production categories.

Float glass

Industry profile.—There are no barriers to foreign investment in Mexico's float glass industry. The regulatory changes enacted on May 16, 1989 allow non-Mexican investors to own 100 percent of float glass plants. Prior to this change, foreign investment was limited to no more than 49 percent. The Mexican float glass industry consists of two float glass plants owned and operated by separate companies of the Vitro corporate group.[78] Vitro is one of the largest private enterprises in Mexico and consists of some 90 companies employing 35,000 people. The parent holding group is diverse, producing nonmetallic minerals, glass and glass products, white goods, and capital machinery. Some of its companies are joint ventures with non-Mexican investors. Foreign partners include the British glassmaker Pilkington, Ford Motor Company (windshields and tempered glass), Owens-Corning and Philadelphia Quartz (fiber glass), and Whirlpool (white goods).[79]

Under the provisions of the May 16, 1989 regulatory changes, 100-percent foreign investment of downstream fabricating facilities is permitted. Foreign investment of up to 100 percent of the downstream fabricating facilities in

[73] American Cement Trade Alliance, posthearing brief, May 2, 1989, p. 4.
[74] American Cement Trade Alliance, information submission, May 23, 1989, pp. 2-3.
[76] Meeting with representatives of the Mexican Cement Chamber on May 17, 1989.
" Meeting with representatives Cementos Mexicans, S.A., May 19, 1989.
n Ibid.

[79] "Float" glass refers to the initial process of making all glass whose final products are basically flat in shape. Such products are known as "flat" glass. This initial production process floats a continuous, unbroken strip of raw molten glass on a bed of molten tin, slowing the cooling of the flat strip (ribbon) of glass as it moves down a production line. However, float glass must be modified for many applications, e.g., by strengthening it via a heat process to create tempered glass, placing a film between two pieces of float glass to laminate it (making safety glass), and/or shaping it for end products such as rounded skylights or curved automobile windshields. These downstream products are categories of "flat" glass.
[79] Also, Corning has had a 100 percent owned television picture tube (glass envelope) manufacturing facility in Monterrey since the 1960s.

the glass industry was previously permitted, if the production from such plants was exported. While diverse glass items (e.g., containers, fiber glass, float glass) represent Vitro's dominant product (about 55 percent of revenues), float glass itself constitutes an estimated 5 percent of total corporate revenues.[80] British-based Pilldngton, the largest glass manufacturer in the world and inventor of the float process, is a joint-venture partner (about 30 percent of total equity) in the subholding company (Vitro Plano, A.I.) of both float glass plants: the Monterrey-based company (Vitro Flotatdo) and the Mexico City facility (Vidrio Plano de Mexico).[81]

The Vitro float glass plant located near Mexico City had a 1988 production equivalent to approximately 18 million square meters of flat glass of 2 millimeters thickness. The Monterrey plant's 1988 production was approximately 3800 metric tons a week, equivalent to an annual production of approximately 27 million square meters of 2 millimeters thick flat glass.[82] The economics of float glass technology require that production continues around the clock, each day of the year, with only limited ability to modify annual tonnage output. Float glass technology is highly automated and total employment at the *Monterrey* plant is only 450, with a slightly smaller number at the Mexico City facility.

The two plants supply effectively all of internal Mexican demand as well as export 10-20 percent of their production. The plants sell flat glass to Vitro glass fabrication subsidiaries, and to other companies, for further processing into safety and tempered glass. A significant portion of these products is also exported.[83] The two Vitro plants represent less than 2 percent of global float capacity and utilize similar technology as other world-class producers (the Pilkington patented process). A new plant would cost an estimated $80 million. Production exceeds the current demand in Mexico. The excess capacity has been magnified by a major recession and other adverse economic circumstances that have developed since the second plant went on line.

Domestic market.—Mexican actual float glass production during 1984-88 was in the annual range of 45 million square meters of 2 millimeters thickness equivalents'. Both of Mexico's float glass plants were already on line (with limited production variability) by the time the 1982 recession severely depressed the principal end-use markets of new housing construction and car sales.

As a result, flat glass products were exported in order to sustain domestic production levels. Imports of float glass and float glass products into Mexico are negligible, limited to a few higher technology products, because there is adequate float capacity available domestically, and because foreign prices are prohibitively high (caused by high Mexican tariffs on these goods until 1986, and by the fall of the peso thereafter).[86] Imports come primarily from the United States ($22 million in 1988) and consist of unprocessed flat glass destined for added-value operations in the autoglass border fabrication plants, and subsequent return to the United States. Until the end of 1986, the Mexican glass market was protected by high tariffs and other restrictions. Mexico's decision to join the General Agreement on Trade and Tariffs (GATT) resulted in a lowering of its tariffs on imported float glass and float glass products (currently reported to be in the 5-20 percent range).[88]

Approximately 85 percent of Mexico's float glass and float glass product exports are to the United States. U.S. imports from Mexico account for less than 1 percent of U.S. apparent consumption of float glass. The following tabulation provides order-of-magnitude figures (in thousands of U.S. dollars) :[87]

Year	Exports
1983	$35,470
1984	53,395
1985	74,875
1986	76,660
1987	116,086
1988	116,928

Most Mexican float glass and float glass product exports to the United States are duty free, under GSP or 807 provisions. Exports to the United States are largely products made downstream from float glass, especially laminated

[80] Conversations with various Vitro officials, Monterrey, Mexico, Apr. 2-6, 1989.
[81] Ibid.
[82] Ibid.
[83] The Vitro subsidiary in which the Ford Motor Company holds a 40 percent equity share, for example, produces laminated and tempered glass for use in automotive manufacturing, and exports 35 40 percent of its production almost entirely to the United States. In the same way, two maquiladora companies produce automotive glass, buying at least a portion of their raw material, float glass, from the two Vitro plants. All of their products are exported. One of these facilities is a new plant 100 percent owned by the Ford Motor Company in Ciudad Juarez. The other is the 100 percent foreign owned Libbey Owens Ford/Nippon Sheet Glass plant in Mexicali. The latter is an illustration of the continuing globalization of the glass industry: an American company, Libbey Owens Ford, owned by Pilkington Glass of Great Britain, has allied with Nippon Sheet Glass of Osaka to produce glass in Mexico for export to the world market.

[86] Vitro has five flat glass plants that utilize prefloat technology. These are currently mothballed. It is unlikely that they will be brought back into service due to the vastly superior economics of float glass technology.
[87] All glass products, including such items as containers, dinnerware and fiber glass, represent 0.3 percent of total Mexican manufactured imports. This figure has remained generally constant throughout the 1980 88 period. Vielle, J.P., Loredo, J. and Pita A., "Mexican Glass Industry: Its Development and Market Prospectives Within a Global Economy," paper delivered to the Conference on Mexican Industrial Minerals in a World Context, Monterrey, Mexico, Apr. 4, 1989.
[88] Ibid.
[87] Compiled from U.S. Department of Commerce data.

and tempered glass for the original equipment motor vehicle market. Other Mexican export markets for float glass and float glass products are Guatemala, Ecuador, Venezuela and other Latin American countries.

As stated previously, Mexico did not previously permit foreign investors to hold a majority share of float glass and float glass product production facilities. Similarly, Mexican law also provides that foreign investors cannot own land within 100 kilometers of a Mexican frontier, which is important to the float glass industry because transportation and distribution costs are high.

The U.S. Government has had an agreement with the Mexican Government dating from 1984 stipulating that Mexican programs such as CEPROFIS, FOMEX, FONEP, or FONEI would not be used for the making of float glass. The U.S. Department of Commerce has monitored the agreement quarterly and verified its compliance annually since that time." The U.S. Department of Commerce has determined that Mexican motor vehide glass fabricators have received no preferential treatment from such programs since 1986, the latest ruling being dated March 2, 1989.[89] The Department of Commerce did determine that certain Mexican glass fabricators received a total bounty or grant of 2.45 percent ad *valorem* in 1984, and 0.17 percent ad *valorem in* 1985.[90]

Effects on production costs.—The percent of total production cost for each factor of Mexican production is roughly estimated as follows (percent) .[91]

Raw material (feedstock)	30
Energy	20
Labor	15
Overhead	15
Maintenance	5
Depreciation	10
Insurance and taxes	5
Total	100

Mexican flat glass costs are not significantly dissimilar to those prevailing in the United States. Vitro and other Mexican officials stated that the prices for natural gas available in Mexico in 1989 are the same, or indeed, perhaps as much as 5 percent higher than U.S. prices." In 1988, No. 6 fuel oil was reported to be about 45 percent below U.S. prices, e.g., $0.18 per U.S. gallon, as vs. $0.33 in the United States." It is known that the float glass plant in Monterrey converted its energy fuel source from natural gas to heavy fuel oil in 1988.

Representative prices for sales of raw float glass to first endusers, e.g., fabricators or distributors, are believed to be in the range from $0.30 to $0.60 cents per square foot of 3 millimeters thick glass, both in Mexico and the United States. Float glass with value-added features, such as special coatings to reflect heat, cost more; indeed, added-value production is now seen by most global float glass producers as a primary way to increase profitability. Raw flat glass prices have not increased significantly since 1985, due to the increased automation and competitiveness of the industry.

Effects on competitiveness.—Float glass plants are not labor intensive. A significant portion of the labor force of such plants is engaged in the warehousing-shipping side of the business. For Mexican float glass and float glass products to be exported to the United States, companies now generally establish a warehousing facility on the U.S. side of the border to meet customer requirements for just-in-time delivery. Such warehouses generate additional intensive labor costs, at U.S. labor prices. Vitro has established warehouses in Texas. The transportation and warehousing costs in Mexico are believed to represent some 20 percent of the total selling price of float glass products, compared to 12-15 percent in the United States. In terms of exports, Mexican shipments to the United States are concentrated in the U.S. south and southwest.

The cost of money in Mexico is high: commercial annual interest rates were 151 percent in 1986, 160 percent in 1987, and fell to about 87 percent in 1988. Annual inflation for the 3 years was approximately 105, 160 and 55 percent, respectively.

Effects on resources allocation.—Float glass and float glass product manufacturers have a cost advantage in terms of energy fuel costs. The latter, however, was not the dominant factor in deciding to build the two existing float glass plants, nor the only factor in the expansion of the downstream product plants developed later. Since Mexican natural gas prices have risen to near international levels, and Mexican and U.S. prices of like float glass are believed to be comparable, it is unlikely that a substantial change in the price of Mexican float glass would occur were Mexican natural gas prices equal to world price levels. However, there is more of a cost advantage associated with plants based on No. 6 fuel oil since heavy fuel oil in Mexico is priced substantially below world levels.

" 53 *F.R.* 53048, Dec. 30, 1988. This gives the background to this monitoring, as well as providing the latest determination that Vitro has not preferentially benefited from these programs.
" 54 *F.R.* 8782, Mar. 2, 1989.
[90] 51 *F.R.* 44652, Dec. 11, 1986.
[91] Conversations with Vitro officials, Monterrey, Mexico, Apr. 2-5, 1989.
[92] Conversations with Vitro and other Mexican industrial officials, Conference on "Mexican Industrial Minerals in a World Context," Monterrey, Mexico, Apr. 3-4, 1989.

" Testimony of Verner, Liipfert, Bernhard, McPherson and Hand, on behalf of the American Cement Trade Alliance, prehearing brief, Apr. 4, 1989, p. 5.

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Steel

Industry profile.—There are no restrictions on direct foreign investment in the Mexican steel industry.[94] Under the provisions of the regulations implemented on May 16, 1989, 100-percent ownership of iron and steel production is pennitted.[95] Mexico, Latin America's second-largest steel-producing nation, ranked 21st in the world in raw steel production in 1987, with 8.4 million short tons of production, up 6 percent from production of 1986 (table 2-2). Employment in the industry totaled approximately 60,000 in 1988, down from 89,000 in 1984.[96]

The Mexican steel industry is divided into public and private sectors. Siderurgica Mexican (SIDERMEX), the management group which controls the government steel mills, is Mexico's predominant steel producer accounting for 56 percent of raw steel production in 1987. SIDERMEX consisted of 2 of the country's largest integrated mills and approximately 36 steel-related firms.[97] " The private sector was composed of 2 integrated companies and approximately 20 nonintegrated mills, which accounted for 44 percent of the country's raw steel production in 1987."

During 1986, the Mexican government took a number of steps to restructure and modernize its steel industry. SIDERMEX reduced the number of steel-related firms from 87 to 36, principally through mergers.'" The government closed FUNDIDORA, the third-largest integrated steel producer, assumed nearly $1.6 billion in SIDERMEX's debt, reduced tariffs and non-tariff trade barriers and agreed to a bimonthly adjustment of steel prices to reflect inflation. In 1988, the government formalized its restructuring program with certain conditions to accept a $400 million loan from the World Bank. In a "Steel Sector Policy Letter" it agreed to modernize facilities, close inefficient plants, liberalize steel trade, decontrol steel prices, and phase out government subsidies.[101] The purpose of the World Bank loan was principally to restructure two major integrated steel mills, one of which is government-owned (Altos Hornos de Mexico SA de CV-Ahmsa) and the other of which is privately owned (Hylsa SA de CV).

Foreign investment in steel is relatively small and involves three companies. The first is a pipe and tube plant, Productora Mexicana de Tuberia, which is located in Mexico City. It is a joint venture between Nafinsa, SIDERMEX and a number of Japanese companies.'" The joint venture is a $130 million facility capable of producing approximately 300,000 tons of pipe per year.[193] The second facility is Tamsa-Tubos de Acero de Mexico SA, Mexico's second-largest privately owned pipe and tube mill, with a production of 458,000 short tons in 1987. The company has an undetermined amount of foreign financial investment according to the Bank of America in Mexico City. The investment is sourced in Italy and Argentina through a supply and service agreement. The Mexican Government also has investments in Tamsa, through Nafinsa.[194]

" U.S. Consulate, Monterrey, Telegram, "Barriers to Foreign Investment," Feb. 27, 1989.
" Meeting on May 16, 2989, with representatives of the Secretary of Commercial and Financial Industrial Development.
" Mexican industry sources.
'a U.S. Consulate, Monterrey, Mexico, *Outlook Report: Iron and Steel,* Mexico, Aug. 30, 1988.
[22] Integrated steel companies are defined as those companies that produce pig iron (in blast furnaces), as well as steel, in some or all of their plants. These firms generally produce steel in basic oxygen or open hearth furnaces, but may also use electric furnaces at some locations. Nonintegrated steel producers are defined as those companies that typically produce raw steel from ferrous scrap, or a combination of ferrous scrap and direct reduced iron, in electric furnaces.
°" U.S. Consulate, Monterrey, Mexico, *Outlook Report: Iron and Steel,* Mexico, Aug. 30, 1988.
"x' Ibid.
"" Thomas R. Howell, et al, *Steel And The State,* Government Intervention and Steel's Structural Crisis 1988, pp. 315-316.
[101] Information received from Mexican industry sources.
[103] Thomas R. Howell, William A. Noellert, Jesse G. Kreier, and Alan William Wolff, *Steel and the State, Government Intervention and Steel's Structural Crisis,* 1988, p. 315.
'" Bank of America, Mar. 17, 1989 and U.S. Consulate, Monterrey, Mexico, *Outlook Report: Iron and Steel,* Aug. 30, 1988.

Table 2-2
Raw steel: Mexican production capacity, and capacity utilization, 1984-88

Year	Production	Capacity	Capacity utilization
	1,000 short tons		*Percent*
1984	8,333	(1)	(1)
1985	8,121	(1)	(1)
1986	7,903	[2]9,871	110
1987	8,405	210,250	382
1988	[2]8,569	[2]10,450	382

(1) Not available.
[2] Estimated by Mexican steel Industry sources.
Estimated by the staff of the U.S. International Trade Commission.

Source: U.S. Consulate, Monterrey, Mexico, *Outlook Report: Iron and Steel Mexico,* **Aug. 30, 1988.**

The third project involves Precitube SA de CV, a small carbon steel pipe and tube plant (10,000 metric tons of annual capacity), which includes a 49 percent ownership by Transmesa, from Spain and 51 percent Mexican ownership. The ultimate holding company is Industrias Nacobre SA de CV.[106]

In terms of U.S. investment, Armco, a domestic steelmaker, divested its interests in Armco Mexicana S.A., a sheet steel and a welding company, and Aceros National S.A., a minimill wire product plant. The divestiture was reportedly related to efforts by the company to raise capital. Discussions with U.S. industry officials suggest little interest in future investment.

Domestic market.—Reflecting changes in economic conditions, Mexican apparent consumption of steel declined from 6.5 million short tons in 1984 to 5.5 million short tons in 1987 before rising to 5.8 million short tons in 1988 (table 2-3).

Mexico exported 1.5 million short tons of steel products in 1988 representing a 50 percent increase from 1984 when exports were 1.0 million short tons. Major export destinations include the United States (412,000 short tons in 1987), and the EC (101,710 short tons of sheet products in 1986). Exports to the United States, which account for less than 1 percent of U.S. consumption, are subject to limitations through September 30, 1989 under an agreement negotiated by the United States and Mexican Governments. Exports of sheets to the EC, on the other hand, are subject to antidumping duties. In light of these developments Mexico is reportedly developing export markets in Asia, Latin America and Saudi Arabia.[106]

In 1987, Mexico imported 340,000 short tons of steel products of which 58 percent, or 197,000 short tons, originated in the United States.

Effects on production costs. —Mexico's pricing policies on natural gas have influenced energy consumption in the production of direct-reduced iron (DRI), which is a primary material used in steelmaking. The DRI process of making iron is a generic name for newly developed technologies that supplant the blast furnace and coke oven as a source of iron for steelmaking. DRI is used by itself or in combination with scrap in electric arc furnaces.

An estimated average of 12 million Btu's of natural gas is consumed in making 1 short ton of DRiio7 At the Mexican price of $2.06 per thousand cubic feet (Feb. 1988) delivered to steel mill users,[108] versus a U.S. pricelcs of $3.23 (Feb. 1988) per thousand cubic feet delivered to industrial users,[110] this translates into a $1.17 savings to Mexican industry, per thousand cubic feet, or $14.04 per short ton cost savings in DRI production. This in turn translates into a $9.65 savings to the Mexican steel industry per ton of finished steel.

Effects on competitiveness.—In addition to the energy price advantage the Mexican steel industry is viewed as having a significant advantage over U.S. producers in the area of labor and iron ore cost. According to the U.S. Department of Labor, hourly compensation in Mexico during 1987 averaged $1.99 per hour, compared to $22.63 per hour in the United States."[1] At an estimated 3 work-hours per ton of finished steel produced in electric arc funiaces[112] the lower labor cost translates into approximately a $61.92 per ton cost advantage to the Mexican steel producers. The Mexican steel industry may also benefit from the lower cost of iron ore pellets, a raw material used to make DRI. The price of iron ore pellets in Mexico is estimated at approximately 70 percent of the U.S. market price. Iron ore pellets, priced (1988) at an estimated $35.00 per short ton in the

I" Metal Bulletin Books Ltd., "Iron and Steel Works of the World," 9th ed. 1987, p. 313.
'" U.S. Consulate, Monterrey, Mexico, *Outlook Report; Iron and Steel,* Aug. 30, 1988.

'or Estimated by the staff of the United States International Trade Commission on the basis of information received from Mexican and U.S. industry sources. 1MM Btu of natural gas equals approximately 1,000 cubic feet.
'" Based on estimates received from U.S. industry sources.
'oe U.S. prices are considered the equivalent to the international price for natural gas.
'" U.S. Department of Energy, *Natural Gas Monthly,* February 1989.
"' U.S. Department of Labor, Bureau of Labor Statistics, Office of Productivity and Technology.
·· ₂ According to U.S. minimill representatives.

Table 2-3
Steel mill products: Mexican production, exports, imports, and apparent consumption, 1984-88.

Year	Production	Exports	Imports	Apparent consumption	Ratio of imports to consumption
	1,000 short tons				Percent
1984	6,641	1,006	858	6,493	13.2
1985	6,508	482	622	6,648	9.4
1986	6,145	1,038	423	5,530	7.5
1987	6,394	1,221	340	5,513	6.2
1988	'6,714	'1,543	'661	5,832	11.3

' Estimated by Mexican Industry sources.

Source: U.S. Consulate, Monterrey, Mexico, *Outlook Report: Iron and Steel, Mexico,* Aug. 30, 1988.

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United States, [113] and consumed at 1.4 short tons per ton of DRI produced, amount to a cost of $49.00 per ton of DRI produced. The lower price per ton of iron ore pellets in Mexico amounts to approximately a 30 percent savings in the cost of iron ore pellet consumption per short ton, or an estimated $14.70 savings.

The overall production cost advantage for Mexico of approximately $86.00 per ton based on the use of direct reduced iron, labor cost, and iron ore pellets can be broken down by factor of production as follows:

$ 9.65 Energy (natural gas)
14.70 Raw materials (pellets)
61.92 Labor

$86.27 Total

The overall production cost advantage for Mexico of $86.00 represented an estimated 18-percent advantage in the import price of $473.00 for a short ton of steel mill products imported during 1988 into the United States.

"[3] World Steel Dynamics, Steel Strategist #15, Jan. 1989, table 26. •

Part of the cost advantage is negated by transportation, duties, and insurance costs from the Mexican manufacturing site to the U.S. market, which is estimated at $50 per short ton [114] in 1988.

Mexico's competitive cost advantage is further offset due to the fact U.S. producers use lower priced scrap rather than DRI in their electric furnace operations. Scrap cost in the United States of approximately $120 per short ton as a raw material for carbon steel compares with approximately $150 for a short ton of DRI for the same purpose.

Effects on resource allocation.—Prices of Mexican natural gas have increased considerably during the past few years and have lessened the gap between Mexican and U.S. prices. Any cost savings on natural gas as a result of Mexican Government pricing policies, represent a relatively small component affecting Mexican steelmakers' competitiveness.

"[4] Estimated by the staff of the U.S. International Trade Commission.

Chapter 3

Canada

The primary-energy-rich natural resources found in Canada are natural gas, crude petroleum, and uranium. Canadian reserves of crude petroleum, estimated to be about 6.8 billion barrels as of yearend 1988, are not as abundant or accessible as the reserves of natural gas found in Canada. Canada's proved reserves of natural gas are estimated to be approximately 95 trillion cubic feet as of January 1, 1989. Additionally, Canada has extensive hydroelectric capacity.

Beneficial Government Practices

The Canadian Federal and Provincial Governments offer no special incentive policies such as two-tier natural resource pricing to domestic or foreign companies operating in Canada. The Canadian Federal Government and Provincial Governments had, in the early 1980s, imposed various price control mechanisms on Canada's most abundant energy resource, natural gas. However, the Canadian price control mechanisms were not having the effect they were expected to achieve. Instead of maintaining a price advantage for Canadian consumers relative to the "world market," Canadian consumers were being forced to pay higher prices for Canadian gas than consumers in the United States were paying for U.S. gas. Another unintentional side effect seen during 1982-83 was the decline in demand for U.S. imports of Canadian gas for traditional markets in California and the Northern Tier States.

Foreign Investment Policies

The crude petroleum and natural gas industries in Canada continue to have significant shares of foreign ownership, primarily attributable to major multinational petroleum companies operating subsidiaries in Canada. According to Canada's National Energy Program that was employed during the early 1980's, a goal was established to increase Canadian ownership in the crude petroleum and natural gas sector of the Canadian economy.[1] Significant changes to Canada's energy policy since 1985 have not altered this primary goal. Currently, 50-percent Canadian ownership is required for the issuance of a production license on frontier lands. This regulation, relating primarily to foreign ownership of upstream petroleum and gas developments, was "grandfathered" in the Canada-United States Free Trade Agreement (FTA). Also, previously-existing policies that prohibit foreign interests from taking over financially healthy Canadian petroleum companies were retained.

The initial changes in the petroleum and natural gas regulations and policies, as established in the Western Accord,[2] abolished federal petroleum and natural gas taxes and scheduled the phase-out of the Petroleum and Gas Revenue Tax (PGRT).[3] In 1986, in relation to the rapid decline in world crude petroleum prices, the phaseout period was eliminated and the PGRT was immediately discontinued. New "fiscal relief measures" to assist the Canadian petroleum industry were announced in March 1987 in the form of the Canadian Exploration and Development Incentive Program (CEDIP). This action provided a rebate of one-third of eligible exploration and development expenditures to a maximum of C$10 million per company per year.[4] Provincial taxation relief measures were also implemented by the Governments of Alberta and Saskatchewan involving reductions in rates in Provincial royalty programs, the introduction of royalty "holidays" of various lengths in Alberta, and a 2-year exemption for crude petroleum wells drilled in Saskatchewan as long as the world price of crude petroleum remains below US$20 per barrel.[5]

While deregulation of the crude petroleum markets was accomplished with little problem, the deregulation of natural gas has proven to be far more complicated. In terms of pricing, the First 1986 November Agreement on Natural Gas Prices and Markets provides for free market negotiation between buyers and sellers as the determining factor for both Canadian domestic and export natural gas sales. Crude petroleum prices had previously been deregulated. Prices of electricity remain regulated by the individual Provinces such that there is uniform access to electricity for both the industrial and residential markets. There have never been controls in relation to the Canadian coal market.

In December 1987, a policy designed to attain a 51 percent Canadian majority ownership in the uranium mining sector was announced. Lower levels of Canadian ownership could be permitted in special cases where Canadian control can be demonstrated. Exemptions would also be allowed only if Canadian partners could not be found; such a situation would require Canadian Cabinet-level approval.[6]

Special provisions in the United States-Canada FTA assure both that there will be a

[1] U.S. International Trade Commission, ***Potential Effects of Foreign Governments' Policies of Pricing Natural Resources,*** USITC Publication 1696, May 1985, p. 4.

[2] Signed by Federal, Alberta, Saskatchewan, and British Columbia Governments in 1985.

[3] International Energy Agency, OECD, ***Energy Policies and Programmes of IEA Countries,*** Paris, 1988, p. 158.

[4] Ibid., p. 160.

[5] Ibid.

[6] Richard M. Williams and Robert T. Whillans, "Canadian Uranium Developments," presented at the U.S. Council for Energy Awareness Uranium Seminar, Tucson, AZ, Sept. 26, 1988.

guaranteed supply of uranium available for U.S. customers and that Canadian producers will not be affected by any enrichment restrictions imposed under the U.S. Atomic Energy Act, or by other import restriction contained in new legislation.

The investment climate in Canada for those basic petrochemical industries that offer the greatest potential advantage relating to the energy resources (ammonia and methanol) have almost always been friendly and open, especially toward investment from United States-based firms. However, during a short period from 1980 to 1983, the Canadian Government's official attitude toward foreign investors became somewhat negative, as indicated by the more stringent review of potential foreign investments by the Federal Investment Review Agency (FIRA), which led to a decreased rate of approvals compared with previous periods.? The FIRA, originally established through the Foreign Investment Review Act of 1973, was mandated to screen potential foreign investments in Canadian businesses in order to determine if they will provide "significant benefit to Canada." The FIRA sends its recommendations through the Minister for Regional Industrial Expansion to the Cabinet for a ruling of approval or disapproval. The factors weighed in the FIRA determinations are as follows:[8]

1. Potential for increased Canadian employment;
2. Potential for increasing Canadian exports;
3. The extent of Canadian manufacturing value-added;
4. Potential contributions to increased productivity and technological advancement;
5. The degree of Canadian ownership or management;
6. Potential impact on competition; and
7. The compatibility with Federal or Provincial industrial and economic policies.

Together with the NEP, these programs were later construed by industry observers as having generally been harmful to the Canadian economy during this period)?

Since the election of the Progressive Conservative Government in 1984, there has been a more supportive position assumed by the Canadian Government regarding foreign investment.' As of late 1984, projects submitted for review before the FIRA were being approved at a rate of approximately 95 percent. Also, those projected investments that were disapproved could be changed and resubmitted in a modified form (often with greater Canadian involvement) for another review.

An abbreviated form of review is also available for "small" investments (direct acquisitions involving assets valued at less than $5 million and fewer than 200 employees or indirect investments with limits of $15 million and 600 employees) ;t[11] however few investments in the methanol or ammonia industry would fall within these limits.

Additionally, in 1984, before the Progressive Conservative party assumed control, the Liberal Government announced that Canada would seek adherence to the OECD Code of Liberalization of Capital Movements. This code provides for free, unrestricted capital investment among OECD nations.[12] As of May 1985, the FIRA was abolished and replaced with the Investment Canada Act, which created a "new" agency known as Investment Canada. This change, from the FIRA to Investment Canada, was perceived as a move to begin strongly encouraging renewed foreign investment in Canadian industry. According to Minister of Industry Sinclair Stevens when introducing the Investment Canada legislation, "international investments, or partnerships, where Canadians and non-Canadians work together in Canada and abroad, can bring major benefits for Canada. Such investments are especially attractive, and the Act is based, in part, on this assumption."[13] Like the FIRA, Investment Canada reviews proposed acquisitions by foreign investors to ensure "net benefit to Canada."[14] Exempt from review are certain categories of investments including new ("greenfield") businesses and smaller acquisitions (direct investments valued at less than $5 million and indirect investments valued at less than $50 million). There are no other exemptions related to the methanol or ammonia industries.%

Under the United States-Canada FTA, the threshold level of review for U.S. investments was raised, as of January 1989, to C$25 million for direct investments with an agreement to further raise the limit to C$150 million by 1992. The limit for indirect investments was raised to C$100 million in January 1989, and will be phased out completely by 1992.[18]

[7] U.S. Department of Commerce, International Trade Administration, *Investment Climate in Foreign Countries, Vol. 1: OECD and Other European Nations,* August 1985, p. 69.
[8] Ibid.
[9] Ibid., p. 67.
[10] Ibid., p. 69-70.
[11] Ibid., p. 70.
[12] Organization for Economic Cooperation and Development, *Code of Liberalisation of Capital Movements,* Paris, 1988.
[13] Canadian Government news release, Dec. 7, 1984.
[14] Office of the U.S. Trade Representative, *1989 National Trade Estimate Report on Foreign Trade Barriers,* p. 31.
[15] Ibid.
[16] Ibid. , and Julius L. Katz and Paul J. Fekete, The United States-Canada Trade Agreement: An Analysis, paper prepared for the American Coalition for Trade Expansion with Canada (ACTE/CAN), Dec. 29, 19872

Major Energy-Consuming Industries

A significant share of Canada's petroleum reserves is found in tar sands and oil sands. Such reserves are much more expensive to recover than traditional deposits of crude petroleum, necessitating assistance to make recovery and refinement of such materials financially viable. Recently, several projects, including a planned expansion of a Canadian tar sands plant and a heavy oil recovery operation, were suspended through 1989 due to sagging petroleum prices." Additional reserves estimated at 7.1 billion barrels may be located beneath the Canadian Arctic regions,approximately twice the reserves estimated to be located in Western Canada, according to the Canadian Geological Survey. However, less than 50 percent of these reserves may be eventually recoverable because of geological and climatic complications.[18] Initial development is not expected to proceed until the world price of crude petroleum exceeds US$25 per barrel.[19]

Canada's proved reserves of natural gas were estimated to be approximately 95 trillion cubic feet as of January 1, 1989.[20] These reserves, located primarily in the Western Provinces (85 percent in Alberta), represent approximately 18 percent of all Western Hemisphere proved reserves of natural gas. For purposes of comparison, the United States had proved natural gas reserves of about 187 trillion cubic feet.[21]

Since 1984 there have been a significant number of uranium discoveries (primarily in northern Saskatchewan) leading to an effective increase in the volume of known uranium resources in Canada. As of yearend 1987, there were estimated to be known Canadian uranium ore reserves with approximately 559,000 tU (tonnes Uranium content), the same amount reported for 1986. This volume represents the amount recoverable from mined ores at a market price of $300 per kilogram uranium. About 46 percent of this volume is considered to be "low-cost" uranium.=

Canada is the leading Western hemisphere producer and exporter of uranium, with annual production estimated to be valued at about $1 billion. Approximately 85 percent of this production is exported to a number of electrical utilities located in various nations, principally the United States, France, the Federal Republic of Germany (West Germany), Japan, Korea, and the United Kingdom. In some cases, Canadian uranium ore was initially exported to other nations for enrichment before being shipped to its ultimate destination. Such out-of-country enrichment was done at centers in the United States, the Soviet Union, and France 2[3]

The five primary uranium production centers in Canada (Cluff Lake, Saskatchewan; Key Lake, Saskatchewan; Rabbit Lake, Saskatchewan; and two centers at Elliot Lake, Ontario) increased their production from 11,169 tU in 1984 to 12,456 tU in 1987, or by 12 percent 24 Production increased by 6 percent during 1986-87. These centers accounted for 34 percent of the total western hemisphere output of uranium in 1987. To place this volume in perspective, the energy content of the Canadian annual uranium production is equivalent to that of one billion barrels of crude petroleum (twice the annual Canadian output).[25]

The majority of the electricity generated in Canada is derived from hydroresources, which accounted for approximately 67 percent of total electrical output in 1986. The total electrical output of Canadian utilities increased steadily from 369 million megawatt hours in 1983 ton early 426 million megawatt hours in 1986, an increase of more than 16 percent. During the same period the electrical output generated from hydroresources increased from 263 million megawatt hours (71 percent of electrical output in 1983) to nearly 308 million megawatt hours (72 percent of electrical output in 1986), an increase of about 17 percent.=

Ammonia and methanol

Industry profile.—Foreign investment in Canada's major consuming industries is regulated by Investment Canada. Under this act there are reviews conducted of foreign investments over the limits described earlier; limits on U.S. investment are currently being either raised or phased out completely, with a target date of 1992. There are nine firms in Canada that produce ammonia, primarily for use as a fertilizer or fertilizer feedstock, and three firms that produce methanol. Six of these firms producing ammonia and methanol are subsidiaries of foreign-based multinational corporations, four are subsidiaries of Canadian multinationals, and two are domestic chemical companies. The ammonia producers are primarily located in Alberta and Ontario, the two major centers for Canadian petrochemical production, with additional facilities in British Columbia and Manitoba. Producers of methanol

" ***Oil and Gas Journal, Oct.*** 10, 1988, pp. 2-3.
" ***Oil and Gas Journal,*** Oct. 24, 1988, p. 89.
[10] Ibid.
[22] "Worldwide Report," ***Oil and Gas Journal,*** Dec. 29, 1988.
[21] Ibid.
[22] *Ibid.*

[22] Richard M. Williams and Robert T. Whillans, Canadian Uranium Developments, paper presented at U.S. Council for Energy Awareness Uranium Seminar, Tucson, AZ, Sept. 26, 1988.
" Ibid.
" Ibid.
[22] Ibid.

are located in Alberta and British Columbia, proximate to the large natural gas fields in Western Canada and the port facilities that service the Pacific Rim.[27]

The chemical industries of Canada, which benefit significantly from the availability of abundant reserves of energy resources such as crude petroleum and natural gas, continue to have significant shares of foreign ownership, primarily attributable to major multinational companies operating subsidiaries in Canada. Access to natural gas feedstock is not restricted based on ownership, but is available to all consumers at the same price.

Once a firm producing either methanol or ammonia has been established as a "Canadian company," there is no difference in the treatment accorded the company related to the composition of the capital ownership.

Although there is a policy that advocates use by Canadian companies of Canadian suppliers for necessary materials and supplies, a recently concluded GATT case required Canada to stop extracting such commitments from foreign investors.[28] Also, the FTA begins to end the imposition of "voluntary" performance requirements on U.S. investors based on the Investment Canada Act.[29]

Domestic market.—In general, production of natural-gas-based chemicals increased worldwide during 1988, as well as in Canada, mostly in response to the growing world demand for the products which are produced using these materials as feedstocks, such as plastics. Production data for ammonia and methanol are shown in the following tabulation (in thousands of metric tons) :[30]

Year	Production—Ammonia	Methanol
1984	3,493	1,801
1985	3,620	1,771
1986	3,540	2,065
1987	3,512	2,600
1988	'4,000	2887

Estimated.

[2] First 5 months of 1988, approximately 42 percent greater than the corresponding period of 1987. At that rate, 1988 production of methanol would amount to approximately 3,700,000 metric tons.

" Statistics Canada, *Canada Yearbook 1988,* November 1987, pp. 11-25 to 11-16.

" *Statistics Canada, Chemical and Chemical Products Industries,* various years, and U.S. International Trade Commission, *Potential Effects of Foreign Government's Policies of Pricing Natural Resources,* USITC Publication 1696, pp. 14-21.

[29] Office of the U.S. Trade Representative, *1989 National Trade Estimates Report on Foreign Trade Barriers,* p. 33.

[3] Ibid.

Estimated growth in production by the Canadian ammonia industry is believed to have been approximately 14 percent during 1987-88, although growth in the production of urea, a companion fertilizer made from ammonia, is estimated to have been nearly 26 percent during the same period. The rate of growth in the production of methanol was 16 percent during 1986-87 and increased to more that 40 percent during the first 5 months of 1988. Although such a high rate of growth for these natural-gas-based chemical industries is not expected to continue throughout 1989, industry sources believe that production growth will continue.

The value of Canadian exports of chemical materials increased significantly during 1987-88 to nearly $6.2 billion, an increase of 26 percent. Exports of methanol from Canada during 1988 amounted to 1,739,325 metric tons and were valued at $266 million. The United States accounted for 58 percent of those exports and Japan accounted for 39 percent. Canadian imports of all chemicals increased by 17 percent during the same period, with 75 percent originating in the United States. U.S. imports of Canadian methanol in 1988 were valued at $128 million,[31] accounting for 46 percent of U.S. imports and approximately 21 percent of U.S. apparent consumption. In 1988, U.S. imports of fertilizer-grade ammonia from Canada were valued at $135 million, and accounted for about 45 percent of total imports and approximately 7 percent of U.S. apparent consumption.

Steel

Industry profile.—The Canadian steel industry apparently receives no preferential treatment in the purchase of natural resource inputs to manufacture steel. With respect to foreign investment, of the total C$5.7 billion long-term investment in the Canadian iron and steel industry in 1985, 98 percent was controlled by Canadians.[32] According to discussions with Canadian steel industry and government representatives, Rio Algom Ltd. a British firm, was the only foreign owner with a major Canadian steel interest. The companies owned by Rio Algom were Atlas Specialty Steels in Welland, Ontario and Atlas Stainless Steels, at Tracy, Quebec 3[3] Recently, in March 1989, Sammi Steel Co. Ltd, Seoul, South Korea, issued a letter of intent to purchase both Atlas companies.[34]

[31] *Chemical and Engineering News,* Dec. 12, 1988, pp. 41-42, and *Chemical and Engineering News,* Dec. 14, 1987, pp. 43-44.

[32] The variation between reported Canadian exports to the United States and U.S. imports from Canada derives from the relative values of the Canadian and U.S. dollar.

[33] Discussions based with representatives of a major integrated steel producer, and the Department of Industry, Science, Technology, Canada.

[34] American Metal Market, Mar. 20, 1989, p. 1.

Under the recently adopted free trade agreement with Canada, all applications for U.S. investment in Canada are to be approved in a period of 45 days or less. According to industry sources one of the first major investments by a U.S. steel producer was applied for in January 1989 and approved by Investment. Canada in 15 days. It was Georgetown Industries' acquisition of Tree Island Industries, Ltd. in Vancouver, British Columbia, a major wire drawer.

The Canadian steel industry produced 16.6 million pounds of raw steel in 1988, an increase of about 3 percent compared with the 1987 production level of 16.1 million short tons (table 3-1).

The country ranked as the second-largest foreign supplier (after Japan) of steel products to the United States in 1988, accounting for 3.3 million short tons (or 15 percent) of imports; or about 3 percent of apparent consumption.

Exports increased from 3.4 million short tons in 1984 to 4.3 million short tons in 1987 before declining by 9 percent to 3.9 million tons in 1988. The major export market for Canadian steel products was the United States, which accounted for over 85 percent of total exports during 1984-88. Secondary markets were the Far East, EC, and South America.

In 1988, the Canadian steel industry consisted of 15 companies capable of producing raw steel and numerous companies which fabricated more advanced products from semi-processed material. The 15 companies included 4 fully integrated firms capable of producing steel from iron ore, 8 scrap-based companies, 2 producers of high-value stainless steels, and one producer specializing in semifinished steel billet production. Plants are concentrated along the St. Lawrence River and near the Midwestern United States, the largest U.S. steel-consuming region. The four integrated companies together account for over 75 percent of total Canadian raw steel production.[35]

During 1984-88 the Canadian steel industry made substantial gains in installing state-of-the-art equipment and in increasing productivity. Use of more advanced continuous casting technology, for example, increased, as 65 percent of raw steel production in 1988 was produced via this method, up from 35 percent in 1985.

Domestic market.-Improved economic conditions (particularly gains in auto production, construction and in general industrial production) resulted in increased demand for steel in Canada during 1984-88, as apparent consumption increased from 11.3 million short tons in 1984 to a period high of 13.7 million tons in 1988.[35] As demand increased, so did imports, which rose by 54 percent from 2.0 million short tons in 1984 to 3.0 million tons in 1988 (table 3-2). The increase in imports helped accommodate high consumption levels during a period in which Canadian facilities were running at near-capacity. The major sources of Canadian imports for steel mill products were the EC and Japan, each accounting for more than 25 percent of total imports.

le` Canadian Steel Industry Statistics Committee.
Canadian industry sources.

Table 3-1
Raw steel: Canadian production, capacity, and capacity utilization, 1984-88

Year	Production	Production capacity	Capacity utilization
	1,000 short tons	*1,000 short tons*	*Percent*
1984	16,058	23,519	68.3
1985	16,019	23,519	68.1
1986	15,419	19,815	77.8
1987	16,118	19,815	81.3
1988	16,596	20,238	82.0

Source: Canadian Steel Producers Association, *Steel Facts 1987,* and Canadian Steel Industry Statistics Committee.

Table 3-2
Steel mill products: Canadian production, exports, imports, and apparent consumption, 1984-1988

Year	Production/ shipments	Exports	Imports	Apparent consumption	Ratio of imports consumption
	1,000 short tons				*Percent*
1984	12,752	3,411	1,955	11,296	17.3
1985	13,211	3,593	2,204	11,822	18.6
1986	12,934	3,922	2,100	11,112	18.9
1987	14,082	4,283	2,257	12,056	18.7
1988	14,618	3,933	2,994	13,708	21.8

Source: Canadian Steel Industry Statistics Committee.

Chapter 4

Organization Of Petroleum Exporting Countries

The Organization of Petroleum Exporting Countries (OPEC) was founded in 1960 by Iran, Iraq, Kuwait, Saudi Arabia, and Venezuela as a unified front to deal with the major international petroleum companies.[1] By 1984, Algeria, Ecuador, Gabon, Indonesia, Libya, Nigeria, Qatar, and the United Arab Emirates (UAE) were members. The prfinary force behind the formation of OPEC was the unilateral cut in the posted price of crude petroleum made by the international petroleum companies in the spring of 1959 and again in 1960, which was a move to reflect the worldwide oversupply of this material at that time. Since the incomes of the OPEC nations were strongly dependent on the price of this resource, the first efforts of the organization were attempts to develop some stability in this source of income by restablishing the pre-August 1960 price levels.[2] The ultimate objectives of the organization, however, were to control the supply of crude petroleum and the pricing policies of its member nations.

OPEC has had problems in maintaining stability in pricing and in supply. The large price increases occurring during 1973-74, and again during 1979-80 resulted in decreased demand by the industrialized consuming nations brought about by the imposition of conservation measures and a shift to alternative fuels. Supplies of crude petroleum were increased as non-OPEC nations, such as Mexico and the United Kingdom, discovered additional reserves and found it economical to develop these formerly high-cost production areas.

This chain of events had an adverse impact on OPEC's plans to stabilize income from control of resource supply and pricing. In addition, certain member nations as part of their development plans proposed building large petrochemical complexes that would use as feedstocks the associated natural gas from crude petroleum production, which was simply being burned (flared). To do this, large capital investments would be necessary to build both the petrochemical plant facilities and an entire supporting infrastructure. As crude petroleum demand decreased and non-OPEC producers began displacing OPEC crude petroleum exports in industrialized nations, both the income and the associated natural gas began to become more limited as OPEC scaled back production.

During 1985-86, pressured by limited revenues from crude petroleum sales, several OPEC nations, notably Saudi Arabia, the largest OPEC producer, began to ignore OPEC production quotas and maximized crude petroleum output to regain income losses. The effect was a sudden surge in supply accompanied by a dramatic drop in prices (an approximate 50 percent decrease in the per barrel price of crude petroleum).[3] OPEC's revenues from crude petroleum exports declined from $133 billion during 1985, to $75 billion during 1986, or by 44 percent. However, the quantity of such exports increased by 17 percent, from around 13.8 million barrels per day during 1985, to around 16.2 million barrels per day during 1986. The increase was due primarily to a 62 percent increase in production by Saudi Arabia, OPEC's traditional swing producer. It was not until November of 1988 at a meeting of OPEC ministers in Vienna, Austria that some indication that restraints would again be followed that the price of crude petroleum began to improve.[4]

Of the 13 OPEC-member nations, Saudi Arabia, Venezuela, and Indonesia have actively pursued development plans, which center around the establishment of downstream industries that will utilize and hence add value to their natural resources. Hence, these nations are treated individually in this report. All three of these countries perceive this approach as an important alternative way to stabilize the flow of foreign income in addition to OPEC policies. Saudi Arabia, possessing around 25 percent of the world's proven crude petroleum reserves, has built an elaborate system for gathering and utilizing as feedstocks the associated natural gas which had no prior economic value. This inexpensive raw material source places this nation in very advantageous position in the production of products which are energy-intensive, such as petrochemicals, steel, and cement, in comparison to energy-importing nations like Japan. Venezuela,• because of its proximity to the North American markets, and its natural resource advantages, has also begun to invest in downstream energy-intensive industries. Indonesia, although not having extensive crude petroleum reserves, has abundant natural gas deposits. Indonesia's proximity to Japan and other Pacific Rim countries gives it an advantage in access to these markets as a supplier of downstream products produced from crude petroleum and natural gas.

Saudi Arabia

Saudi Arabia had estimated proved reserves of 170 billion barrels of crude petroleum and 146 trillion cubic feet of natural gas in 1988. Saudi

Saudi Arabia, a Country Study, ed. Richard F. Nyrop, 1985, U.S. Government Printing Office, Washington, pp. 331-345.

James P. Roscow, *800 Miles to Valdez: The Building of the Alaska Pipeline,* 1977, p. 9.

[3] Donald 0. Croll, "OPEC's Upsurge Boosts World Total," *Petroleum Economist,* January 1989, pp. 3-5.

• Ibid.

4-1

Arabian production of crude petroleum during 1983-85 decreased by 32 percent to 3.3 million barrels per day, then increased to 4.9 million barrels per_day in 1986. [5] Saudi crude petroleum production declined to about 4.0 million barrels per day in 1987. [8]

Most natural gas produced in Saudi Arabia is associated gas (i.e., natural gas recovered from crude oil production). Prior to the early 1970's, this associated gas was flared at the site; however, presently, the major portion of recovered associated natural gas is collected by an elaborate pipeline network and used as an energy source domestically, condensed to liquid natural gas (LNG) for export, or used as a feedstock for petrochemical production.

Beneficial Government Practices

The Saudi Government has traditionally provided domestically produced crude petroleum and petroleum products to all domestic users at a cost equal to the cost of production resulting in domestic prices for these products well below world prices.? Heavy fuel oil and diesel fuel, for example, are sold to Saudi industries for between 2-3 cents per liter, [8] compared with equivalent 1988 average U.S. prices of around 13.3 cents per liter for diesel fuel and 8.8 cents per liter of residual fuel oil sold to end users. [8]

The LNG exported is priced at the world price for LNG, however; the gas used within the country, either as an energy source or a chemical feedstock, is priced well below world market value.'[0] During 1984-88, this two-tiered pricing structure makes associated natural gas available to the Saudi economy at approximately 50 cents per thousand cubic feet" compared with an average U.S. price of around $3.00 per thousand cubic feet. [12]

Foreign Investment Policies

According to Article 1 of the Mining Code of the Kingdom of Saudi Arabia, the state "governs the exploitation of mineral wealth," however, petroleum, natural gas, and derivatives were excluded from this code. [13] Saudi Aramco, recently formed by the merger of Aramco and Petromin, now ranks as the largest single producer worldwide of crude petroleum and natural gas. Petromin was originally formed as the Saudi state-owned domestic petroleum producer in 1962 by King Saud.

Aramco, or the Arabian American Oil Company, was formed in 1944 by the U.S. companies Mobil, Chevron, Texaco, and Exxon. These companies were the sole owners of Aramco until December of 1972, when negotiations with the Saudi government were completed for 25 percent Saudi ownership of the company. In 1976 the Saudi Government became the sole owner of Aramco. As of 1988, the U.S. presence in the company was significantly reduced and the chairmanship was assumed by Ali Naimi, a Saudi national. [14] Presently approximately 76 percent of the company's supervisory positions, and 98 percent of all other positions, are filled by Saudi nationals. [15]

In other efforts to develop the nation's industrial base, the Saudi Government, through the Saudi Industrial Development Fund (SIDF) provides loans for up to 50 percent of fixed costs for projects, including those involving the major energy-consuming industries, provided that there is at least 25 percent Saudi ownership. [18] These loans carry only a nominal service fee (between 1 to 2 percent annually) and carry a 3- to 5-year term including a grace period of 1 to 5 years. In addition, the Government may also grant 5-year tax exemptions (tax holidays) for industrial ventures, excluding those in the petroleum or mineral sectors." Also included are land in industrial areas at nominal rents; duty-free imports of equipment and raw materials; and the Government will pay the full costs of training Saudi employees including wages. [18]

Saudi Arabia encourages direct foreign investment in the form of 50-50 joint venture companies. The foreign investor must first file for an investment license issued by the Foreign Capital Investment Committee (FCIC). [18] The FCIC is a committee of representatives from several Government ministries responsible for

• Compiled from official statistics of the U.S. Department of Energy.
• "The Slowdown Continues," *World Oil,* August 1988, p. 87.
[7] U.S. Department of State, "New Trade Act Report," Incoming Telegram, Jan. 22, 1989.
• Ibid.
• U.S. Department of Energy, *Monthly Energy Review,* October 1988, Washington, DC, 20585.
[10] Thomas R. Stauffer, "Energy-Intensive Industrialization in the Middle East," *Industry and Development,* No. 14, United Nations Industrial Development Organization, United Nations, New York, NY 1985, pp. 1-35.
" Ibid.
[12] Compiled from official statistics of the U.S. Department of Commerce.

[1]• Kingdom of Saudi Arabia, Ministry of Petroleum and Mineral Resources, Directorate General of Mineral Resources, ***Bulletin I: Mineral.***
[14] "The Slowdown Continues," *World Oil,* August 1988, p. 87.
[15] Ibid.
[10] U.S. Department of Commerce, *Investment Climate in Foreign Countries, vol* III, Washington, DC 20230, August 1985.
[17] ***Doing Business in Saudi Arabia,*** Price Waterhouse & Co., Riyadh, Saudi Arabia, 1979.
IS• U.S. Department of Commerce, *Investment Climate in Foreign Countries,* Vol. III, Washington, DC 20230, August 1985.
'• ***Legal Aspects of Doing Business in the Middle East, vol.*** 5, ed. Dennis Campbell, Kluwer Law and Taxation Publishers, Deventer, The Netherlands, 1986.

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economic development. Once the license is approved, an application for commercial registration of the venture can be submitted to the Commercial Registry office located where the principal place of business will be established. Accompanying this application must be a certification by an approved Saudi bank indicating that the foreign partner's share of the formation capital is on deposit at the bank. Saudi Arabia imposes no currency exchange control restrictions on repatriation of capital or profits, but regulations are in effect prohibiting the payment of funds to or from Israel and South Africa.

Once the proper license and registration are granted, joint-venture companies are given the same advantages in natural resource feedstock costs, low- or no-interest loans, and other Government programs as 100-percent Saudi companies.

Major Energy-Consuming Industries

Ammonia

Industry profile.—As stated previously, direct foreign investment is encouraged in the form of joint ventures with each partner holding a 50 percent equity share. Partners share access to low-priced feedstocks and other Government programs. The Saudi Arabian ammonia industry consists of 3 plants with a total capacity of about 1.2 million metric tons per year. Nearly all of the output from these plants is converted to urea for fertilizer. Recently plans have been announced to build a new world-scale export-oriented ammonia plant at Al Jubail.[20] The Italian engineering firm Technipetrol will build the ammonia plant along with four other downstream plants and the necessary infrastructure. The plant complex could be on-stream about 1991. One joint venture for ammonia production, namely Gulf Petrochemical Industries (GPIC), is a joint venture with the petrochemical industries of Kuwait, and the Government of Bahrain. The Taiwan Fertilizer Company is a joint-venture partner in Al-Jubail Fertilizer which operates a 600,000 metric ton per year plant.

Domestic market.—Trade and domestic consumption of ammonia is primarily in the form of urea. Saudi Arabia supplies urea fertilizers to African and Asian markets. Total ammonia exports in 1986 were 182,716 metric tons of nitrogen.[21] The downstream urea producers are the Saudi Arabian Fertilizer Company (SAFCO), a wholly owned Saudi firm, and the Al-Jubail Fertilizer Company (SAMAD), a joint venture with Taiwan Fertilizer. The combined capacity of these firms is about 930,000 metric tons per year. According to data published in an industry trade journal, Saudi Arabia nitrogen fertilizer production during 1987 was 440,000 metric tons. About 41 percent, or 181,700 metric tons, were consumed by Saudi agricultural activity during this period, the remainder of the nation's output was exported principally to Asian markets. U.S. imports of Saudi ammonia were minimal, valued at about $4 million in 1988 and accounting for less than one percent of apparent U.S. consumption.

Effects on production costs.—In an earlier investigation, the Commission estimated that the cost of natural gas to Saudi Arabian ammonia producers conferred a significant cost-of-production advantage compared with such costs for U.S. producers.[22] From netback calculations starting with the delivered price of Saudi ammonia and using the costs of transportation and customs duties, it was determined that Saudi ammonia production costs were between $45-S65 per short ton compared with similar costs of between S92-$170 per ton for U.S. producers. A recent trade journal article listed a production cost figure for the top producer in the Middle East of $73 per metric ton during the third quarter of 1988,[23] (or $66 per short ton) which is in agreement with the $65 figure published in the Commission's 1985 report.

Effects on competitiveness.—The differences in production costs between U.S. and Saudi ammonia producers would be sufficient to make Saudi ammonia imports equally price competitive at the U.S. Gulf Coast with domestically produced ammonia, and make U.S. ammonia somewhat less price competitive in Western European markets, and noncompetitive in Japan and the Far East when transportation costs are also included.[24] Currently ammonia shipping cost ranges from $30 to $50 per ton[25] from the U.S. Gulf Coast to Western Europe.

Effects on resource allocation.—Natural gas feedstock for production of ammonia represents from 27 percent to 29 percent of Saudi Arabian production costs. If this natural gas were priced at the current world market level, feedstock costs would then represent about 68 percent of ammonia production costs significantly reducing the competitiveness of Saudi ammonia in world

[20] "Saudi Arabia Studies New Ammonia Plant at Jubail," *European Chemical News,* Feb. 29, 1988, p. 25.
[a*] "Saudi Arabia: Exported 246,100 Metric Tons N of Urea in 1987 vs. 373,800 Metric Tons N in 1986," *Nitrogen,* April 1988, p. 11.
[22] U.S. International Trade Commission, ***Potential Effects of Foreign Governments' Policies of Pricing Natural Resources,*** USITC Publication 1996, May 1985, pp. 74-78.
[23] "Tight Ammonia Supply Augurs Well for European Producers," *European Chemical News,* Feb. 27, 1989, p. 48.
[2] U.S. International Trade Commission, ***Potential Effects of Foreign Governments' Policies of Pricing Natural Resources,*** USITC Publication 1996, May 1985, pp. 74-78.
[28] "Freight Rate Hikes Show Lively Market," *European Chemical News,* Apr. 2, 1989, p. 8.

markets 2[8] The only alternative use for this resource would be as flare gas.

Ethylene

Industry profile.—As of January 1988, total ethylene capacity in Saudi Arabia was 2.0 million metric tons per year. Saudi Petrochemical with 760,000 metric tons per year capacity is a 50-50 joint venture with Shell Oil as the Saudi Arabian Basic Industries Corporation (Sabic) partner, Saudi Yanbu Petrochemical (YANPET) with 560,000 metric tons per year capacity is a Sabic 50-50 joint venture with Mobil Oil, The third ethylene facility (Petrokemya) is fully owned by Sabic and has a capacity of 650,000 metric tons per year. Petrokemya has begun basic engineering plans for a new naphtha-based ethylene plant with a proposed capacity of 500,000 metric tons per year of ethylene, 200,000 tons per year of propylene, and 100,000 tons per year of benzene.[27] Yanpet, the Sabic-Mobil Oil joint venture, also plans to build a naphtha-based ethylene plant at Yanbu."

Domestic market..7-All of the ethylene produced in Saudi Arabia is consumed by downstream products, such as ethylene dichloride, ethanol, ethylene glycol, and polyethylene. According to some industry sources, during 1988 Sabic ventures produced about 1.1 million metric tons of high density polyethylene (HDPE) and linear low density polyethylene (LLDPE), as well as 200,000 metric tons of polyvinyl chloride (PVC).

Sabic and its subsidiaries are export-oriented firms due to a limited domestic demand for these products. Most of Sabic's petrochemical output is exported to Western Europe and the Far East; however, 1,000 metric tons of LLDPE and HDPE valued at less than S1 million were exported to the United States in 1988. This represents a minimal share of the overall U.S. market, which is valued at more than S5 billion.

Effects on production costs.—The Sabic ethylene plants now operating use natural gas as the feedstock. This natural gas supplied by Petromin is sold to these petrochemical manufacturers at a nominal cost of 50 cents per thousand cubic feet since the only alternative use for the gas would be flaring this resource at the wellhead.

The Commission estimated production costs to the Saudi ethylene industry as follows (in cents per pound of ethylene produced):

Feedstock and fuel	1	- 3
Utilities	1	- 2
Labor	1	- 2
Maintenance	3	- 5
Overhead	1	- 3
Other (insurance, taxes, etc.)'	2	- 4
Total production costs	7	-19

' Tax holiday of 5 years from date of start of operations.

Saudi feedstock costs represent approximately 14 percent to 16 percent of total production costs. For U.S. producers manufacturing ethylene from ethane by steam-cracking, feedstock costs represent about 36 percent of total production costs."

Effects on competitiveness.—Competition between Saudi ethylene producers and other world producers occurs in the downstream derivatives markets. Transportation cost varies depending on the nature of the ethylene derivatives shipped. In general, the natural gas price advantage enjoyed by the Saudi producers is offset by transportation and distribution cost by varying amounts in world markets. As with ammonia, when these other charges are included Saudi olefin producers would have price advantages in Western European and Asian markets but little additional price advantage in U.S. markets compared with U.S. producers.

Effects on resource allocation.—If the natural gas supplied to Saudi ethylene producers by Petromin were priced at world levels, the feedstock costs as a percentage of total production costs would be more similar to U.S. prices for such an application. However, with infrastructure uses for natural gas increasing (e.g., water desalination and electric power generation), the availability of this resource for further petrochemical development is becoming limited. The two newest ethylene projects under consideration in Saudi Arabia will use naphtha feedstocks instead of natural gas, which will make the downstream derivatives produced from the ethylene manufactured by these new plants more costly and, hence, less price competitive in world markets.

Refined petroleum products

Industry profile.—Refining capacity in Saudi Arabia during 1984-88 has generally increased as illustrated by the following tabulation:

"Tight Ammonia Supply Augurs Well for European Producers," *European Chemical News,* Feb. 27, 1989, p. 50.

[27] "Saudi Arabia in Major Ethylene Capacity Push," *European Chemical News, Dec. 7,* 1987, p. 32.

" "Kellogg Wins Yanpet 2 Naphtha Cracker Order," *European Chemical News,* Apr. 3, 1989, p. 25.

" Walter Vergara and Donald Brown, *The New Face of the World Petrochemical Sector, Implications for Developing Countries. World* Bank Technical Paper No. 84, 1988, p. 80.

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Year	Refining capacity' (1,000 barrels per day crude petroleum)
1984	860
1985	840
1986	1,115
1987	1,125
1988	1,375

Source: *international Petroleum Encyclopedia,* 1984-85, and U.S. Department of Energy, *International Energy Annual,* 1985-88.

Of the seven refineries located in Saudi Arabia, two are joint venture operations. Mobil Oil and Shell Oil are the foreign partners in these joint ventures. Joint venture capacity accounted for 500,000 barrels per day crude petroleum throughput or about 36 percent of total refinery capacity during 1988. These joint venture plants are predominately export-oriented.[30]

Domestic market.—Table 4-1 shows all the publicly available information on the production, imports, exports, and apparent consumption of refined petroleum products in Saudi Arabia.

Saudi Arabian production of refined petroleum products generally increased over 1984-88 from 1.0 million barrels per day to 1.4 million barrels per day refinery output. Saudi apparent consumption increased from 552,000 barrels per day during 1984 to an estimated 650,000 barrels per day during 1988. The majority of imports represented petroleum products output from Saudi-owned refineries in the shared (with Kuwait) neutral zone, while most Saudi exports were shipped mainly to other Persian Gulf nations, certain developing nations in Africa and Western Europe. U.S. imports of petroleum products from Saudi Arabia were valued at $524 million in 1988, accounting for less than 5 percent of total imports and less than 1 percent of U.S. apparent consumption.

Effects and production costs.—No specific pricing information is available for the crude petroleum used as feedstock by Saudi refineries; however, a recent U.S. Department of State telegram stated that the petroleum products are sold at cost, resulting in Saudi domestic prices for these products at levels well below world market prices.[31]

Effects on competitiveness.—Although the feedstock acquisition costs for Saudi producers and their joint venture partners are reportedly well below the equivalent world market costs, transportation costs outside of the markets currently serviced by the Saudi industry would probably offset any major feedstock cost advantages. Hence, Saudi products directed toward the United States would not have a significant price advantage compared with U.S.-produced refinery products.

Effects on resource allocation.—In USITC publication 1696, it was stated that the principal motives directing Saudi resource allocations are not dependent on returns of income from refined petroleum products, but rather on the furthering of industrial development within the country. However, with the world's lowest production costs for crude petroleum (approximately $3.00 per barrel) it is likely that Saudi-produced refined petroleum products would be equivalently price competitive in the international marketplace regardless of domestic pricing policies.

Venezuela

Venezuela had estimated proved reserves of 58 billion barrels of crude petroleum reserves and 102 trillion cubic feet of natural gas at yearend 1988. The exploitation of all mineral wealth in Venezuela is the exclusive right of the National Government. The Venezuelan Government nationalized its entire energy industry on January 1, 1976, placing control of these operations under the state-owned firm Petroleos de Venezuela (PDV).[32] In addition to crude petroleum and natural gas, Venezuela also has estimated proven coal reserves of 509 million metric tons, with an estimated total reserve of around 9.2 billion metric tons of coal. Developments are presently underway to exploit this resource.

g° *Platt's Oilgram News,* Mar. 14, 1985, p. 3.

[31] U.S. Department of State, "New Trade Act Report," Jan. 22, 1989, Riyadh, Saudi Arabia.

[22] U.S. Department of *Energy, Energy Industries Abroad, September 1981,* pp. 51-56.

Table 4-1
Refined petroleum products: Saudi Arabia production, imports, exports, and apparent consumption, 1984-88

(In thousands of barrels per day)

Year	Production	Imports	Exports	Apparent consumption'
1984	1,004	35	487	552
1985	995	36	327	704
1986	1,360	12	732	640
1987[2]	1,375	10	735	650
1988[2]	1,375	10	735	650

includes products in bunkers.

[2] Estimated.

Source: Compiled from the official statistics of the U.S. Department of Energy and the American Petroleum Institute.

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Beneficial Government Practices

The Venezuelan Government imposes price controls on energy products used domestically.[33] The nation- widely - promotes its low-cost hydroelectric, thermoelectric energy, and raw material feedstocks.[34] Foreign investors also benefit from these cheap raw materials inputs and energy costs.[36]

Foreign Investment Policies

Venezuela has historically sought foreign investment to assist in developing its energy-intensive industries. The Government has tried to reduce the dependence on crude petroleum and other energy raw materials exports by a program of domestic refinery and petrochemical plant development, as well as direct investments in refineries in the United States and Western Europe. These downstream industries provide a guaranteed outlet for a portion of Venezuela's energy products and add value to these products. PDV's subsidiary petrochemical company, Pequiven, already is involved in joint-venture operations with foreign companies such as Veba (West Germany), CDF Chemie (France), Mitsui (Japan), ENI (Italy), and the U.S. companies Dow, DuPont, and Olin. Recently Pequiven announced several new projects with foreign investors. Pequiven and Veba agreed to undertake a feasibility study for a plant with annual production of 250,000 metric tons of propylene and 70,000 metric tons of polypropylene.[3]e Each partner will hold 49-percent ownership with the remainder made available through the stock market.[37] Pequiven and Ecofuel, a subsidiary of Italy's ENI, formed the company, Super Octanos SA, to build a methyl tertiary-butyl ether (MTBE) plant with an annual production capacity of 500,000 metric tons costing $266 million.[38] Partial. financing for this project was provided by a total of 22 banks arranged by the U.S. banking firm Manufacturers Hanover Trust for a total of $166 znillion.[36] Norsk Hydro (Norway), the world's largest producer of fertilizers, signed an agreement with Pequiven for a 500,000-metric-ton-per-year natural-gas-based ammonia plant to be built at Jose near Puerto La Cruz, Venezuela." The $200 million venture will be 49-percent owned by Pequiven, 30 percent by Norsk Hydro, 15-percent by a group of Venezuelan private investors, and 6 percent to be sold on the Caracas stock exchange. In a four-party joint venture to build a polypropylene plant with an estimated annual capacity of 70,000 metric tons, Pequiven, Misui of Japan, and two privately owned Venezuelan companies, Grupo Zuliano and Promotora Venoca, will invest a total of $207 million at the El Tablazo petrochemical complex.[41] Ownership will be 49.4 percent by Pequiven, 20.2 percent Mitsui, and 15.2 percent each for the private Venezuelan firms." Financing will include an $85 million loan provided by Banque Paribas ($38 million) and the International Finance Corporation ($47 million), a subsidiary of the World Bank."

In addition to expansions in the Venezuelan petrochemical industry by both national and joint venture investments, another PDV subsidiary, Carbozulia, with foreign investors, has begun development of coal deposits in the western section of the country." In one project that will produce about 500,000 metric tons per year, the foreign investors are Arco Coal Co. of Venezuela, a subsidiary of the U.S. firm Arco, and Agip Carbone, a subsidiary of Italy's ENI.[46] Another coal-mining venture is in the planning and negotiation stages involving a Venezuelan Government-owned company, Carbones del Suroeste CA, and a group of Spanish investors." The foreign interest plans to invest about $28 million in a mine that will produce up to 700,000 metric tons per year of coal that will be used to produce coke for the Venezuelan metals industries.

Venezuela's domestic petrochemical industry is under the control of PDV. In addition to independently owning and operating several petrochemical and fertilizer plants, PDV is involved in 13 domestic joint ventures where state-owned interests range from 11.4 percent to 73 percent.[47] PDV's 100-percent-owned plants consist, in part, of olefins (480,000 metric tons per year), ammonia (500,000 metric tons per year), and urea (360,000 metric tons per year)."

The Venezuelan Government authority for the registration and control of most foreign investments is the Superintendency of Foreign Investments (SIEX); however, foreign investments and contracts in the petroleum, natural gas, and related industries are regulated

[33] U.S. Department of State, "New Trade Act Report: Venezuela," Dec. 5, 1988.
[a4] Ibid. and Juan F. Rodriguez, "Venezuela Ventures On," *Countertrade and Barter,* June/July 1988, pp. 28-34.
[3°] *U.S. Department* of State, "New Trade Act Report: Venezuela," Dec. 5, 1988.
" "Venezuela-Expansion of Joint Venture Projects," *Petroleum Economist,* November 1988, p. 377.
[37] Ibid.
" Ibid.
" "High Octane Finance for Lead Free Fuel," *Trade Finance,* December 1988, pp 28-29.
[4°] "Hydro in Venezuelan Ammonia Joint Venture," *European Chemical News,* Mar. 28, 1988, p. 18.
[41] "Venezuela-Expansion of Joint Venture Projects," *Petroleum Economist,* November 1988, p. 377.
[42] Ibid.
[43] Ibid.
[44] Juan F. Rodriguez, "Venezuela Ventures On," *Countertrade and Barter,* June/July 1988, pp. 28-34.
[46] Ibid.
[43] Ibid.
[47] "Venezuela-Expansion of Joint Venture Projects," *Petroleum Economist,* November 1988, p. 377.
" "A Blazing Market: Latin America's Chemical Industry Boom," *Chemical Week,* Nov. 16, 1988, pp. 36-48.

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by the Ministry of Energy and Mines.[4] There are three types of companies that operate in Venezuela, classified as foreign companies (49 percent or less of the assets are controlled by Venezuelan nationals), mixed companies (between 80 to 51 percent of the assets are controlled by Venezuelan nationals), and, national companies (with more than 80 percent of the companies' assets controlled by Venezuelan investors)." As a member of the Andean Pact," Venezuela abides by its directive that stipulates that to benefit from reduced tariffs on goods traded between me mber nations, a firm must be no less than percent owned by nationals of a member country. This requirement excludes Venezuelan registered companies classified as foreign and could be considered as a barrier to certain foreign investment.

The Venezuelan Government formerly maintained a multi-tiered currency exchange rate structure for the Bolivar (Bs). Foreign investment, except in an industry where 80 percent of the output was to be exported, was made at a controlled rate of Bs 14.50 per S 1, while repatriation of profits used the free market rate which averaged around Bs 33.00 per $1 during 1988." The Government recently modified certain of these exchange regulations in an effort to attract more foreign venture capital. For example, nonpetroleum exporters no longer are required to change their foreign currencies at the controlled rate of Bs 14.50 per $1, but can use the free market rate." The new administration of President Carlos Andres Perez is expected to be the dominant force in setting the country's petroleum and investment policies." President Perez announced that a single, floating exchange rate for the bolivar will be established abolishing the official rate which was applied to most international commercial and financial transactions."

[40] *Doing Business in Venezuela,* 1985.
[60] Ibid.
[61] The Cartagena Agreement signed by Bolivia, Chile, Ecuador, Peru, and Venezuela established the Andean Pact nations. The Andean Pact was formed to stimulate the economic development of these regions by reduction or elimination of tariffs for products traded among member nations, and to plan, develop and rationalize industries.
" "A Blazing Market: Latin America's Chemical Industry Boom," *Chemical Week,* Nov. 16, 1988, pp. 36-88.
"Payments News-Venezuela," *Trade Finance,* December 1988, p. 14.
[64] Roger Vielvoye, "Watching the World, Venezuela's New Regime," *Oil and Gas Journal,* Feb. 6, 1989, p. 30.

Major Energy-Consuming Industries

Ammonia, urea, and other nitrogen fertilizers

Industry profile.—At present, the Venezuelan ammonia industry consists of plants at the Zulia complex and the Moron complex, which are wholly owned subsidiaries 'of Pequiven. Most of the ammonia produced from natural gas feedstock is converted to urea and other nitrogen fertilizers for domestic consumption and export. Pequiven, in a joint venture with the Norwegian firm, Norsk Hydro, the world's largest producer of fertilizers, will build an export-oriented ammonia plant at Jose', near Puerto La Cruz. The plant will have a capacity of about 500,000 metric tons per year of ammonia and will use natural gas feedstocks obtained from an adjacent natural gas liquids separation plant owned and operated by a subsidiary of PDVSA, Corpoven. The ammonia plant will have access to the existing infrastructure to ship ammonia to foreign markets. Pequiven is also planning a wholly-owned 495,000 metric ton per year ammonia plant at Moron. The ammonia produced at this facility would be used in downstream urea production at the Moron complex.

Urea and other nitrogen fertilizer capacity currently operating in Venezuela is also wholly owned by Pequiven subsidiaries. Pequiven's total urea production capacity currently amounts to 1.1 million metric tons per year."

Domestic market.—The following table shows the Venezuelan domestic consumption and trade of nitrogen fertilizers during 1980-87:

[88] "Payments News-Venezuela," *Trade Finance,* March 1989, p. 13.
[88] U.S. Department of State, "Industrial Outlook for Petroleum and Natural Gas, Venezuela, 1987," July 19, 1988, Caracas, Venezuela.

Table 4-2
Nitrogen fertilizers: Venezuelan production, Imports, exports, and apparent consumption, 1984-87
(1,000 metric tons nitrogen)

Year	Production	Imports	Exports	Apparent consumption
1984	260	5	140	125
1985	200	15	70	145
1986	340	60	155	245
1987	310	50	120	240

Source: Compiled from Food and Agricultural Organization of the United Nations, *Current World Fertilizer Situation and Outlook 1986/87-1992/93,* Rome, Italy, 1988, and from The Venezuelan Fertilizer Industry: Jam Tomorrow?,' *Fertilizer international,* No. 272, April 1989, pp. 28-31.

Venezuelan production of fertilizers increased from 140,000 metric tons of nitrogen in 1980, to 310,000 metric tons of nitrogen in 1987. Apparent consumption -also increased during this period from 110,000 metric tons of nitrogen to 240,000 metric tons of nitrogen. Venezuelan imports of nitrogen fertilizers consist of certain special compounded fertilizers not produced domestically. The major export markets for Venezuelan nitrogen

fertilizers are Argentina, Colombia, and Costa Rica. Venezuela does export some fertilizer to the United States, Western Europe,[57] and the Far East. U.S. imports of Venezuelan urea and anhydrous ammonia in 1988 were valued at nearly $16 million, representing 5 percent of total imports and less than 1 percent of U.S. apparent consumption.

Effects on production costs.—No definitive listing of the Venezuelan production cost factors for ammonia, urea, or other nitrogen fertilizers are publicly available. However, from data on Venezuelan industrial natural gas prices compiled by the U.S. Embassy in Caracas during 1987,[68] the industrial domestic price of natural gas was Bs 4.25 per thousand cubic feet, or approximately $0.14 per thousand cubic feet.[59] For comparison, the average industrial price of U.S. natural gas during 1987 was $2.97 per thousand cubic feet. For a U.S.-based ammonia producer, natural feedstock represents approximately 70 percent of the cost of production.

Effects on competitiveness.—Although Venezuelan producers may enjoy lower natural gas feedstock costs compared with U.S. and world prices for this resource, according to one source, Pequiven has been disadvantaged because of high freight rates. According to the official statistics of the U.S. Department of Commerce, the unit value of Venezuelan urea imports during 1988 was $108.90 per short ton, compared with the average unit value of $96.71 per short ton for imports of this chemical from all sources. The current average U.S. price reported by one trade journal for 1988 was $130 per ton, prilled, f.o.b. Gulf Coast.[80] Commerce statistics for imports of Venezuelan ammonia (anhydrous) during 1988 show a unit value of $76.10 per short ton. In a post-hearing brief to the Commission filed on behalf of the Ad Hoc Committee of Domestic Nitrogen Producers, the monthly average spot prices (U.S. Gulf Barge price) for anhydrous ammonia were a low of $82-85 per short ton during May 1988, and a high of $126-130 per short ton during December of that year.[61] The unit values for U.S. imports of Venezuelan anhydrous ammonia and urea during 1988 were lower than the comparable U.S. spot prices for these products, indicating that even with transportation costs added, Venezuelan product would be price-competitive with the respective U.S. chemicals.

Effects on resource allocation.—If the price of natural gas used by Venezuelan industrial consumers were allowed to rise to world price levels, the downstream products manufactured from this resource would be less price competitive in U.S. and other world markets. The Venezuelan Government encourages the substitution of natural gas for refined crude petroleum products and has financed infrastructure development to exploit the large gasfields located in the eastern part of the country.[62]

Olefins

Industry profile.—The production of ethylene and propylene in Venezuela is presently confined to one petrochemical complex, Zulia (or El Tablazo), in the northwestern section of the country adjacent to the Lake Maracaibo petroleum fields. Another complex is under development at Jose, in the Eastern state of Anzoategui, the site of an extensive natural gas field. All of the ethylene and propylene production capacity currently operational is owned by Pequiven and is principally based on natural gas feedstocks.[83] Pequiven has installed capacity at Zulia for production for 155,000 metric tons per year of ethylene, and 46,000 metric tons per year of propylene." These olefins plants serve the downstream derivatives plants also located at the Zulia complex. Venezuela has plans to double the olefins capacity at Zulia and add about 250,000 metric tons per year of propylene capacity at the developing Jose complex. This additional capacity will be a mixture of 100 percent Pequiven ownership as well as joint venture ownership of certain plants.es

[57] In 1988, the EC Commission found that imports of Venezuelan urea were being dumped and issued an antidumping order.
" U.S. Department of State, "Industrial Outlook for Petroleum and Natural Gas, Venezuela, 1987," July 19, 1988, Caracas, Venezuela, app. 22.
" Ibid.
[00] "Urea," *Chemical Profiles,* Jan. 1, 1989.
[0'] Posthearing brief filed on May 2, 1989, by Ms. Valerie A. Slater, Esq., Akin, Gump, Strauss, Hauer, and Feld, Attorneys at Law, on behalf of the Ad Hoc Committee of Domestic Nitrogen Producers, p. 3.
U.S. Department of States, "Industrial Outlook for Petroleum and Natural Gas, Venezuela, 1987," July 19, 1988, Caracas, Venezuela, p. 18.
" "Venezuela: Expansion of Joint Venture Projects," *Petroleum Economist,* November 1988, p. 377.
[04] U.S. Department of States, "Industrial Outlook for Petroleum and Natural Gas, Venezuela, 1987," July 19, 1988, Caracas, Venezuela, app. 12.
[55] "Venezuela in PE Venture, Plans MTBE, Styrene Units," *European Chemical News,* Oct. 17, 1988, p. 29.

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Domestic market.—All of the olefins produced in the Zulia complex are used to manufacture downstream derivatives such as vinyl chloridemonomer, polyvinyl chloride, and polypropylene. Table 4-3 shows the production of ethylene and propylene during 1984-87.

Production of ethylene increased from 109,100 metric tons in 1983, to 152,300 metric tons in 1987, or by 40 percent. Propylene production increased from 36,000 metric tons in 1983, to 66,700 metric tons in 1987, or by 85 percent. Such strong growth coupled with a 2.7 percent annual growth- -in population and proximity to the U.S. market adds confidence to the predictions for continued growth in the Venezuelan petrochemical sector, and the plans to expand and diversify product lines through joint venture agreements in order to satisfy Venezuelan domestic demand and serve export markets with downstream derivatives.[e8] Much of the planned olefin production will also be consumed domestically.[87] Currently, however, Venezuelan olefin and downstream polymer production are not a factor in any export markets.

Effects on production costs.—No enumerated production cost structure for the Venezuelan industry is available. However, since production technology for olefins is fairly similar worldwide, with feedstock costs representing about 36 percent of production costs for ethylene for U.S. producers, the significant price differential between the price paid for natural gas by U.S. industrial consumers compared with the price for this product in Venezuela as described earlier for the ammonia industry would reduce the Venezuelan production costs for this energy-intensive industry.

Effects on competitiveness. —Pequiven's transfer prices for olefins to its downstream plants are not available. However, it can be assumed that such costs for a similarly integrated U.S. producer would be substantially greater given the natural gas price advantages of Venezuelan industrial consumers. It can also be assumed that the cost savings enjoyed by downstream olefin derivatives producers in Venezuela would be passed through to domestic finished products manufacturers, and, consequently, give these end products a certain price advantage in world markets compared with higher-cost producers elsewhere in the world.

Effects on resource allocations.—Venezuela considers the natural-gas-based petrochemical sector as the second-most-important investment sector for the state energy monopoly, PDV.[68] PDV controls the domestic market for natural gas and supplies this natural resource to its own subsidiaries as well as to privately and jointly owned commercial users. The plans for developing export-oriented petrochemical plants using Venezuela's extensive non-associated natural gas field in the eastern section of the country may indicate that the anticipated foreign currency gains from export sales of downstream derivatives of these petrochemicals are of higher priority than allowing the domestic price of natural gas to increase to world price levels for those commodities. As industrial expansion continues, the need to divert more natural gas to support infrastructural improvements may result in increased prices for these reallocated resources.

Refined petroleum products

Industry profile.—The state-owned firm, PDV, solely owns and control all refining operations in Venezuela. PDV also is involved in joint ventures and has other holdings outside of Venezuela. As of January 1, • 1988, Venezuela had six domestic crude petroleum refineries with a total capacity of 1.2 million barrels of crude petroleum per day. These refineries are owned and operated by PDV, the state energy monopoly. In addition to this domestic capacity, PDV has both joint-venture capacity and full ownership of refineries in the United States, West Germany, Sweden, and Belgium which represents an additional processing capacity for 450,000 barrels per day of Venezuelan crude petroleum.ee If permitted to continue such foreign joint-venture projects, PDV plans to increase its foreign refinery capacity to 700,000 barrels per day by agreements mainly with refiners in the United States."

[oo] "A Blazing Market: Latin America's Chemical Industry Boom," *Chemical Week,* Nov. 16, 1988, p. 42.
[07] Ibid.
" "A Blazing Market: Latin America's Chemical Industry Boom," *Chemical Week,* Nov. 16, 1988, p. 42.
[o°] "Venezuela: Expansion of Joint Venture Projects," *Petroleum Economist,* November 1988, p. 77.
" Ibid.

Table 4-3
Production of ethylene and propylene by Pequiven, 198447

(1,000 metric tons)

Product	*1984*	*1985*	*1986*	*1987*
Ethylene	133.5	141.1	171.0	152.3
Propylene	46.4	48.1	60.8	66.7

Source: U.S. Department of States, "Industrial Outlook for Petroleum and Natural Gas, Venezuela, 1987," Caracas, Venezuela, July 19, 1988.

Domestic market.—Venezuela supplies refined petroleum products to Latin American and Caribbean markets as well as to the United States, Western Europe, and the Far East. Table 4-4 shows - the production, domestic consumption, and trade of Venezuelan refined petroleum products.

Venezuelan production of refined petroleum products generally decreased during 1984-87, except during 1984-85. Apparent consumption of these products followed a trend similar to production, increasing from 416,000 barrels per day in 1984, to 444,0004,arrels per day in 1985, before decreasing to an estimated 343,000 barrels per day in 1987. Venezuelan exports of refined petroleum products increased from 502,000 barrels per day in 1984, to 553,000 barrels per day in 1986; but decreased to an estimated 485,000 barrels per day in 1987. Although Venezuelan production, consumption, and exports of these refined products decreased during 1986-87, exports of crude petroleum increased. Venezuela does not import refined petroleum products.

According to a report prepared by the U.S. Embassy in Caracas, the United States is Venezuela's largest export market, accounting for 115 million barrels of Venezuelan refined products were valued at S2 billion during 1987, or 65 percent of Venezuela's exports of these products during this period.[71] In 1988, U.S. imports of Venezuelan petroleum products increased to a value of S2.1 billion and accounted for more than 18 percent of total imports of U.S. petroleum products and nearly 2 percent of U.S. apparent consumption. Other major markets by percent of total exports included Central America (including Puerto Rico) 11 percent; South America 9 percent; and the EC 8 percent.[72] Japan accounted for all Asian exports during 1987 which amounted to 223,000 barrels of such products.[73]

[2'] U.S. Department of State, "Industrial Outlook for Petroleum and Natural Gas, Venezuela, 1987," July 19, 1988, Caracas, Venezuela, app. 19.
[72] Ibid.
[73] Ibid.

As of December 31, 1987, there were a total of 20 Venezuelan flag tankers with a total 836,600 dead weight tons (DWT).[74] Nineteen of the twenty tankers were owned and operated by subsidiaries of PDV, the state energy monopoly.

Effects on production costs.—No information is available on the cost structure of the refineries owned and operated by PDV in Venezuela. However, it is known that domestic prices for refined products are well below world levels. The following tabulation shows prices in Venezuela for certain refined products in 1986:[75]

Refined product	Price (BsInter)
Gasoline (95 octane)	1.50
Aviation gasoline	1.85
Jet kerosene	1.85
Auto diesel	.35
Industrial diesel	.28
Heavy fuel oil	.20

Effects on competitiveness.—Venezuela markets its exports of refined petroleum products at prices which are similar to the world prices for such products in most developed nations. Agreements with Central American and Caribbean countries (the San Jose Accord, renewed in August 1987) commits Venezuela to provide petroleum and products at market rates, but with the provision that 20 percent of the sale price is returned to these countries as a loan.[78] Under this agreement, the credits are denominated in U.S. dollars, but may be used only to purchase goods and services of Venezuelan origin.

Effects on resource allocation.—Since exports of refined products do not count against OPEC crude petroleum production quotas, increased diversion of crude petroleum to domestic refineries would seem a reasonable strategy; however, refined products need distribution outlets in foreign markets which could limit export sales to developed nations with ample domestic refining capacity. To offset such a

[24] Ibid.
[76] Ibid., app. 22.
[22] Ibid., p. 35.

Table 4-4
Refined petroleum products: Venezuelan production, Imports, exports, and domestic consumption, 1984-87

(1,000 barrels per day)

Year	Production	imports	Exports	Apparent consumption'
1984	918	0	502	416
1985	989	0	545	444
1986	937	0	553	384
- 1987	[2]828	0	[2]485	[2]343

' Includes bunkers.
[2] Preliminary estimates from *Venezuela: Continued Drive Downstream,* *Petroleum Economist,* April 1988, p. 122.
Source: Compiled from the official statistics of the U.S. Department of Energy, except where noted.

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problem, Venezuela has invested in foreign refining capacity in the United States and Western Europe. Venezuela is sole owner of the Champlin Refining Co., and supplies its 165,000-barrel-per-day refinery in Corpus Christi, TX with crude petroleum which does not count against its OPEC quota. The transfer costs of such crude petroleum feedstocks are not known; however, other operating costs would be similar to those of other U.S. refinery operations.

Indonesia

Indonesia is the only Asian member of OPEC. The country's major natural resources are crude petroleum, natural gas, and coal. Indonesia's proven crude petroleum reserves were estimated to be around 8.3 billion barrels at the end of 1988. These reserves accounted for about 39 percent of all crude petroleum reserves in the Asia-Pacific area (excluding the U.S.S.R. and China) during this period." Indonesia's estimated proven natural gas reserves in 1988 were 83.6 trillion cubic feet.

Primary responsibility for Indonesia's energy industries rests with the Government's Department of Mines and Energy." The head of this department is also head of Indonesia's delegation to OPEC. Within this organization, the Directorate General of Oil and Gas (MIGAS) regulates all phases of the petroleum industry." In 1971, Law No. 8, "The Pertamina Law," revised the charter for Pertamina, the state-owned petroleum and gas company. Pertamina is managed by a president-director, and a board of six other directors, each with specific responsibilities.

Beneficial Government Practices

The Indonesian Government has a multitiered pricing structure for crude petroleum and natural gas. According to a petroleum study done in 1987 by the U.S. Embassy in Jakarta, there were three prices in effect for crude petroleum in Indonesia prior to December 1986.[80] These prices were the Government selling price; the Pertamina export price, and the "Agreed Price." This latter price was only a method of settling accounts between foreign contractors and Pertamina. However, the reintroduction of OPEC's official selling prices resulted in the elimination of differences between the three earlier prices during 1987; the official Government selling price then became the price for all transactions. The domestic fuel price advantage declined steadily during 1984-86. Two principal reasons were given for this trend, namely the Government's energy policies deemphasizing domestic consumption of crude petroleum in favor of natural gas, and the 50—percent decrease in world crude petroleum prices in 1986 due to the worldwide surplus of this product. However, the issue of pricing is complex, since to allow domestic prices to rise would significantly diminish the feedstock cost advantages of petrochemical producers in Indonesia.

To promote the growth of the industrial sector, and to popularize the use of natural gas in lieu of products derived from crude petroleum, the Indonesian Government controls the price of domestically consumed natural gas. In Ministerial Decree 0579, issued on June 23, 1984, the Minister of Mines and Energy established a ceiling price for natural gas consumed domestically by industrial energy users.[81] The following categories were established:[82]

Krakataw Steel	$2.00 per million Btu's for gas used as fuel for electricity generation. $0.65 per million Btu's for gas used as a raw material In the production process.
Fertilizer plants	$1.00 per million Btu's.
Other industry	$3.00 per million Btu's.

The $1.00 per million Btu price is reported to be the same price as gas exported as LNG.

Foreign Investment Policies

The only methods of foreign investment in the Indonesian petroleum sector are by joint venture or production contracts. Under Indonesian law, the distribution of goods and services in Indonesia can only be undertaken by Indonesian citizens or by companies wholly owned by Indonesian nationals.[83] However, foreign-owned companies are permitted to sell their products to other companies that use these products for such purposes as spare parts or raw feedstock materials. In an effort to attract more foreign investment, the Government has announced modifications to previous policies regarding joint ventures. In a joint venture where 51 percent is owned by Indonesian nationals, or where 45 percent is Indonesian-owned and at least 20 percent of the total stock is sold on the domestic stock market, the venture receives treatment as a domestic company and have access to natural resource requirements at the same price as domestic companies. This allows the company to distribute its own products and make investments in certain other domestic firms. Also, a company that exports .65 percent of its total production is permitted to import any materials regardless of the availability of similar domestic products.

rf "Worldwide Report," *Oil & Gas Journal,* Dec. 26, 1988.
[79] U.S. Department of State Telegram, The Petroleum Report, Indonesia, Embassy of the United States, July 1987, Jakarta, Indonesia.
[79] Ibid.
[80] Ibid.

[81] Ibid., pp. 56-57.
[82] Ibid.
[83] *Doing Business in Indonesia,* Price Waterhouse, publishers, Jakarta, Indonesia, 1986, p. 23.

Prior ownership divestiture limitations have also been changed. Under the new regulations, a foreign partner is required to convert its majority share of ownership to Indonesian ownership within 15 years as compared with the former 10-year limitation.[94] Indonesia has no restriction on repatriation of capital and is committed to a free foreign exchange system."

Because of the importance of natural resources to Indonesia's economy, the exploration and development of these resources in order to increase production is of vital concern. To accomplish this goal, the Government encourages foreign investment. Such investments are generally in the form of contracts whereby each partner shares the total production of both equally. When first introduced in 1971, such contracts called for an after-tax profit split of 70-30 in favor of Pertamina." Later the formula for an 85-15 percent split, again in favor of the government-owned company, was established. Recently, due to low world prices for crude petroleum, the profit share of the foreign partner has been increased to 20 percent."

Approximately 44 foreign contractors are currently operating in Indonesia in the production of crude petroleum.[89] Pertamina plans to sign about another 10 new contracts." Other foreign investors include companies located in Great Britain, Japan, Canada, France, Italy, and the Netherlands.

As part of Indonesia's efforts to broaden the nation's industrial base and shift from natural resource exports to downstream value-added exports of products derived from crude petroleum and natural gas, several petrochemical projects are being considered. Shell Oil Corp. in cooperation with certain Japanese companies and the Indonesian firms, Bimantara and Humpuss, have begun a feasibility study for an integrated olefins complex which will manufacture a wide variety of petrochemicals for the Indonesian market." The proposed $1.2 billion complex will have the annual capacity to produce 200,000 metric tons of polypropylene and 350,000 metric tons of ethylene. The first phase includes annual production capacities of 150,000 metric tons of vinyl chloride monomer, 70,000 metric tons of polyvinyl chloride, 30,000 metric tons of ethylene dichloride, and 130,000 metric tons of chloralkali.[91] The joint-venture partners for the first phase include Indonesian and certain Japanese companies.

Thyssen Rheinstahl Technik of West Germany has expressed an interest in building a joint venture aromatics complex at Cilicap on the island of Java." The West German firm agreed to invest $916 million with $716 million coming from foreign loans. The Indonesian partner, Humpuss Aromatics, will provide 30 percent of the balance, with the remainder in joint-venture equity. This joint venture is planned to be onstream by 1991 with the annual capacity to produce 217,000 metric tons of para-xylene and 405,000 metric tons per year of benzene for export.

Major Energy-Consuming Industries

Estimated crude petroleum production in 1988 was 1.1 million barrels per day from 6,065 producing wells." This production figure was 4 percent less than the crude petroleum production in 1987. Natural gas production for 1988 was 83.6 trillion cubic feet.

Indonesia is the largest exporter of natural gas in the world.[94] A 1987 report on the Indonesian petroleum industry prepared by the U.S. Embassy in Jakarta forecast as its worst-case scenario that given the present rate of the country's consumption of crude petroleum, and current resources, Indonesia would be a net importer by the year 2000." Indonesian energy officials have been actively pursuing an energy policy which is aimed at substituting natural gas for products derived from crude petroleum. A recent statement by a Government official said that crude petroleum's share of domestic energy consumption had decreased from 82 percent to 63 percent over 1978-88." The principal natural gas producing areas in Indonesia are around the regions of Arun and Bontang.[97] The first cargo of LPG to Japan under a 10-year contract between Pertamina and six Japanese companies, from the Arun LNG complex was made during October 1988.[98] Pertamina anticipates that about 1.95 million metric tons per year will be exported under this contract.[99] Other deliveries to Taiwan are expected to begin in 1990, and exports to South Korea may increase.[100]

" U.S. Department of State Telegram, "Indonesia: Investment Climate Survey," Jan. 26, 1988, pp. 7-8.
" Ibid.
" U.S. Department of State Telegram, The Petroleum Report, Indonesia, Embassy of the United States, July 1987, Jakarta, Indonesia.
"News in brief-Indonesia," *Petroleum Economist,* December 1988. p. 422.
" "International Outlook, Indonesia," *World Oil,* August 1988, pp. 104-105.
" Ibid.
" "Shell in $1.2 Billion Olefins, Polypropylene Projects in Indonesia," *European Chemical News,* Jan. 18, 1988, p. 30.
" Ibid.
" "Thyssen in Aromatics Venture in Indonesia," *European Chemical News,* Apr. 4, 1988, p. 26.
" Ibid.
" "International Outlook, Indonesia," *World Oil,* August 1988, p. 104.
" U.S. Department of State Telegram, The Petroleum Report, Indonesia, Embassy of the United States, July 1987, Jakarta, Indonesia.
" "Indonesia-Critical Choices on Energy Policy," *Petroleum Economist,* February 1988, pp. 45-47.
" Ibid.
" "News in Brief, Indonesia," *Petroleum Economist,* October 1988, p. 350.
" Ibid.
I" Ibid.

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Currently, Indonesia's domestic natural gas consumption is estimated to be about 900 million cubic feet per day which represents around 19 percent of total energy consumption.[101]

Very little is known about the size of Indonesia's coal reserves, however, some estimates place these up to 25 billion metric tons.[102] Coal is mined principally in the Ombilin and Bunkit Assam areas in Sumatra. The Bukit Assam mine represents a $1.12 billion investment with 60 percent provided by the World Bank.[103] To date, at least eight joint venture mining contracts have been undertaken, but none of these have reached commercial production, principally due to lack of an infrastructure to support commercial operations, and, in some cases, quality difficulties with the deposits.[104] Because of these difficulties, Indonesia has had to import coal to sustain the Suralaya power plant which supplies Jakarta, as well as for the cement and other industries.[105] According to a 1987 report, Pertamina employees numbered around 50,000.[106] Foreign contractors employed approximately an additional 20,000, of whom around 6 percent are expatriates.

Ammonia and urea

Industry profile.—Production facilities for ammonia and urea in Indonesia are currently Government-owned except for the ASEAN Aceh fertilizer plant located near the Arun gas field in Aceh province. Output from the ASEAN plant is shared with other members of the Association of Southeast Asian Nations. The Indonesian nitrogen fertilizer industry presently consists of 9 plants producing urea from natural-gas-based ammonia. The plant at P.T. Pipuk Kalimantan Timur is reportedly the largest of its kind in the world. Total capacity for these 9 plants is 4.47 million tons per year of urea.

Domestic market.—The following tabulation shows Indonesian nitrogen fertilizer production and domestic consumption during 1985-87:[107]

Year	Production (1,000 metric tons nitrogen)	Apparent consumption
1985	1,402	1,285
1986	1,749	1,299
1987	1,849	1,359

Indonesia consumed about 73 percent of its domestic total nitrogen fertilizers production in 1987. One industry source stated that the Indonesian industry is expected to continue growing at 7 percent annually over the foreseeable future. Indonesia's main export market for nitrogen fertilizers is China. The United States does not import significant quantities of fertilizers or fertilizer materials from Indonesia.

Effects on production costs.—Although detailed cost analyses of the Indonesian ammonia and urea industries are not available, it is known that natural gas is provided to this industry sector at $1.00 per million Btu's, a price which has been reported to be one-third the price of exported LNG.[108] This cost of feedstock material would probably enable Indonesian ammonia/urea producers to manufacture urea below the equivalent costs for other world producers. In addition, the Indonesian government offers assistance to Indonesian domestic urea purchases.[109]

Effects on .competitiveness.—Most of the nitrogen fertilizers produced in Indonesia are domestically consumed, since agricultural industries represent about 25 percent of the GDP and employ about SO percent of the workforce."[0] Indonesia is self-sufficient in fertilizer production, and exports to China and other Asian nations. Because of transportation costs, and the lower production costs of Indonesian producers, U.S. and other Western Hemisphere nitrogen fertilizer producers would probably not be as price-competitive in this Asian market.

Effects on resource allocation.—The Indonesian fertilizer industry pays the lowest price per million Btu's consumed of any other industrial sector in Indonesia; this causes a distortion in the pattern of alternative uses for this natural resource. Steel manufacturers, and other industrial users pay $2.00 to $3.00 per million Btu's for natural gas which is priced more closely to the export value for LNG. According to the 1987 *Petroleum Report,* "As more and more gas reserves at the Arun and Badak fields are tied up in low priced domestic use, Pertamina's capability to pursue long-term gas export sales agreements beyond present contractual obligations is threatened. In addition, other industrial users have complained to the Indonesian Government regarding the preferential treatment seemingly given the fertilizer industry. The

[101] Ibid.
[102] Ibid.
[103] "Indonesia-Critical Choices on Energy Policy," *Petroleum Economist,* February 1988, p. 46.
[104] Ibid.
[105] Ibid., p. 46.
[106] Ibid., p. 46.
[107] Food and Agriculture Organization of the United Nations, Rome, *Current World Fertilizer Situation and Outlook 1986/87-1922/93,* Italy, 1988.

U.S. Department of State Telegram, The Petroleum Report, Indonesia, Embassy of the United States, July 1987, Jakarta, Indonesia, p. 57.
[10o] U.S. Department of State Telegram, New Trade Act Report for Indonesia," November 1988, Jakarta, Indonesia.
[10] U.S. Department of State Telegram, "Indonesia" Investment Climate Survey," Jan. 26, 1988, Jakarta, Indonesia.
[11] U.S. Department of State Telegram, The Petroleum Report, Indonesia, Embassy of the United States, July 1987, Jakarta, Indonesia, p. 57.

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Government is concerned about this situation, but no solution has yet to be announced.

Refined petroleum products

Petroleum refining is wholly owned and operated by Pertamina, the state energy monopoly. By Indonesian law, foreign investment is not permitted in this industry sector; however, foreign loans may be negotiated for future capacity additions.[112] The United States does not import refined petroleum products from Indonesia.

Other OPEC Nations

As of January 1, 1989, the estimated proved reserves of crude petroleum in these ten nations[113] amounted to 435 billion barrels, or 48 percent of the world's total. Iran, Iraq, Kuwait, and the United Arab Emirates (UAE) accounted for the majority, with approximately 383 billion barrels in proved reserves. Many exploration programs in the 10 nations have been reduced or curtailed as a result of the decrease in the world price of crude petroleum.

The estimated proved reserves of natural gas for the 10 nations, as of January 1, 1989, amounted to 1,210 trillion cubic feet, of which Iran accounted for the majority, or 41 percent. Although these nations represented about 30 percent of the world's total proven reserves of natural gas in 1988, they accounted for less than 10 percent of world production.[114]

Beneficial Government Practices

OPEC plays a major role in determining the world price of crude petroleum. In August 1986, production restraints had been reinstated by OPEC in art effort to maintain higher crude petroleum prices. This generally resulted in stable worldwide production and strengthened prices in 1987.[115]

Overall OPEC production increased significantly in 1988, however, primarily because of temporary abandonment of these quota restraints by many of the Gulf States)"

New guidelines were agreed to at the November 1988 OPEC meeting in Vienna, Austria. These guidelines, said to be the first to specifically include Iraq, set a new target price of $18 per barrel of crude petroleum)" The production level set by OPEC to meet this target was 18.5 million barrels per day for the first six months of 1989.

Concern has arisen, however, about the ability of OPEC producers to adhere to their quotas and maintain this production level. Nations such as Kuwait and the UAE are said to have little reason to produce at their allocated levels since this would significantly reduce their productive capacity utilization."[118] It is expected that if several of the OPEC nations exceed their quotas, Saudi Arabia and Kuwait will again overproduce in an attempt to persuade them to return to their quota allocations.

Domestic prices for the crude petroleum and natural gas are generally determined by the individual governments directly or through their State-owned companies.[119] Little further information is available about domestic pricing within these nations. One example of differential pricing, however, can be found in Kuwait's pricing of its natural gas in 1984. In that year, Kuwait began to import natural gas to supplement its declining production of associated gas. Questions apparently arose concerning the pricing of the imported gas because the world price at that time was said to "substantially" exceed that of Kuwait's domestic price.[129]

Some of the nations reportedly provide their hydrocarbon industries with various assistance such as differential pricing. Qatar, for example is said to provide free utilities and land, as well as "heavily subsidized feedstock and fuel."[121] It should be noted that production costs of crude petroleum in these countries are considered to be relatively low compared with those of other producers. In 1987, the costs of producing crude petroleum in the UAE were $3.23 per barrel offshore and $1.20 per barrel onshore.[122]

As of May 1988, Nigeria was said to be considering a reduction of the subsidies on petroleum products as part of its Structural Adjustment Program (SAP). The SAP, introduced in May 1986, is intended to improve Nigeria's economic situation by addressing issues that include the country's dependence on

"a "Another Export Refinery Planned," *Petroleum Economist,* May 1988, p. 174.
[113] The nations covered under this section are Algeria, Ecuador, Gabon, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, and the United Arab Emirates.
[114] G. Vernon Hough, "Production and Reserves Increase," *Petroleum Economist,* August 1988, p. 255.
"[2] "Reserves Up Worldwide and Outside OPEC," *Oil and Gas Journal,* Dec. 26, 1988, p. 43.
"[8] *Petroleum Economist,* January 1989, p. 3.
[117] "OPEC's Upsurge Boosts World Total," *Petroleum Economist,* January 1989, p. 4; "OPEC's Patch Job Isn't Oil Tight," *Business Week,* Dec. 12, 1988, p. 34.
"[8] "Consultant Sees $12-15 Per Barrel Average OPEC Price in 1989-90," *Oil & Gas Journal,* Jan. 16, 1989, p. 15.
[119] U.S. International Trade Commission, *Potential Effects of Foreign Governments' Policies of Pricing Natural Resources,* USITC Publication 1696, May 1985, p. 71.
[120] American University, *Persian Gulf States-A Country Study,* 1985, p. 100.
[121] U. S. Department of Commerce, *Foreign Economic Trends and Their Implications for the United States-Qatar,* May 1988, p. 6.
[122] Ibid., p. 7.

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imported crude petroleum, its fiscal deficit, its balance of payments, and the potential for continued noninflationary growth. [123]

Foreign Investment Policies

Foreign investment in varying degrees and forms is allowed in many of the nations. Iraq has stated that it will not allow any foreign investment except that of other Arab countries, which will be treated in a manner similar to that of domestic investment. [124] It has been speculated that Iraq may now be interested in expanding investment opportunities to generate revenues that can be used to repay debts incurred during its war with Iran. Both Iran and Iraq will have to rebuild their petrochemical industries, although to different extents. The cost of reconstructing overall industry in the two countries is estimated at S200 billion. U.S. companies seeking contracts are expected to face competition from countries with lower labor costs, as well as potential difficulties in re-entering the Iranian market. [128]

In Libya, U.S. sanctions imposed in 1986 in reaction to that country's support of terrorism resulted in the freezing of U.S. crude petroleum assets by placing them in escrow. Under an agreement reached in 1986 between five U.S. firms and Libya, the 49 percent share in Libya's state-controlled crude petroleum company held by the U.S. firms was to be recognized by Libya for 3 years. The agreement called for Libya to work the U.S. companies' oilfields, paying the operating costs, but also retaining the revenues. The agreement will expire in June 1989. [128] According to recent reports by officials of the U.S. Government, some of the restrictions that apply to U.S. crude petroleum firms in Libya may be eliminated. These firms could then operate through subsidiaries or third party interests. The comprehensive sanctions, however, would remain in effect. [127]

The form of foreign investment usually found in these nations in the crude petroleum, refining, and natural gas industries is the joint venture. The main restriction on joint ventures is generally that the nation's government or the state-owned corporation must hold the controlling interest in the venture. In many cases, citizens of the nations involved and, in the case of the Middle East nations, citizens of the Gulf Cooperation Council, can be exempted from this restriction. Other restrictions not always enforced include employment requirements that call for a minimum number of indigenous workers and the sourcing of many materials locally.

Most of the nations under consideration are interested in expanding foreign investment in their countries. Qatar demonstrated its interest in obtaining foreign investment by signing the Overseas Private Investment Corporation Agreement with the United States in April 1987.128 The UAE is said to exhibit a high degree of cooperation between government authorities and foreign firms. Abu Dhabi, for example, maintains equity partnerships with U.S., European, and Japanese crude petroleum companies. U.S. firms currently operating in the UAE include Exxon, Mobil, Amerada Hess, Conoco, and Amoco. [128]

Nigeria also offers many opportunities to foreign firms. It is currently said to be considering lower royalty and tax rates for certain projects. [138] Foreign ownership in Nigerian firms has generally been limited to between 40 and 60 percent. Nigeria recently announced its intention to reduce its holdings in three large marketing companies to 40 percent. [131] This was in line with expectations that Nigeria would liberalize restrictions on foreign ownership in 1988. [132] The liberalization was generally attributed to Nigeria's need of foreign investment for both increased capital inflows and for increased development of its natural resources and exploration programs. [133] Subsidiaries of Texaco, Elf, Agip, Mobil, and Shell are among those foreign firms currently operating in Nigeria.

New legislation implemented by Algeria during 1987-88 allows for greater foreign participation in exploration. In 1988, Algeria reportedly signed an agreement with a Spanish firm under this law that would give the Spanish firm a 40-percent share in certain exploration acreage. This was the second such contract under the new law. [134]

In Iraq, foreign companies are involved in exploration, technical operations, and construction of new facilities under service contracts. [136] Qatar initiated production-sharing contracts in 1987 with at least two foreign firms that had, at one time or another, operated in the nation. [138] Qatar had utilized service industries

[123] Ibid., p. 5.
[124] U.S. Department of State Telegram, "Update of Investment Climate Statement and Investment Data," Apr. 18, 1989, Baghdad, Iraq.
[133] "Everyone Wants a Piece of the Peace in the Gulf," *Business Week,* Aug. 29, 1988, p. 40.
'a The New York Times, Jan. 16, 1989, p. 6.
[121] Ibid.

'" Department of Commerce, *Foreign Economic Trends and Their Implications for the United States-Qatar, May* 1988, p. 8.
[1]" U.S. Department of Commerce, *Foreign Economic Trends and Their Implications for the United States-United Arab Emirates,* November 1988, p. 7.
I" *OGJ Newsletter,* Jan. 30, 1989.
[131] *Petroleum Economist,* August 1988, p. 277.
[132] U.S. Department of Commerce, *Foreign Economic Trends and Their Implications for the United States-Nigeria, May* 1988, p. 9.
[133] U.S. Department of Commerce, *Marketing in Nigeria, Overseas Business Reports,* February 1988, p. 38; OGJ Newsletter, Jan. 30, 1989.
[134] *Oil and Gas Journal,* Feb. 22, 1988, p. 66.
[136] *Background Notes - Iraq,* op. cit., p. 5.
[138] *International Petroleum Encyclopedia,* 1988 y. 141.

in the past in producing crude petroleum in an effort to offset the lack of trained national workers.[137]

Service contracts usually allow countries to pursue development while maintaining control over the industry. Countries such as Algeria, Kuwait, and Libya, for example, although utilizing foreign process licensors and foreign contractors via service contracts, have generally retained control of the capital and ownership.[138] Ecuador, on the other hand, authorized a new type of service contract in 1982 that permitted foreign companies to both explore for crude petroleum and produce any found in significant amounts. The foreign company would receive payment on a predetermined share of the production for 20 years.[139] The Ecuadorian Government improved contract terms in 1983, at which time additional foreign companies signed contracts with the State company, Corp. Estatal de Petrolera Ecuatoriana.[140]

Major Energy-Consuming Industries

These nations produced approximately 11 million barrels of crude petroleum per day in 1988, or about 20 percent of total world production. The three leading producers within this group of nations in 1988 were Iraq an estimated 2.7 million barrels per day), Iran an estimated 2.2 million barrels per day), and Nigeria (an estimated 1.4 million barrels per day).

In 1988, Iraq increased its production and exports substantially.[141] The higher output was primarily attributed to an effort to finance the cost of its war with Iran.[142] The majority of Iraq's exports during this time were transported to the Mediterranean via an expanded pipeline facility through Turkey which was operating at or near full capacity. The remainder of its exports were exported via pipeline through Saudi Arabia and by tanker truck through Turkey and Jordan.[143] It is believed that Iraq's production will slow now that hostilities with Iran have ceased and that it will remain in line with other OPEC producers. Iraq reportedly accepted an OPEC quota allocation as of November 1988 and has ceased shipments of crude petroleum by truck via Turkey and Jordan to stay within the quota limits.[144]

Despite damages to key capital projects incurred during the war, Iran also maintained relatively high production, which was either stored in floating storage or exported. In an effort to circumvent attacks by Iraq on its shipping, Iran used shuttle tanker service to transport its exports.[145] Since hostilities with Iraq have ceased, Iran is expected to favor production restraint primarily in order to maintain higher prices.[148]

Production of natural gas is expected to increase as more countries develop programs for increased utilization of their reserves. Iran, which is second only to the Soviet Union in proved reserves, is considering various methods for developing its reserves, including one option to develop a domestic marketing program for its natural gas.[147] Iran reportedly signed an agreement recently in Moscow to resume trade of natural gas with the Soviet Union. A starting date, however, has not been announced.[145] Iraq is increasing its domestic pipeline network in anticipation of increased production from its reserves. In addition, Iraqi exports of natural gas to countries such as Kuwait have increased significantly. Qatar has begun to work its North Field, the largest offshore gas reservoir in the Middle East.[149]

Algeria, considered the most important natural gas producer on the African continent, has been signing more flexible contracts and expanding its market base. Nigeria is developing programs for the increased utilization of its natural gas, particularly in regard to its associated gas of which approximately 75 percent was flared in 1986.[150] One major project under consideration in Nigeria is the export of LNG to Europe.[151]

The installed petroleum refinery capacity for these nations as of January 1, 1988, amounted to approximately 3 million barrels per day (see Table 4-5). Projected expansions in the refining capacities of Kuwait and Nigeria are expected to amount to 156,000 and 150,000 barrels per day, respectively. The total refining capacity for the 10 nations in this section is expected to increase to 3.2 million barrels per day by 1991. Additional expansion plans are said to be underway for Iran and Iraq, but the dates of completion are not available. New capacity at Iran and Iraq is expected to be oriented primarily

[137] American University, ***Persian Gulf States: Country Studies,*** 1985, p. 205.
[138] United Nations Industrial Development Organization, ***Industry and Development,*** No. 14, 1985, p. 6.
[139] World Bank, ***Ecuador: An Agenda for Recovery and Sustained Growth,*** 1984, p. 91.
[140] Pennwell Publishing Co., ***International Petroleum Encyclopedia,*** 1987, p. 78.
[141] Roger Vielvoye, "OPEC's Newly Restored Discipline, Market Due Stiff Tests Early in 1989," ***Oil & Gas Journal,*** Jan. 16, 1989, p. 14.
[142] Pennwell Publishing Co., ***International Petroleum Encyclopedia,*** 1988, p. 17.
[143] ***Oil & Gas Journal,*** Sept. 28, 1987, p. 42.
[144] ***Oil and Gas Journal,*** Jan. 16, 1989, p. 15; ***Petroleum Economist,*** January 1989, p. 5.
[145] "Temporary Improvement in Revenues?" ***Petroleum Economist,*** August 1988, p. 259.
[146] "OPEC's Upsurge Boosts World Total," ***Petroleum Economist,*** January 1989, p. 287.
[147] "Temporary Improvement in Revenues?" ***Petroleum Economist,*** August 1988, p. 259.
[148] "Soviet Gas Trade to Resume," ***Petroleum Economist,*** January 1989, p. 35.
[149] ***International Petroleum Encyclopedia,*** 1988, p. 140.
[150] ***Petroleum Economist,*** op. cit., August 1988, p. 256.
[151] Ibid.; ***International Petroleum Encyclopedia,*** 1988, p. 68.

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towards domestic consumption, given the damage done to their petrochemical industry during the war.[152] The loss of much of the refining capacity in Iran resulted in the import of certain refined products that were, in many cases, produced from Iranian crude petroleum that was processed under an agreement with South Yemen. In 1986, Iran had agreements with refineries in Singapore and various Mediterranean countries in which relatively large volumes of Iranian crude petroleum were transported to these refineries, processed, and then the middle distillates were reimported into Iran and the remaining products were marketed overseas by the Iranian petrochemical company. Bids were being considered in 1986 for the construction of two new refineries in Iran. Given the hostilities, however, many such plans were either postponed or canceled outright.[153] The National Iranian Oil Company has recently announced plans to build a 230,000-barrels-per-day refinery that is expected to come onstream in 1992. This is said to be the first major new refining project since the start of Iran's war with Iraq. Plans are also underway to rebuild part of the 630,000-barrels-per-day refinery at Abadan.[154] Iraq reportedly expanded at least one of its refineries in 1983, after having to shut another because of damage during the war, and was, therefore, able to export large volumes of fuel oil in 1984 through Jordan and Turkey.[155]

Although the refineries operated by these nations are generally cost competitive with those in other countries, the relatively high costs associated with construction and operation were said to have offset the lower cost feedstock, decreasing the expected retum.[155] Non-OPEC producers, however, were still concerned about the possible impact that the expansion in Middle East capacity would have on their industries.

According to a study prepared in 1984, it was shown that if OPEC countries increased exports of their products by 1 million barrels per day, without decreasing exports of crude petroleum, the price of the products would decrease to a point at which they would cause a decline of $4.80 per barrel in the price of crude petroleum.[157]

At least four of the countries covered in this section have refining capacity in excess of their domestic needs. Algeria, for example, has about 300,000 barrels per day capacity in excess of that needed for domestic consumption. The main export markets for refined products from Algeria during 1984-87 were the United States and the EC. Total exports of these products from Algeria in 1987 amounted to 400,000 barrels per day, compared with 350,000 barrels per day in 1984.

Kuwait has been in the process of upgrading its capacity and replacing older capacity. In 1987, it was reported that Kuwait had begun to participate in the European petrochemical industry to complement its sizable investment in domestic refineries geared towards export.[155] Investing overseas -is also considered to be a hedge against both lower crude petroleum prices, decreasing the percentage of Kuwait's revenue tied directly to sales of crude petroleum, and restrictions imposed by OPEC on Kuwait's production of crude petroleum. The main export markets for Kuwait during 1984-87 were Japan and Italy. In 1987, Japan and Italy accounted for 14 percent and 19 percent, respectively, of Kuwait's total exports of these products which amounted to 400,000 barrels per day. Exports to the United States amounted to 12,500 barrels per day in 1987, or 3 percent. As of 1986, Kuwait was said to be refining about 60 percent of its crude petroleum production.[159]

[152] *World Oil Trends,* p. 92.
[153] *OPEC, Its Member States, and the World Energy Market,* p. 226.
[154] *Oil and Gas Journal,* Jan. 2, 1989, pp. 22-23.
[155] Ibid., p. 242.
[155] Ibid.
[157] *International Petroleum Encyclopedia,* 1984, p. 347.
[159] *International Petroleum Encyclopedia,* 1987, p. 129.
[159] *Petroleum,* November 1986, pp. 404-405.

Table 4-5
Refined products: Production capacity in certain OPEC countries, 1985-88
(1,000 barrels per day)

Country	1985	1986[1]	1987	1988
Abu Dhabi	185	1	185	180
Algeria	465	465	465	465
Ecuador	82	1	88	123
Gabon	20	16	23	20
Iran	530	530	530	530
Iraq	319	319	319	319
Kuwait	669	634	618	628
Libya	330	330	329	329
Nigeria	250	1	250	270
Qatar	56	1	62	62
Total	2,906	2,294	2,869	2,926

[1] Energy information Administration, *International Energy Annual 1985,* p. 38.
Source: *international Petroleum Encyclopedia,* 1985, 1987, and 1988, except as noted.

In 1984, Libya's capacity for producing refined products was increased by 220,000 barrels per day with the start-up of the Ras Lanuf refinery. Although export-oriented, the refinery operated at a low rate of utilization during 1985-86, primarily because of a decrease in demand. In 1986, it was estimated that the utilization rate of the facility was about 40 percent. A portion of the refinery's output is used as feedstock for the ethylene unit of the petrochemical facility that is currently being developed at Ras Lanuf.[160] Western Europe is said to be the main market for Libyan exports of these products.[161]

Nigeria currently has sufficient refinery capacity to satisfy its domestic needs and, until recently, has had no export-oriented refineries.[162] A large petrochemical facility is under development in Port Harcourt, however, that includes, among other units, an $800 million refinery. According to an industry source, the refinery unit was said to have been commissioned in early 1989. A portion of the output from the refinery will probably be slated for export. In addition, a project is being considered in which natural gas would be used to supply a Nigerian power plant. Once this is underway, refined products that are currently used as fuel could be exported. The refinery is said to represent Nigeria's efforts to diversify away from dependence on revenues from crude petroleum.[163]

The crude petroleum, refining, and natural gas industries in most of the nations under consideration are nationally controlled. The Kuwaiti Government, for example, established the Kuwait Petroleum Corporation (KPC) in 1980 as an umbrella organization directly responsible to the Kuwait Ministry of Oil for all operations involving hydrocarbons.' In Iraq, as of October 1987, the Ba'ath Party controlled petroleum policy, while the Ministry of Oil managed operations and marketing and headed up the Iraq National Oil Company.[188] Nigeria, the largest crude petroleum producer in Africa, oversees its national crude petroleum industry via the state-owned Nigerian National Petroleum Corporation (NNCP). The Nigerian government recently announced that NNCP would be "commercialized," but would remain state-owned .[166]

[1,2] *OPEC, Its Member States, and the World Energy Market,* p. 253.
[1911] Petroguide Limited, "Libya," Petroguide 1988/89.
[122] Petroguide Limited, "Nigeria," Petroguide 1988/89.
[183] New York Times, August 29, 1988, p. 28.
[1"] U.S. International Trade Commission, Potential Effects of Foreign Governments' Policies of Pricing Natural Resources, USITC Publication 1696, May 1985, p. 65.
[1"] U.S. Department of State Telegram, Background Notes - Iraq, October 1987, p. 4.
[1"] Petroleum Economist, February 1988, p. 63.

Ammonia

Industry profile.—The installed production capacity for ammonia as of 1986 for at least eight of these nations amounted to an estimated 6 million metric tons per year."'" Kuwait, Libya, and Iraq accounted for the majority, or 61 percent. Kuwait, although having a limited consuming population, reportedly has one of the larger nitrogen fertilizer industries in OPEC. Production in Kuwait apparently declined during the war between Iran and Iraq primarily because of the country's geographical proximity to the fighting.[168]

Plans for adding production capacity for ammonia in these nations have included those of Algeria to build a 272,000-metric-ton-per year plant that was expected to start up in 1987.[160] Although Algeria is said to have the potential to become a major producer in the future, its nitrogen fertilizer industry to date has reportedly been characterized by production delays.[170]

Qatar is also planning to add capacity by building a 547,500 metric ton-per-year plant, expected to be completed in 1990. The facility, located at Qatar's fertilizer complex in Umm Said, will increase Qatar's total production capacity for ammonia to 1.2 million metric tons per year. The gas feedstock for the facility will be provided from the offshore North Field.[171] Qatar's nitrogen industry was established in 1973, primarily to effectively utilize the large amounts of associated natural gas available in the area. The Norwegian firm Norsk Hydro is said to have a 25 percent stake in Qatar's nitrogen fertilizer company, as well as running the plant and marketing production.[172]

In 1987, Iran announced tentative plans to build an ammonia/urea complex.[173] Acording to a recent report, however, an unidentified agrochemicals plant that was planned in Iran has been canceled.[174] One of the largest markets for nitrogen fertilizers in the Middle East, Iran imported most of the ammonia it consumed during 1983-85. Given the size of Iranian reserves of natural gas and the availability of other fertilizer raw materials, the nation is said to have the potential to become a major producer of fertilizers.[178] Currently, however, the petrochemical industry in Iran has been significantly affected by the war with Iraq.

Marwan Fayad and Homa Motamen, The Economics of the Petrochemical Industry, New York, 1986, pp. 209-215.
[1"] William F. Sheldrick, ***World Nitrogen Survey,*** World Bank Technical Paper No. 59, 1987, p. 196.
[1"] British Sulfur Corp., Ltd., ***Nitrogen,*** June 1987, p. 22.
[1"] ***World Nitrogen Survey,*** pp. 176-77.
[171] British Sulfur Corp., ***Nitrogen,*** June 1988, I. 10.
[172] ***World Nitrogen Survey,*** p. 200.
[173] ***Hydrocarbon,*** October 1987, p. 23.
[174] ***European Chemical News,*** Feb. 27, 1989, p. 32.
[1"] ***World Nitrogen Survey,*** p. 197.

A fertilizer facility in Nigeria at Onne, near Port Harcourt, started up during 1987-88. The facility has production capacity for ammonia of approximately 350,000 to 365,000 tons per year.[178]

Start-up of an ammonia plant and a urea plant in Iraq, with respective capacities of 330,000 and 580,000 metric tons per year, was expected in 1988.[177] As with Iran, production capacity in Iraq has been affected by the war. Approximately 500,000 metric tons per year of nitrogen fertilizer capacity was damaged and/or closed down during the war.[178]

It was announced in February 1988 that negotiations were underway to plan an ammonia facility in Abu Dhabi that would be operated as a joint venture.[178] An ammonia plant is currently operating in Abu Dhabi as a joint venture between the Abu Dhabi National Oil Company and Compagnie Francais des Petroles.[188]

Domestic market.-Countries such as Kuwait, Qatar, and Libya are expected to export much of their production of petrochemicals because of the relatively small size of their consuming populations. Larger countries, however, such as Iran, Algeria, and Iraq, are expected to first satisfy domestic demand and then export the surplus.[181] Trade in ammonia internationally is said to be relatively small compared with production, because the majority of the ammonia produced is used locally to produce nitrogen fertilizers. Approximately 10 percent of the ammonia produced worldwide is traded.[182] The following tabulation indicates the level of exports of ammonia by Qatar and Libya during 1983-87:[183]

Country	*1983*	*1984*	*1985*	*1986*	*1987*
	1,000 metric tons				
Qatar	140	165	165	185	235
Ubya	280	135	115	90	35

[178] *International Petroleum Encyclopedia,* 1987, *p.* 96.; *International Petroleum Encyclopedia,* 1988, *p.* 72.
[179] *European Chemical News,* Feb. 27, 1989, p. 32.
[180] *World Nitrogen Survey, p.* 199.
[181] British Sulfur Corp., *Nitrogen,* February 1988, p. 12.
[182] *World Nitrogen Survey, p.* 199.
[183] Ibid.
[184] "Tight Ammonia Supply Augurs Well for European Producers," *European Chemical News,* Feb. 27, 1989, p. 48.
[185] Ibid.

According to a recent report, the Nigerian facility is expected to export ammonia until the urea plant at the same complex is in commercial operation, at which time the ammonia will be used domestically to produce urea. The initial exports of ammonia from the Nigerian facility were delivered to Spain.[184] The Algerian facility is also expected to export since Algeria is currently said to be an ammonia exporter.[185] Algeria is, however, a net importer of nitrogen fertilizers.[186] The United States does not import these products in significant quantities from these other OPEC nations.

Table 4-6 shows the available data for production and consumption of nitrogen fertilizer by the nations covered in this section.[187] In 1987, the EC imposed antidumping duties on urea imports from Libya and Saudi Arabia. A number of other countries found to be dumping urea on the EC market, including Kuwait, agreed to limit their exports to the EC.[188]

Effects on competitiveness.-The natural resource used to produce ammonia is the associated natural gas produced along with crude petroleum recovery operations. New investment in ammonia and/or urea producing facilities is said to be justified when natural gas is available at prices lower than $1.00 per million Btu.[188] It was estimated that the value of the natural gas utilized in Libya, Algeria, Nigeria, and the Gulf Emirates in producing ammonia in 1986 was $0.80 per million Btu, whereas the value of that utilized in the United States in 1986 was $2.50 per million BTUs. In the Middle East, feedstock and fuel were reported to account for 27 percent of the total cost of producing ammonia in the third quarter of 1988, compared with 68 percent in Northern Europe.[188] The total cash cost

[186] *International Petroleum Encyclopedia,* 1988, op. cit., p. 72.
[187] *Nitrogen,* June 1987, p. 87.
[188] *World Nitrogen Survey, p.* 176.
[189] Nitrogen fertilizers include urea, ammonium nitrate, ammonium sulfate, and nitric acid.
[190] *Nitrogen,* June 1987, p. *7; Nitrogen,* December 1987, p. 8.
[191] *World Nitrogen Survey, p.* 49.
[192] **Ibid.,** *p. 154.*

Table 4-6
Nitrogen fertilizers: Other OPEC nations' production, imports, exports, and consumption, 1987

Country	*Production*	*Imports*	*Exports*	*Consumption*
	1,000 metric tons nitrogen			
Algeria	113.8			114.4
Ubya	239.9	26.	242.	22.5
Iran	72.5	556.9	0.0	526.1
Iraq	64.0	48.3	23.0	131.0
Kuwait	316.0	.2	377.2	.2
Qatar	343.6	.1	367.6	.7
UAE	211.6	1.5	224.6	.7

' Not available.

Source: *Nitrogen,* June 1988.

of producing ammonia in the Middle East was $73 per metric ton, compared with $105 per metric ton in Northern Europe.[191] The landed cost for exports of ammonia from these countries ranged from $175 to $255 per ton, depending on the market.[192]

The major costs not included in the previous discussion were capital investment costs and transportation costs. The fixed cost factor in the Middle East accounted for 56 percent of the total vis-a-vis 22 percent in Northern Europe. Capital investment costs for facilities in the Middle East were said to be higher than those in developed countries because of factors such as higher installation costs, the relative lack of skilled labor, and the necessity of importing many of the materials used.[198] Transportation costs for ammonia and urea in these countries in 1982 were estimated to account for 20 to 40 percent of their production cost.[194] In 1980, the freight costs for shipping bulk urea from Qatar to developed countries ranged from $33 per metric ton to $54 per metric ton. The rates for shipping bagged urea from Qatar ranged from $58 per metric ton to $85 per metric ton.[195]

Ethylene

Industry profile.—Energy-rich countries are said to be slowly increasing their share of world production of basic olefins.[199] The installed production capacity for ethylene in the Middle East in 1985 amounted to 1.8 million metric tons per year, of which Saudi Arabia accounted for 1.6 million, or 89 percent.'" Qatar was said to have produced 204,000 metric tons of ethylene in 1984.[1]" As of 1987, installed ethylene production capacity in the Middle East and the Persian Gulf had increased to 2.02 million metric tons per year, of which Saudi Arabia accounted for 79 percent and Qatar, with 280,000-metric-tons-per-year

capacity, accounted for 14 percent.[199] In 1986, Qatar reportedly commissioned a 150 million cubic feet per day ethane recovery unit at its Umm Said facility that would provide feedstock for both ethylene and fertilizer production.[299] Iran had at least one petrochemicals facility that was complete as of the start of its war with Iraq but which was destroyed during the war. Iraq was said to be planning an ethylene cracker, with a capacity of 450,000 tons per year, that would come onstream polypropylene, and other products. The ethylene unit, which reportedly came onstream in 1987, is apparently using naphtha obtained from the Ras Lanuf refinery. Table 4-7 lists total production capacity in these nations for olefins.

Domestic market.—A report by Sabic in 1987 stated that the export of petrochemicals from the Middle East to other countries could decrease in the future as more of the petrochemicals are consumed by domestic industries.= The Middle East is said to currently consume 54 percent of the petrochemicals it produces[292] and SABIC currently accounts for approximately 87 percent of the consumption of ethylene in the Middle East 2[03] Investment in the petrochemical industries in many of the OPEC nations is expected to maintain its present growth rate into the early 1990 ' .[294]

'[0]' *European Chemical News,* February 27, 1989, p. 48.
"[2] *World Nitrogen Survey, p. 155.*
[1612] *The Economics of the Petrochemical Industry,* p. 119.
'[64] Ibid., p. 123.
le° Ibid., p. 221.
'" Walter Vergara and Donald Brown, *The New Face of the World Petrochemical Sector: Implications for Developing Countries,* World Bank Technical Paper No. 84, 1988, p. xviii.
'[27] *Chimie Actualites,* Dec. 1, 1986, p. 5.
'[92] John Evans, *OPEC, Its Member States, and the World Energy Market,* 1986, p. 281.
1" Information Chimie Mensuel, November 1987, pp. 170-71.
International Petroleum Encyclopedia 1987, p. 131.
[001] *Hydrocarbon,* February 1987, p. 11.
••[2] *Chemical Engineering Mar.* 16, 1987, p. 28.
2" Plastics Materials, February 1987, p. 15.
[2o4] *The New Face of the World Petrochemical Sector: Implications for Developing Countries,* p. 65.

Table 4-7
Olefins: Production capacity In certain OPEC nations, 1984 and 1987'

(1,000 metric tons)

Country	*1984*	*1987*
Algeria	120	120
Ecuador	–	100
Gabon	(2)	(21
Iran	45	325
Iraq	160	160
Kuwait	(2)	300
Libya	440	440
Nigeria	35	315
Qatar	280	280
UAE	(2)	(2)

' Ethylene, propylene, and butadiene.
[2] Not available.

Source: Marwan Fayad and Noma Motamen, *The Economics of the Petrochemical industry,* 1986, p. 223.

The Libyan ethylene facility that reportedly started up in 1987 was expected to export much of its product until additional units in the Ras Lanuf petrochemical complex were completed, at which time the ethylene would be consumed domestically. The production capacity for ethylene at this facility is approximately 330,000 metric tons per year.[205]

A 250,000 metric ton per year facility that was planned for Iran in 1986 was expected to export its production. It is not clear, however, whether this facility has progressed beyond the planning stage.[206] The United States does not import significant quantities of ethylene products from these other OPEC nations.

[206] *Petroleum,* July 1987, p. 277.
[206] *Chemical & Engineering News,* December 22, 1986, p. 8.

Effects on competitiveness.—Many of the OPEC nations are expected to be able to maintain a significant cost advantage in the future in producing ethylene and other basic olefins, compared with producers in Western Europe and in countries which must import the feedstock. In 1990, for example, it is estimated that countries with access to naphtha or natural gas feedstock priced at $0.60 per million Btu will be able to produce ethylene for about 30 percent less than producers in Western Europe and countries such as Japan and South Korea.

Chapter 5

China[1]

The natural resources covered here are coal, crude petroleum, and natural gas. Coal now supplies about 75 percent of China's total domestic energy needs, crude petroleum about 21 percent, and natural gas about 2 percent of the total. In 1988, China's recoverable coal reserves were reported to be 98.9 billion metric tons.[2] As of January 1, 1988, China's estimated proved reserve of crude petroleum was 18.4 billion barrels, while China's natural gas reserves were reported at 30.7 trillion cubic feet.

In the People's Republic of China, the State owns these natural resources. The most powerful economic agency in China is the State Planning Commission (SPC). The SPC, among other things, sets production targets for state industries, sets prices on products, and approves most major investments.[3] Production of crude petroleum and natural gas comes under the jurisdiction of the Ministry of Petroleum Industry (MOPI). Usually the production goals for crude petroleum and natural gas for the coming year are negotiated between SPC and the MOPI.

Beneficial Government Practices

The authority for pricing goods of national importance, such as coal, crude petroleum, and natural gas, resides with the Central Government in China. The setting of prices appears to be separated from annual economic plan management or investment planning. For the most part, energy prices have remained fixed since the late 1950's. Although fundamental energy price reform has been repeatedly discussed, little action has yet been taken. The Chinese Government fears that raising energy prices will lead to price rises throughout the economy.[4] To encourage industrial development, industrial fuel prices were set artificially low while households and other users paid two to three times the industrial price.[5]

The Chinese Government reportedly does not enumerate its price-setting principles; however, the history and structure of prices indicate that price stability is given a high priority. The accounting cost of domestic production is given greater weight in price setting than the opportunity cost in overseas markets.

In China, energy prices are established in order to generate revenue. Some of the revenue is then reinvested in capital construction, and some is used to purchase raw materials. However, the bulk of the revenue presumably is sent to the provincial and national governments.

China's policy on pricing coal, crude petroleum, and natural gas has at times created problems, such as inefficient utilization of available energy resources, since the pricing policy tends to understate the relative worth of raw material inputs. As a result, energy prices in China are on the whole lower than international prices. In addition, internal transactions and the internal prices for crude petroleum and natural gas are largely insulated from external transactions and international prices.

The State Council instituted price reforms in March 1984 on energy commodities in the form of a two-tier price structure.[6] However, China's pricing policy on coal and crude petroleum through 1988 still involved state-imposed prices up to predetermined levels of production. Industry sources report that there is no single price for natural gas in China; rather, there are regional prices and the regional government determines the price. However, low prices for natural gas have resulted in the flaring of nearly one-third of the gas produced in some crude petroleum fields.[7] The price for natural gas is

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The possible repercussions on the investment climate in China resulting from the current unrest in the nation are as yet unknown and not herein addressed.

[2] U.S. Department of Energy, *International Energy Annual 1987,* Oct. 6, 1988, pp. 75, 76, and 78; and *International Petroleum Encyclopedia 1988,* p. 245.

World Bank, *China: The Energy Sector, Annex 3 to China: Long-Term Development Issues and Options,* September 1985, pp. 121-124; Westview Special Studies in International Economics and Business, *China's Petroleum Industry in the International Context,* ed. Fereidum Fesharaki and David Fridley, the East West Center, Resources Systems Institute, Honolulu, Hawaii, published in Boulder, Colorado, 1987, pp. 6-8; and *China's Petroleum Industry: International and Domestic Policy Imperatives,* David Fridley and Feredidum Fesharaki, East West Center, Resources Systems Institute, Honolulu, Hawaii, March 1987, pp. 1-4, 8, and 10.

[4] Allan L. Clark, James P. Dorian, and David Fridley, "Problems and Prospects of China's Mineral and Energy Industries," Ch. *7, Asia Pacific Report 1988-1989,* 1989, ed. by Charles E. Morrison, East West Center, Honolulu.

Ibid.

* Much of this pricing information reported in this section for the period subsequent to the USITC Publication 1696 (May 1985) is based on telephone conversations between a staff member of the USITC and Mr. James P. Dorian, Project Fellow, East West Center, Resource Systems Institute, Honolulu (Mar. 8, 1989) and Dr. Tim Woodward, President, Chinese Energy Ventures, Inc. (CEVCO), Washington, DC (Mar. 3, 1989). As a result of these discussions the Commission received many published reports, papers, and yet-to-be published reports, as well as Dr. Dorian's Doctor of Philosophy dissertation on the role of minerals in China (University of Hawaii, December 1987). The regional coordinator of China, Caltex Petroleum Corp., Dallas also furnished information on crude petroleum pricing in China during a Mar. 3, 1989, telephone conversation with a staff member of the United States International Trade Commission. The Chairman of Island Creek Corporation, Lexington, KY, which operates a joint venture With the Ministry of Coal Industry known as the Antaibao coal mine project, furnished first hand information on China's coal industry during a telephone conversation on Mar. 15, 1988, with a staff member.

[7] Allan L. Clark, James P. Dorian, and David Fridley, "Problems and Prospects of China's Mineral and Energy Industries," Ch. *7, Asia-Pacific Report 1988-89,* 1989, edited by Charles E. Morrison, East West Center, Honolulu.

higher in those regions where supply is short and/or demand is high. An industry source stated that LPG has an ex-refinery price which ranges from $14.45 per metric ton to 443.35 per metric ton (which is in the range of world prices) depending on the region. LPG reportedly commands a markup at retail of 33 percent above the refinery price range. This industry source reported that in some regions or markets that are really energy deficient, LPG can retail in excess of $200 per metric ton.

Another industry source stated that the average wellhead price of natural gas in China was still about $1.30 per thousand cubic feet. [8]

This source reported that under normal conditions, sales of natural gas to industrial users (such as boilers or for fuel petrochemical plants) for feedstock would sell at $1.75 to $2.00 per thousand cubic feet. Natural gas reportedly would command a price of about $2.60 per thousand cubic feet in sales to residential users (where the infrastructure is in place), under normal conditions.

The price of coal up to the quota level is fixed by the State Planning Commission for the approximately 2,100 mines under the Ministry of Coal Industry's jurisdiction at $11-$12 per metric ton at the mine mouth. This is also the internal delivered price as transportation costs are paid for by the State. Above the State-imposed production quota, coal sells at $35 to $40 per metric ton depending on the type of coal (e.g., steam, metallurgical). This is the free market negotiated price. The free market negotiated price range may exceed the above price per metric ton range where energy is in short supply and may be lower than the above range when energy supply is adequate. In addition, this higher price is charged to a utility, industry, and so forth when its coal needs for the next year exceed the amount allotted to it under the state plan for the upcoming year. One source reports that the price of coal in China is even more complex than stated above, and more complex even than that of crude petroleum. This source reports that there are four different coal prices in China: the state-set price, the negotiated price of coal produced by the state-owned mines in excess of the state quota, the negotiated price between coal producer and customer, and the producer-set price of coal from collectively and individually owned coal mines. Recently, local authorities and the owners of collectively or privately owned coal mines have ignored state-set prices, and have set their own coal prices. [9]

A recent article in an official Chinese publication states that price is the most sensitive question that has a direct bearing on the development of China's coal production. [10] Because coal prices have remained at such a low level for so long, China's coal mines have been unable to cover their production costs through the sale of coal. In recent years, as a result of these low coal prices, the State annually has had to subsidize the coal industry as compensation for losses. The State actually provides subsidies to all the coal-consuming units and localities by ordering the coal mines to sell them coal at low prices. Under such circumstances, the coal-consuming industry and localities have been unwilling to make investments in the development of local mines.

The internal price of crude petroleum has been fixed since 1950 at about $3.50 to $4.00 per barrel at 1987-88 exchange rates. (This is known as the official price.) [11] MOPI reported in 1988 that the China Chemical Import and Export Corporation (Sinochem) pays it the official price for the first 2 million barrels of crude petroleum per day, which represents about 70 percent of China's annual production of crude petroleum. [12] These low official prices account for the profitability of the China Petrochemical Corporation (Sinopec), which reported a net income of $1.3 billion in 1985 on sales of $12 billion (about 5 percent of China GNP). At official prices, the consolidated barrel of refined products is worth about $15 or more versus about $5 or less per barrel for the crude, leaving a $10 or more per barrel (or, 200 percent or better) gross refining margin. Therefore, the downstream refining industry (petroleum products) is the major profit center in China's petroleum sector because of the relative price structure of crude petroleum and petroleum products. [13] This price causes a severe distortion in favor of downstream petroleum products. Low crude petroleum prices encourage the overbuilding of small refineries, many in provinces or areas far removed from the crude petroleum source. Another negative impact of the official price is that, instead of saving the crude petroleum to produce value-added

• Based on information developed during a telephone conversation on Mar. 17, 1989, between a member of the U.S. International Trade Commission staff and the Chief Economist, Atlantic Richfield Co., Los Angeles, CA.

• James P. Dorian and David G. Fridley, "Problems and Prospects for China's Mineral and Energy Industries," Ch. 7, *Asia-Pacific Report 1988-89,* edited by Charles E. Morrision, East West Center, Honolulu, pp. 59-60.

"Where is the Reserve Strength of the Coal Industry," *Renmin Ribao.* Reprinted in *Foreign Broadcast Information System, Mar.* 7, 1989, pp. 27-29; and, based on information obtained during a telephone conversation between a member of the U.S. International Trade Commission staff and the Chairman of Island Creek Corp., Lexington, KY, on Mar. 15, 1989.

" This compares with average domestic first purchase price in the United States of $15.40 per barrel in 1987.

[12] "China's Oil Supply/Demand Outlook' Examined," *Hydrocarbon Processing,* October 1988, p. 19; A World Bank Country Economic Report, *China: Long-Term Development Issues and Opinions,* October 1985, pp. 71 and 72; James P. Dorian and David G. Fridley, op. cit., pp. 55-62; Nicholas R. Lardy, *China's Entry into the World Economy: Implications for Northeast Asia and the United States,* University Press of America, Lanham, Maryland, 1987, pp. 30-34; and, Karsten Grummitt, *China Economic Handbook,* London, 1986, 1st ed., pp. 24 and 27.

[13] Ibid.

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petroleum products and petrochemicals, this artificial price subsidizes burning fuel oil and crude petroleum in industrial and power boilers instead of coal.

The market prices for crude petroleum under this two-tier system were pegged to world prices at the time of price reform in March 1984; and therefore, these prices do not relate to current supply and demand as they remain fixed regardless of world or national conditions over time.[14] However, there has been some decline in the dollar-equivalent value of crude petroleum and petroleum products since 1984. The market price for crude petroleum and residual fuel oil is so high it is rarely paid; therefore, the two-tier price system reportedly is only a new form of rationed allocation. Industry sources state that only if China permits the RMB to be traded on the international currency markets could domestic prices for energy natural resources be brought in line with world levels. Industry sources do not believe the Chinese government will allow this fundamental change to occur.[15]

Foreign Investment Policies

Although the Chinese Government policy since 1979 has been to actively encourage foreign investment, China remains committed to the basic principles of a planned socialist economy. As a result, the approval of foreign investment projects is closely linked to China's state planning mechanism.[16] Since 1979, China has found it necessary to expand on the original 1979 Joint Ventures Foreign Investment Law. There are two very important laws dealing with foreign investment which have been issued since 1979. The first of which is the Implementing Act. In 1983, China issued the long-awaited detailed rules under the Joint Venture Law in the form of an Implementing Act. This law contains 118 articles that detail the main features of equity joint ventures. The second of these two laws became effective in October 1986 when China enacted "Provisions of the State Council Encouraging Foreign Investment" (commonly known as "The 22 Articles"). The articles address several of the concerns of investors. The articles contain, among other things, provisions that give special tax treatment to technologically advanced enterprises and those that are export oriented. The articles also guarantee that investment proposals will be decided by the Government within 3 months of receipt. China now has more than 150 laws and regulations applying to foreign investment, covering everything from arbitration to wholly-foreign-owned enterprises."

Potential investment projects go through a multilayer screening process. The approval can come from any one of a number of government agencies (i.e., from the local planning commission up to the State Council) depending upon the value of proposed project. In addition, the Ministry of Foreign Economic Relations and Trade (MOFERT) is authorized to evaluate proposals to ensure that there is no conflict with pertinent regulations; MOFERT can also reject a proposed investment project for a number of reasons, such as the project does not provide advanced technology or renovate technology, the contract is determined to be unfair, or China already has adequate capacity for the product in question.

After initial approval has been granted, the foreign investor and the local partner (if there is one) undertake a feasibility study on the project. The detailed feasibility study becomes the basis for drawing up a legally binding contract that sets out rights and obligations of both parties. All paperwork, including the feasibility study, are forwarded to the appropriate authority (e.g., MOFERT) for final review and final approval.

By China's definition, foreign investment includes foreign funds committed in equity joint ventures, contractual joint ventures, cooperative resource exploration, wholly owned foreign firms, and compensation trade.[18] Beginning in 1980,

[14] Dr. Kim Woodward, China Energy Ventures, Inc., *Trade and Investment in China's Petroleum Industry: Trends and Projections 1981-1990,* January 1987, pp. 13-17.

[15] Ibid., and, Allan L. Clark, James P. Dorian, and David Fridley, "Problems and Prospects of China's Mineral and Energy Industries," Ch. 7, *Asia Pacific Report 1988-89,* 1989, edited by Charles E. Morrison, East-West Center, Honolulu.

[16] *Foreign Trade Investment, and the Law in the People's Republic of China,* ed. by Michael J. Moser, Hong Kong,. 2nd ed., 1987, pp. 90-94; and, National Council for U.S. China Trade, *U.S. Joint Ventures in China: A Progress Report,* Washington, March 1987, pp. 7-13 and 177-180.

[17] Far Eastern Economic Review, *Asia 1987 Yearbook,* Hong Kong, November 1986, pp. 130 and 131; "China Throws Open Its Seaboard," *The Economist,* Mar. 12, 1988, pp. 61-62; U.S. Department of Commerce, "The China Market: New Opportunities and Challenges," *Business America,* June 6, 1988, pp. 2-4; U.S. Department of Commerce, *Doing Business With China,* Overseas, Business Reports, International Marketing Information Series, OBR 88 13, December 1988, pp. 5 and 32-33. Michael J. Moser, pp. 199-201, 233-234, and 247-248; and, U.S. Department of Commerce, *Foreign Economic Trends and Their Implication for the United States: People's Republic of China,* International Marketing Information Series, FET 88 84, August 1988, pp. 6, 7, 9-11, and 13-14.

[18] Far Eastern. Economic Review, *Asia 1987 Yearbook,* Hong Kong, November 1986, pp. 130 and 131; "China Throws Open Its Seaboard," *The Economist,* Mar. 12, 1988, pp. 61-62; U.S. Department of Commerce, "The China Market: New Opportunities and Challenges," *Business America,* June 6, 1988, pp. 2-4; U.S. Department of Commerce, *Doing Business With China,* Overseas, Business Reports, International Marketing Information Series, OBR 88 13, December 1988, pp. 5 and 32-33. Michael J. Moser, op. *cit., Investment*, pp. 199-201, 233-234, and 247-248; and, U.S. Department of Commerce, *Foreign Economic Trends and Their Implication for the United States: People's Republic of China,* International Marketing Information Series, FET 88-84, August 1988, pp. 6, 7, 9-11, and 13-14.

China instituted coastal areas known as Special Economic Zones (i.e., SEZ) in an attempt to concentrate initial investment development on the eastern seaboard. The SEZs, which can offer special incentives to foreign investors, originally consisted of four municipalities in southeastern China. In 1984, 14 coastal cities and Hainan Island were also opened to foreign investment with certain policies designed for the SEZs to be applied to the 14 cities and Hainan Island. These SEZ policies include preferential tax treatment and greater decision-making authority by local governments. Now China reportedly is planning to turn its entire 3,000-mile coastline into China's front to the outside world. Hainan Island, which became a province in April 1988, is China's largest defined area offering special incentives to foreign investors.[19]

China has several objectives in setting up the SEZs, the 14 coastal cities, and Hainan Island.[20] These areas are to serve as experimental areas where capitalistic methods can be observed and new policies can be tested before nationwide application. They are also intended as areas in which China can obtain modern technology and the concurrent managerial skills necessary to effectively operate technically advanced industries.

In addition, China hopes to develop export-oriented industries in order to generate the hard foreign currency needed to pay for essential imports.[21]

Cooperative business arrangements are generally divided into two types: joint development arrangements and cooperative joint ventures (the latter are also known as cooperative business enterprises and contractual joint ventures). The U.S. Department of Commerce reports that a foreign investor must hold a minimum of 25 percent of the capital of an equity joint venture and may own up to 100 percent of a venture. Maximum duration of a joint-venture agreement is 50 years. For shorter term projects, investment may take the form of a nonequity contractual joint venture in which all assets revert to the Chinese partner at the conclusion of the venture. The foreign investor generally contributes equity in the form of technology, management techniques, and capital. The Chinese side contributes land-use rights (land is not privately held, but the right to use land is transferable and is assigned value), buildings, labor, and raw materials. Contractual joint ventures differ from equity ventures in that the contributions of the partners need not be assigned a monetary value, and the profits or production of the venture are distributed according to the provisions of the contract, rather than any partnership share.[22]

Joint development arrangements to date have been limited to Chinese foreign activities with respect to the exploration and development of crude petroleum and natural gas reserves. Under this arrangement, foreign investors agree to conduct exploration at their own risk. Once petroleum or natural gas is discovered, both parties make financial contribution to jointly develop the discovery. Income from crude petroleum sales is distributed in accordance with a fixed formula that takes into account exploration costs, development expenses, and assignable profits. China had approved 35 joint development contracts in offshore crude petroleum involving investments in excess of $1.6 billion by the end of 1985.

Under China's Joint Venture Law promulgated in 1979, MOFERT normally is responsible for approving direct foreign investment when the total investment exceeds $5 million.[23] Foreign investments of less than $5 million usually need approval only by the appropriate ministry or the government where the project is located. For projects over $100 million, approval by the State Council is required.

MOFERT reported a 30-percent increase in pledged foreign investment during 1987 and a 1.3 percent rise in actual investment.[24] By the end of 1987, total pledged investment reached over 10,000 agreements with pledges of $22.96 billion, and realized foreign investment reached $8.47 billion. The United States is the largest investor in China at $3.04 billion (13.8 percent of the total) after Hong Kong and Macao ($14.26 billion, or, in the aggregate, 65 percent of the total).

Although the official policy is to encourage foreign investment, actual conditions are still difficult as reportedly serious obstacles remain to investment.[25] The U.S. Government states that these obstacles include a complex system of

[19] Ibid.
[20] In 1985, the State Council designated three coastal areas open to investment and development. These areas contain a number of cities and are to concentrate on trade, industry, processing agricultural products, and export industries.
[21] The National Council for U.S.-China Trade, *U.S. Joint Ventures in China: A Progress Report,* Washington, March 1987, pp. 18, 139-141; and Euromonitor Publications *Limited, China Economic Handbook,* London, 1st ed., 1986, pp. 28-30.
[22] Ibid.
[23] *Foreign Trade, Investment, and the Law in the Peoples Republic of China,* ed. Michael J. Moser, Hong Kong, 1987, pp. 90-94.
[24] U.S. Department of Commerce, *Doing Business with China,* Overseas Business Reports International Marketing Information Series, OBR-88-13, December 1988, pp. 5 and 32-33; U.S. Department of Commerce, *Foreign Economic Trends and Their Implications for the United States: People's Republic of China,* International Marketing Information Series, FET 88-84, August 1988, pp. 6, 7, 9, 10, 13, and 14; and, U.S. Department of Commerce, "The China Market: New Opportunities and Challenges," *Business America,* June 6, 1988, pp. 2-6.
[25] Ibid.

controls that reportedly results in costly and difficult contract negotiations, and then a lengthy bureaucratic approval process. Other difficulties perceived by those contemplating direct investment in China include foreign exchange and finance availability, high costs of maintaining offices, quality control, supply problems, labor productivity and labor costs, and infrastructure problems.[29] As stated, several problem areas currently complicate foreign investment in China.[27] The most important problem for foreign investors is foreign exchange controls. Chinese regulations require that the remittance of profits, the purchase of imported components or raw materials, and the payment of compensation to foreign personnel be done in foreign currency. If a company has a shortage of foreign currency (usually because it is having difficulty exporting its product), then it may not be able to purchase required imported components of raw materials or pay its foreign personnel. While foreign-invested enterprises can now get foreign currency at local currency swap markets, it involves the payment of a premium which affects the profitability of the firm.

In addition to the all-important foreign exchange difficulties, there are four additional major problems facing foreign investors in China. These are (1) high production costs due to the inability to source materials and components in China; (2) difficulty in competing with foreign manufacturers for sales in the domestic Chinese and international markets; (3) a shortage of managers, engineers, technicians, and other skilled labor; and, (4) bureaucratic interference.

The Regulations on the Encouragement of Foreign Investment issued on October 11, 1986, reveal that China is attempting to encourage the continuation of foreign investment through preferential taxation, simplification of procedures, autonomy for foreign-funded enterprises, and negotiation of the duration of the joint-venture cooperation.

China's beneficial policies to encourage foreign investment in certain product areas, including energy, include unique packages of tax exemptions, reductions, and incentives. The incentives are not always automatically conferred upon foreign investors; they must sometimes negotiate for these benefits with the relevant governmental authorities. The types of incentives available to a foreign investor depend on the type of investment (equity, contractual, or wholly owned), its location, whether or not it is service- or manufacturing-oriented, and whether or not it involves advanced technology or is export-oriented. The incentives available include significant reductions in national and local income taxes, land fees, import and export duties, and priority treatment in obtaining basic infrastructural services.

China gives energy development its highest priority in encouraging the establishment of joint ventures with foreign capital. Most foreign capital in the energy sector is used either in developing its coal resources or in offshore exploration for crude petroleum. For example, in crude petroleum development China signed 33 crude petroleum contacts with 58 companies from 12 countries from 1979-86.[29] Through 1986, foreign business invested a total of $1.96 billion in offshore prospecting and exploration. Of a total of $3.0 billion pledged by U.S. investors during 1979-87, $940 million went to offshore crude petroleum development alone.[29]

Major Energy-Consuming Industries

In order to unify petroleum processing and the distribution of petroleum products under the jurisdiction of one agency rather than several, the Ministry of the Petroleum Industry (MOPI) was combined with the Ministries of Coal, Electric power, and Nuclear Industry to form a single, comprehensive Energy Ministry. The inability of MOPI to sustain foreign exchange earnings from exports of crude petroleum is believed to be a major consideration in this restructuring of the energy ministries.[30] This source further states that MOPI is being converted from a ministry to a corporation, the China National Petroleum Corporation. As such, it will be responsible for generating its own profits and covering losses and will become more sensitive and responsive to market conditions. Sinopec, 1 of only 4 Cabinet-level State corporations in China and its largest company, controls about 95 percent of China's petroleum refining capacity (i.e., 33 refineries with an average capacity of 3

" Ibid.
[27] The National Council for U.S. China Trade, *U.S. Joint Ventures in China: A Progress Report,* Washington, March 1987, pp. 133-142; Michael J. Moser, Ch. 3, "Foreign Investment in China: The legal Framework," pp. 90-132; and, James P. Dorian and David G. Fridley, op. cit., pp. 127-142.

[29] U.S. Department of Commerce, *Doing Business with China,* Overseas Business Reports, International Marketing Information Series, OBR 88 13, December 1988, pp. 32 and 33.
" The National Council for U.S. China Trade, *U.S. Joint Ventures in China: A Progress Report,* March 1987, pp. 98-101, states that from 1979 86 U.S. joint development investments have represented only 9 percent of the total number of U.S. investment contracts but represented 38 percent of the total value of U.S. commitments. For all countries during this period, the joint development form of the co-operative business arrangement for offshore crude petroleum represented 5 percent of the number of contracts and about 17 percent of the value of commitments.
[30] A paper entitled "The Effects of Price Volatility on China's Petroleum Trade and Investment" presented by Dr. Kim Woodward, President, China Energy Ventures, Inc. (Washington, DC) at the symposium on *Energy Markets and the Future of Energy Demand* on June 24, 1988, at the John Hopkins University Nanjing University Center for Chinese and American Studies Nanjing, China.

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million metric tons per year. The largest refinery has a capacity of 8 million metric tons per year). Sinopec also controls China's major petroleum and chemical-fertilizer plants. -Additional small chemical and fertilizer plants are scattered throughout China operating from local coal or natural gas fuel/feedstocks. These small plants are generally inefficient, with products of inconsistent quality. In the aggregate, Sinopec reportedly controls about 80 percent of China's refining, petrochemical, and chemical fertilizer production capacities. The Ministry of Petroleum Industry is responsible for remaining Chinese refineries all of which are small, (i.e., each with an individual capacity of less than a million metric tons annually).

At the beginning of 1985, Sinopec was also given the responsibility of marketing petroleum products. Sinopec is officially responsible for the export of petroleum products but presently shares this responsibility with Sinochem. Sinochem, under MOFERT, has the foreign marketing expertise and contacts which Sinopec lacks. Sinochem has been responsible for the international marketing of crude petroleum and petroleum products since 1950.

China's economic structure is based on the domestic supply of energy. Foreign trade makes up a small proportion of total energy supply and demand. Crude petroleum is not only an important domestic energy source, but it is also an important source of foreign exchange earnings, feedstock for China's petrochemical industry, and is a source of value-added petroleum products. The tabulation (in thousand of barrels per day), at the bottom of the page, shows China's production, exports, imports, and apparent consumption of crude petroleum, 1984-88.[31]

The following tabulation from official U.S. sources shows China's production of dry natural gas during 1984-88 (in trillions of cubic feet per year).[32]

Year	Production
1984	0.44
1985	.46
1986	.48
1987	.49
1988	.49

Production of natural gas increased by 11 percent from 1984-88, or at an average annual rate in excess of 2 percent. Natural gas currently supplies about 2 to 3 percent of China's energy needs.[33] Natural gas is needed not only as an energy source, but also as a feedstock for fertilizers and petrochemicals. However, industry sources believe that by the 1990s production of natural gas will have increased by about 9 percent to about 0.53 trillion cubic feet per year. By the year 2000, natural gas production in China is projected to reach 1.5-1.8 trillion cubic feet per year. China has no known foreign trade in natural gas, although plans are being discussed to liquefy a portion of the natural gas from the Yinggehai Basin offshore at Hainan Island and export it to Japan if customers can be found there.[34]

The tabulation (in millions of short tons), at the top of the next page, shows China's production, exports, and apparent consumption of coal, 1984-88.[35]

[31] Production data for 1986-87 are from U.S. Department of Energy, *International Energy Annual 1987,* Oct. 6, 1988, table; and 1988 production is from "Dip in Communist Output Overshadows Record China Flow," *Oil and Gas Journal,* Mar. 13, 1989, p. 23; foreign trade for 1984-86, from *International Energy Annual,* various years, table 7; and exports fro 1987-88 are from a paper by Dr. Kim Woodward, President, CEVCO, *The Effects of Prices Volatility on China's Petroleum Trade and Investment,* June 24, 1988.

[32] Production data for 1984-87 are from the U.S. Department of Energy, *International Energy Annual 1987, Oct.* 6, 1988, table 3; and, production data for1988 is from "Energy Shortages Becoming Acute," *Petroleum Economist,* November 1988, pp. 363-364.

[33] U.S. Bureau of Mines, *Minerals Yearbook 1986, Vol. III, Areas Report: International,* 1988, p. 216- 220; "Energy Shortage Becomes Acute," *Petroleum Economist,* November 1988, pp 363-364; "ARCO, China Agree to Proceed with Natural Gas Project," *The Asian Wall Street Journal, Oct.* 3 , 1988, pp. 1, 24; and, Petroleum Industry Research Foundation Inc., *Coal and Oil in China's Energy Sector,* New York, August 1988, pp. 3-4.

[34] Ibid.

[35] Production data for 1984 87 are from U.S. Department of Energy *International Energy Annual 1987, Oct.* 6, 1988, table 4; production data for 1988 are from "Greater Cooperation in Coal Development Sought," *Foreign Broadcast Information Service* (FBIS), Feb. 23, 1989, p. 35; export data for 1984 and 1985, U.S. Bureau of Mines, *Minerals Yearbook 1986, Area Report: International, vol.* III, 1988, p. 205; export data for 1986 and 1987, U.S. Department of Commerce, *Foreign Economic Trends and Their Implications for the United States: People's Republic of China,* International Marketing Information Series, FET 88-84, August 1988, p. 5; and data for 1988 from "Energy Shortages Becoming Acute," *Petroleum Economist,* November 1988, pp. 363-364.

Year	Production	Exports	Imports	Apparent consumption	Ratio (percent) of Imports to consumption
1984	2 296	447		1,854	0.3
1985	2 505	623	5	1,887	0.3
1986	2 620	570	7	2,057	0.3
1987	2 690	545	.7	2,152	0.3
1988	2 733	520	'7	2,220	0.3

Estimated by staff based on report by David Fridley, *From Toppers to Bottoms: A Survey of Chinese Refining,* East-West Institute, Hawaii, January 1988, pp. 28, 35, and 36.

Year	Production	Exports	Apparent consumption	Ratio (percent) of exports to production
1984	870	7	863	0.8
1985	937	6	931	.6
1986	959	11	948	1.1
1987	1,014	15	999	1.5
1988	1,058	19	1,039	1.8

China has a two-tiered coal production system. The Ministry of Coal Industry is the government agency in charge of the nation's coal industry and has about 2,200 mines under its jurisdiction.[36] In addition there are about lq,000 local coal mines operated by the State through provincial, municipal, or county authorities, as well as small coal mines which are privately or collectively (i.e., township and village) owned.[37] Trade sources report that coal production costs in China are low compared with those of other countries. Labor accounts for only about 20 percent of the total production costs of Chinese coal mines, compared with as much as 60 percent of production costs in other countries.

Refined petroleum products

Industry profile.—Foreign investment is not involved in China's crude petroleum refining industry, but is limited to upstream exploration, development, and production of crude petroleum. Official sources report that as of January 1, 1988 China had 40 operational refineries with the combined capacity to refine 2.2 million barrels of crude petroleum per day 3s Sinopec controlled 33 of these refineries. A series of political compromises prior to Sinopec's inception (July 1983) permitted small crude petroleum refineries (less than 20,000 barrel per day) to remain under the MOPI. In addition, 10 percent of all refinery profits were to be given to the local governments 39

The properties of China's crude petroleum require that it be heated during transport, which has influenced refinery location. The first group of refineries were built close to China's crude petroleum fields in the north and northeast; however, south and southwest China, which are crude- petroleum-poor, import petroleum products via rail over long distances.

Industry sources believe that the most serious problem now facing Chinese refineries is that they are long on distillation capacity and short on secondary processing capacity. China lacks the secondary processing capacity needed to dispose of the large amount of fuel oil generated from local crude petroleum. To overcome this problem, China has begun to invest in secondary processing units, primarily catalytic cracking units (each additional 1,000 barrels per day of crude petroleum distillation capacity generates 300 barrels per day of additional cracker feed and an additional 400 barrels per day of vacuum bottoms). China also lacks adequate hydrotreating capacity. Hydrotreating refers to a process in which undesirable materials, such as sulfur, are removed. One obstacle to the extensive use of hydrotreating is that the technology is too expensive to license, and China is waiting to develop its own technology:to Sinopec's upgrading program is heavily oriented towards gasoline and petrochemical production based on a mix of proven technology and the introduction of new technologies, primarily catalytic cracking. China's refining industry is moving from the simple fuel oil system to one where transport fuels are the major product.

During the Seventh Five Year Plan (1986-1990) China plans to add 450,000 barrels per day of primary distillation and 480,000 barrels per day of secondary capacity to its refined petroleum products capacity 4[2] Ttie upgrading program entails the construction of some ten imported alkylation units and five resid catalytic crackers.

The crude petroleum refining industry is the most profitable industry activity in China and a key profit center. The reason for this profitability is the relative price structure of crude petroleum and petroleum products. (i.e., crude petroleum is

[30] From a telephone conversation between a staff member of the U.S. International Trade Commission and the Chairman of Island Creek Corp. (a subsidiary of Occidental Petroleum) on Mar. 15, 1989. Island Creek is in a joint venture with the Chinese Government in Antaibao coal mine project in Pingshuo, 230 miles west of Beijing; and Westview Special Studies in Natural Resources and Energy Management, *China's Energy and Mineral Industries: Current Respectives,* ed. by James P. Dorian and David G. Fridley, East-West Center, Resources Systems Institute, Honolulu, Hawaii, published in Boulder, Colorado, 1988, p. 59. The ministry-run mines in China have accounted for about 45 percent of the total coal output in recent years.

[37] World Bank, China: The Energy Sector, Annex 3 *To China: Long-Term Development Issues and Options,* September 1985, p. 88; and James P. Dorian and David G. Fridley, pp. 45, 49, 50, 53, 62, 102, and 103.

[3] U. S . Department of Energy, *International Energy Annual 1987,* Oct. 6, 1988, p. 42.

[3] David Fridley and Fereidum Fesharaki, *China's Petroleum Industry: International and Domestic Policy Imperatives,* March 1987, East-West Institute, Honolulu, HA, pp. 2, 10-11.

[4] Dr. Kim Woodward, paper, *The Effects of Price Volatility on China's Petroleum Trade and Investment,* June 24, 1988, p. 10; David Fridley, *From Toppers to Bottoms: A Survey of Chinese Refining,* January 1988, op. cit, pp. 7-15; and *International Petroleum Encyclopedia,* 1988, vol. 21, p. 121.

[41] Ibid.

sold to refiners at $3-$4 per barrel; refined petroleum products are sold by refineries at current world prices) [42]

Domestic market.—China's . production, exports, imports, and domestic consumption of refined petroleum products in 1984-1988 are shown in the tabulation (in thousands of barrels per day), at the bottom of the page.[43]

China's exports of refined petroleum products are not surplus quantities in excess of domestic demand." Rather, China has limited its domestic market in order to obtain foreign exchange currency. Industry sources currently believe that China, in order to maximize its petroleum industry for its own internal needs, will virtually phase out exporting refined petroleum products. China's exports of these products accounted for over 100,000 barrels per day during 1980-85. Exports to the United States were minimal, accounting for less than 1 percent of total U.S. imports and consumption of refined products during 1984-88.

Dr. Kim Woodward, *The Effects of Price Volatility on China's Petroleum Trade and Investment,* op. cit., June 24, 1988, pp. 15-17; *China's Petroleum Industry in the International Context,* Westview Press, Boulder, Colorado, 1986, ed. by Fereidum Fesharaki and David Fridley, East-West Institute Honolulu, Hawaii, pp. 121-123; David Fridley and Fereidum Fesharaki, *China's Petroleum Industry: International and Domestic Policy Imperatives,* revised and updated, March 1987, East-West Center, Honolulu, HA, p. 2; and, Allen L. Clark, James P. Dorian, and David Fridley, "Problems and Prospects of China's Mineral and Energy Industries," Chapter 7 in *Asia Pacific Report 1988-1989,* 1989, ed. by Charles E. Morrison East-West Center, Honolulu, HA.

" Production, foreign trade, and consumption for 1984-86, U.S. Department of Energy, *International Energy Annual,* various years, tables 7-11.

" Dr. Kim Woodward, *The Effects of Price Volatility on China's Petroleum Trade and Investment,* June 4, 1988, pp.6-10; and, David Fridley, *From Toppers to Bottoms: A survey of Chinese Refining,* January 1988, pp. 16, 17, 23, 28-30; Petroleum Industry Research Foundation Inc.

China has a processing agreement with refiners in Singapore. Under the terms of this processing agreement, China is importing about 40,000 barrels per day of light products (which is approximately equal to the level of China's exports of these products). The future level of these imports, which will include both light and middle distillute products (mainly diesel fuel and gasoline), will be dictated by the future increase in China's distillation and conversion capability of the refining industry. In 1988, China's fuel oil upgrading capability was estimated at about 35-40 percent of its 2.1 million barrels per day distillation capability.[45]

Under terms of the processing agreement with the Singapore refineries, Sinochem paid domestic prices for the exported crude petroleum (i.e., about $5 per barrel) and a margin processing fee of $0.60 per barrel in 1985. This processing fee increased from $0.65 to $0.95 per barrel in 1986. The products were initially sold to the refiners or directly marketed overseas at world prices by Sinochem. In March 1986, Sinochem began reimporting its light and middle distillates (gasoline and diesel fuel) for several reasons: first, to relieve the domestic shortage of these products; and, second, because of the declining

"—*Continued*
Coal and Oil in China's Energy Sector August 1988, p. 7; and David Fridley and Fereidum Fesharaki, *China's Petroleum Industry: International and Domestic Policy Imperatives,* March 1987, pp. 21-24.

" Petroleum Industry Research Foundation, Inc., *Coal and Oil in China's Energy Sector,* August 1988, p. 7; and, "China's Problem: Economic Balance," *Oil and Gas Journal,* Aug. 22, 1988, pp. 32-33.

Year	*Production*	*Exports*	*Imports*	*Apparent consumption*	*Ratio (percent) of imports to consumption*
1984	1,473	135	5	'1,770	0.3
1985	1,524	148	4	'1,740	0.2
1986	1,822	180	40	'1.920	2.1
1987	[2]1,930	[3]99	[3]40	[2]1,871	2.1
1988	[2]2,040	[4]83	[4]40	[2]1,997	2.0

Data represent apparent consumption which includes internal consumption, refinery fuel and loss, and bunkering. For countries in the Organization for Economic Cooperation and Development (OECD), apparent consumption Is derived from refined product output plus refined product Imports minus refined product exports plus refined product stock changes plus other crude petroleum consumption (such as direct use of crude petroleum). For countries outside the OECD, apparent consumption is either a reported figure, or is derived from refined product output plus refined product imports minus refined product exports, with stock levels assumed to remain the same. Apparent consumption also includes, where available, liquefied petroleum gases sold directly from natural gas processing plants, for fuel or chemical uses.

[2] These data were estimated by a member of the United States International Trade Commission staff.

[3] Dr. Kim Woodward, *The Effects of Price Volatility on China's Petroleum Trade and Investment,* June 24, 1988, tables 1 and 2.

[4] " China's Petroleum Exports Face Slide," *Oil and Gas Journal,* Jan. 4, 1988, pp. 19 and 20; and Petroleum Industry Research Foundation Inc., *Coal and Oil in China's Energy Sector,* August 1988, pp. 7 and 8.

5-8

price on the world market for these products." Gasoline and diesel fuel are sold back into the domestic market at about world prices. The balance of the products, mainly low sulfur waxy residual fuel oil, is placed on the Singapore spot market to pay for transportation and processing fees.[47] Since all Pacific markets are showing a sharp increase in demand for light and middle distillate products, the cost of the processing arrangements may rise in the future.

Foreign firms operating in China may enjoy the lower cost of China's crude petroleum in investment arrangements,that are directed either towards export-oriented industries or towards the introduction of high-technology industries. Foreign firms are not invited into China's refined petroleum products industry." This highly profitable industry is the domain of China, primarily Sinochem for exports and Sinopec for processing and distribution (mainly domestic) of petroleum products.

During 1984-88 apparent consumption of refined petroleum products in China increased to an estimated 997,000 barrels per day, by about 16 percent, or an average annual growth rate of nearly 4 percent. In contrast to many heavy industries in China, growth in the downstream petroleum sector is demand driven (i.e., industry is growing 8-13 percent annually; transportation, 7-10 percent per year; and chemical fertilizers 15-20 percent per year). Expansion in air transportation, petrochemical production, and agricultural mechanization is averaging 10-20 percent per year in the aggregate. Rapid growth in these sectors is stimulating consumption of jet fuel, petrochemical feedstocks and diesel fuel.

Effects on production costs.-China's refining company, Sinopec, only pays the Chinese National Petroleum Corporation (formerly MOPI) $3.50 to $4.00 per barrel (1987-88 exchange rates). This price is in effect for the first 2 million barrels per day of crude petroleum output. In 1987, the U.S. refiners' average acquisition cost of domestic crude petroleum was $17.76, nearly $14.00 per barrel higher than the highest price paid by Chinese refineries for most of their feedstock."

It is difficult to assess China's production cost savings resulting from its pricing practices for energy materials such as crude petroleum. Since prices of goods besides natural resources, like crude petroleum, also are administrated, the discrepancies in the prices of these goods may either add to or reduce the cost savings provided by the relatively low-cost crude petroleum used as feedstock in China's refineries. The percent of total production cost of refined petroleum products accounted for by crude petroleum is not clear in China owing to the nature of a planned economy where market forces are secondary to State goals in determining prices and in setting allocation priorities.

Effects on competitiveness.-China exports refined petroleum products for foreign currency needed to purchase western technology, equipment, machinery, and materials necessary for the development of the national economy. Exports of petroleum products are priced at, or slightly below, international prices. However, as a result of increasing domestic demands and in its petroleum refining industry, China will have to cease much of its exports of refined products and China may become a net importer of certain refined petroleum products, such as diesel fuel.

China's transportation system is considered by many sources to be a serious bottleneck inhibiting China's expansion plans and industrial growth 50 Transportation prices, like natural resource prices, are also set by government agencies for the rail network (the only effective link between provinces and regions). Once these prices are in place, they tend to remain unchanged over prolonged periods of time. For transportation of coal, rail is the predominant transportation mode, and rail transportation per ton of coal costs about one-third of road transportation per ton of coal.[51] Based on a 1987 exchange rate of 3.71 yuan =U.S. $1.00, the typical transportation cost by rail in China amounts to about $2.69 per ton of coal; however, if road transport is used

[44] Dr. Kim Woodward, ***Trade and Investment in China's Petroleum Industry: Trends and Projections, 1981-1990;*** Petroleum Industry Research Foundation Inc., New York, January 1987, pp. 13, 15, 21 23, 28, and 29; David Fridlely, ***From Toppers to Bottoms: A Survey of Chinese Refining,*** East West Institute, Hawaii, January 1988, pp. 23, 28-32, 35-36; David Fridley, Fereidum Fesharaki, ***China's Petroleum Industry: International and Domestic Policy Imperatives,*** revised and updated, East West Institute, pp. 2, 5, 11, 20, 21, 23, 28, 30 and 32; Dr. Kim Woodward, ***The Effects of Price Volatility on China's Petroleum Trade and Investment,*** June 24, 1988, pp. 10, 16 and 17; and, Petroleum Industry Research Foundation, Inc., ***Coal and Oil in China's Energy Sector,*** August 1988, pp. 5-7.

[47] Ibid.

" Ibid.

[40] U.S. Department of Energy, ***Monthly Energy Review,*** November 1988, pp. 93 and 108.

[40] For example, China's transportation difficulties were discussed in the following representative sources: Allen L. Clark, James P. Dorian, and David Fridley "Problems and Prospects of China's Mineral and Energy Industries," Chapter 7 in ***Asia-Pacific Report 1988-1989,*** 1989, ed. Charles E. Morrison, East- West Center, Honolulu, HA, pp. 11 and 13; U.S. Department of Commerce, ***Foreign Economic Trends and Their Implications for the United States: Peoples Republic of China,*** FET 88-84, August 1988, pp 3 and ***5; China's Petroleum Industry in the International Context,*** 1986, Westview Special Studies, eds. Fereidum Fesharaki and David Fridley, East-West Center, Honolulu, HA, pp. 9 and 10; James P. Dorian and Allen L. Clark, "China's Energy Resources: Potential Supply, Problems, and Implications," ***Energy Policy,*** February 1987, pp. 86-89; and, David Fridley, ***From Toppers to Bottoms: A Survey of Chinese Refining,*** January 1988, East-West Institute, pp. 11 and 13.

[61] World Bank, ***China the Energy Study,*** Annex 3 to ***China: Long-Term Development Issues and Options,*** September 1985, pp. 75-79, 93, 101-102, 118; and, World Bank, China: Long Term Development Issues and Options, October 1985, pp. 82-85.

over long distances, this cost can exceed $8.00 per ton. Retail prices for crude petroleum and coal include transportation costs, which varies from region to region. Transportation of crude petroleum, petroleum products, and natural gas via pipelines reportedly does not face major bottlenecks at present re

Effects on resource allocation.—Most of the crude petroleum obtained by China's refineries was at costs below world market levels. However, the sharp decline in the world price of crude petroleum and refined petroleum products coupled with an oversupply of both on the world market resulted in a sharp decline of China's exports of refined products. After the world price decline in 1986, about half of the petroleum refined for China in refineries in Singapore was returned for domestic use. Prior to that time, nearly all of this product was sold in the world market at the expense of domestic demand. Industry sources familiar with both China's petroleum industry and China's domestic demand, believe that in the 1990's China will cease exporting refined products and will become a net importer of these commodities.

se Ibid.

Chapter 6

Soviet Union

The Soviet Union is the only major industrialized nation that is energy independent. It has the largest proven crude petroleum reserves outside the Persian Gulf, and 40 percent of the world's natural gas reserves. The Soviet Union had estimated proved reserves of 58.5 billion barrels of crude petroleum and 1,500 trillion cubic feet of natural gas by year-end 1988. Energy production grew by about 3 percent between 1987 and 1988, absorbing about 15 percent of total Soviet investment.[1]

The energy sector is state owned and controlled through a hierarchial arrangement of government ministries, production associations, and enterprises. During the planning process production quotas and prices are established, and investments planned. The controlling "super-ministry" is the Bureau for the Fuel and Energy Complex (established as part of the Gorbachev economic reforms in 1987), which reports to the Council of Ministers of the U.S.S.R., and which supervises and coordinates the work of 6 committees related to energy matters and 16 energy-related ministries.

Beneficial Government Practices

Pricing practices for energy-related commodities in the Soviet Union• have sought to maximize revenues in foreign currency by facilitating more competitively priced exports of crude petroleum and petroleum products? There are two types of prices in the U.S.S.R., one for export and one for the domestic market. Soviet export prices for crude petroleum, petroleum products, ammonia, carbon black, and • other petrochemicals are often set below prevailing prices in their export markets. This pricing practice provides the Soviet petroleum-refining industry with a competitive advantage and allows it the pricing flexibility to retain or expand its market share. The revenues generated by the export of petroleum and natural gas accounted for more than 90 percent of Soviet export revenues.

Domestic prices for fuels are differentiated by a three-tier system of enterprise wholesale prices, state procurement prices, and retail prices. Prices for the domestic market are often lower than the foreign market price because they are based on relatively low-cost natural resource inputs. One of the main principles of domestic price formation is the establishment of interrelated prices for all fuels, based on coal prices, calculated in terms of a standard unit of account for fuel.[3] The effect of this fuel price system is to link prices of crude petroleum and natural gas to coal production costs! The latest price revision for Soviet fuels was made in 1982, which raised the prices for fuels, electricity, coal, and natural gas by 40 to 50 percent. Another price revision is scheduled to take effect on Jan. 1, 1990, which is expected to raise prices from 20 to 130 percent above current levels .e The average nationwide price for coal in 1982 was $25.32 per metric ton, representing a 42 percent increase from price levels of 1967-81. Retail prices to the public remain at the 1948 level .e The average price for crude petroleum was about $6 per barrel in 1982. The average price for gas in 1982 was about $0.86 per thousand cubic feet (reflecting a price increase of about 45 percent above 1967-81 levels).?

Wholesale prices form the basis for domestic transactions between enterprises in the coal, petroleum, and natural gas industries. Retail prices are used in selling fuel, gas, and fuel oil to the public. Wholesale prices are based on the sector's average production costs by basin and

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' "The Soviet Economy in 1988: Gorbachev Changes Course," A report by the Central Intelligence Agency and the Defense Intelligence Agency presented to the Subcommittee on National Security Economics of the Joint Economic Committee, April 14, 1989, p. 34. The percentage of investment absorbed by the energy sector may be understated since it does not include the costs of building gas pipelines or constructing electricity transmission lines.

² The Soviet Union is the only major industrial country whose policy is to promote continuous absolute growth in mineral production so as to achieve self-sufficiency for itself and its allies, and in addition, to produce minerals to export for• hard currency. This policy is not guided primarily by aspects of comparative advantage or fluctuations in the world market price for minerals. U.S. Bureau of Mines, *Minerals Yearbook,* 1986, p. 859.

• Bella Feygin, "Economics and Prices in the Soviet Fuel and Energy Industry," the Monograph Series on Soviet Union, Delphic Associates, January 1984, p. 13. The standard unit of account for fuel is a ton of "standard fuel," defined as 7 gigacalories or 27.8 x 10• Btu. The average conversion coefficients are 1 ton of coal equals 0.702 tons of standard fuel; 1 ton of oil equals 1.43 tons of standard fuel; 1000 cubic meters of gas equals 1.195 tons of standard fuel.

⁴ Since coal production costs are rising as production shifts to deposits in Siberia, oil and gas prices rise as well, although oil and gas prices rise faster than their actual production costs. The excess profits are eliminated by means of a fixed payment or turnover tax. The relationship of coal, gas, and fuel oil, expressed in kilocalories, for the U.S.S.R. in 1981 was 100:89:102.

• Gertrude Schroeder Greenslade, Letter, University of Virginia, Charlottesville, VA.

• Bella Feygin, "Economics and Prices in the Soviet Fuel and Energy Industry," the monograph series on Soviet Union, Delphic Associates, January 1984, p. 35.

⁷ Ibid., p. 52. One of the difficulties of the analysis is the difference between actual costs and prices. Both sets of prices are indexed to coal production costs, and may not express true production costs. Soviet cost estimates for natural gas extraction are about Rbl 2.40 per thousand cubic meters plus Rbl 5.80 for transportation. Using the Soviet definition of factor cost (current operating costs plus 12 percent of current capital investment), estimated total costs in rubles per ton standard fuel equivalent for gas, oil, and coal during 1986-90 would be 13.00, 37.75, and 13.66, respectively. Arild Moe and Helge Ole Bergesen, "The Soviet Gas Sector: Challenges Ahead," in NATO Colloquium, pp. 158-159. We have used an extilafinge rate of $1.50: Rbl 1.00.

type of deposit (including certain expenses such as those applicable to geologic exploration and social insurance) and planned profit rates .s Costs vary across zones and are determined by the depth of the _deposit, - the well flow, the petroleum's qualities (wax, sulphur, and volatile substances), and the location of the deposit. At various deposits of crude petroleum in the U.S.S.R., production costs varied by a factor of 20; for gas, production costs varied by a factor of 2.[9] There are two price lists, one for settling accounts between producers and supply organizations (with prices quoted f.o.b. point of origin), and another list of uniform wholesale prices for the country as a whole, or by zone, used for transfers between supply or sales organizations and consumers (with transportation paid f.o.b. point of consumption).[10] Wholesale price relationships change over time, and vary by region. The differentiation is to achieve a fuel balance based on regional demand. Territorial price differentiation also exists because of a great variation in production costs, and because transportation costs vary considerably by region and distance and form a large share of the final cost for the consumer. Foreign joint-venture partners gain access to petroleum and natural gas through the supply organizations at either the industrial wholesale price or a price lower than that available on the world market.

The State Committee on Pricing of the U.S.S.R. Council of Ministers determines enterprise and industrial wholesale prices and retail prices for coal, gas, petroleum, and basic refinery products, as well as rates for electric power. Intra-industry transfer prices (i.e., prices at which output is transferred within a fuel-producing Ministry) are determined by the ministries, - and rates for thermal energy are determined by local price-setting bodies.[11]

The State Committee on Pricing has been instructed to narrow the differences between international and domestic prices, as well as to move toward the future use of a single unadjusted exchange rate to establish the domestic prices of imports and exports.[12] Crude petroleum and natural gas prices will then be roughly in line with world market prices while coal prices will exceed world market prices (expressed in ruble terms at current official exchange rates).[13] This policy envisions a shift of resources away from the Soviet refinery industry to alternative sources of energy (such as natural gas), and is in line with stated intentions to decrease the value and tonnage of natural resources within the current composition of exports.

Along with the price reforms, the use of long-term contracts between enterprises is to be expanded so that by 1990 such contracts will encompass 80 percent of total industrial production of the relevant goods (versus 27 percent coverage in 1980). These will be mostly in the areas of intermediate and capital goods. This may have the effect of reducing barriers to participation in the Soviet economy by foreign equity joint ventures due to the materials-balance-planning system. Additionally, a joint venture which consumes Soviet crude petroleum, fuel, or natural gas may benefit since it is an offshore entity and may purchase natural resources in foreign currency or rubles, thereby benefiting from price and exchange flexibility.

Foreign Investment Policies

The U.S.S.R. has taken actions to liberalize the terms under which foreign investment can occur in the country, including equity investment in projects related to natural resources. The liberalization is part of an overall revision of Soviet investment and trade policy in recent years, resulting in the centralization of policy-making and management functions in Soviet foreign trade and the decentralization of decision-making authority in commercial transactions[14] that expanded the legal basis of Soviet organizations to engage in foreign trade transactions. The aim is to focus foreign investment in specific sectors and projects, rather than viewing imports as a means for filling existing production or supply gaps, to enhance domestic technological and managerial capabilities,[15] and to obtain access to western markets, credit facilities, and international organizations such as the GATT.Is

The legal basis for the joint venture is still evolving. It was established by decrees of Jan. 13, 1987 of the Presidum of the U.S.S.R. Supreme

• One wholesale price is established, based on the average production costs of all the enterprises—mines and pits—in a given field or zone, and specific prices are influenced by the quality of the given mineral.
• Bella Feygin, "Economics and Prices in the Soviet Fuel and Energy Industry," the monograph series on Soviet Union, Delphic Associates, January 1984, p. 12.
'• The supply and sales organizations absorb the difference between wholesale and antra-industry transfer prices and even out differences in actual transport expenses involving the wholesale price f.o.b. point of consumption.
" Bella Feygin, "Economics and Prices in the Soviet Fuel and Energy Industry," the monograph series on Soviet Union, Dephic Associates, January 1984, p. 9.
[12] "Restructuring the Soviet Foreign Trade System," H. Stephen Gardner, in *The Columbia Journal of World Business,* Winter 1987, p. 10.
" Gertrude Schroeder Greenslade, Letter, University of Virginia, Charlottesville, VA.
" Richard Dean, "Understanding the Reorganization of the Soviet Foreign Trade Apparatus," *Legal and Practical Aspects of Doing Business with the Soviet Union,* p. 178.
'• Ibid., p. 180.
"[0] CIA/DIA report, p. 23. Additionally, it should be noted that the Soviet Union stated that it would seek observer status in the GATT in March 1986, and in August 1986 requested to participate in a GATT round. The GATT trade ministers have not formally acted upon the request, which was made at the same time as the Soviet foreign trade laws were changed.

Soviet and the U.S.S.R. Council of Ministers, and has been subsequently amended several times (most notably on Sept. 17, 1987; June 4 and Nov. 4, 1987; and Dec. 2, 1988).[17] These allow the establishment of joint enterprises with Western companies for the production of goods for export or to replace imports. However, if a joint venture sells primarily on the domestic market for the initial 5 to 10 years, an expectation exists that it will export in the future. A joint venture is permitted to trade directly with foreign entities and with domestic enterprises engaged in trade with foreigners. This represents a change from previous regulations which restricted the joint venture to using a foreign trade organization as an intermediary on both the domestic and foreign markets. The joint-venture access to foreign exchange is tied to the capital contribution of the western partner and the exports of the joint venture.[18] One problem area, and a main barrier to foreign investment, is that of repatriation of profits. The Soviets have stated the goal of making the ruble fully convertible by 1991 although currently it is not. As an interim step, Soviet authorities have experimented on a very limited basis with foreign currency auctions; a group of six U.S. companies, the American Trade Consortium, has recently signed a framework agreement that will allow the members to pool their hard currency revenues.

With regard to equity ownership, foreigners were previously limited to 49-percent ownership and the managing director was to be a Soviet citizen. The percentage limitation has been eliminated, however, and other restrictions on control and management have been relaxed. In most joint ventures the Soviets retain a percentage of ownership higher than 51 percent. However, in several newer ones registered after December 1988 under the new regulations, the foreign partner has majority ownership. The Soviet Government currently encourages foreign equity investment within certain limitations as to scope. State authorities review each joint venture in its planning and feasibility study stages, screening the joint venture for its purpose, the foreign partner's contribution, and its potential contribution to the economy, state budget, and exports. Changes in the regulations now allow a joint venture to be approved by a regional supervisory organization, although they must be registered with the Ministry of Finances of the U.S.S.R.; prior to the revision the Council of Ministers of the U.S.S.R. was the sole grantor of approval. The main areas of Soviet interest in joint ventures are the output of chemicals for use as pesticides, dyeing agents, chemical fibers, and individual types of machines, as well as the pulp-and-paper, consumer, and food industries.la

The joint-venture regulations provide an incentive for expansion of Soviet-Western industrial cooperation beyond the various forms of nonequity cooperation (direct compensation, countertrade or buyback, or coproduction arrangements) that have existed since the 1960s, in terms of equity financing and profit sharing, Examples of nonequity cooperation include the Soviet-Western European natural' gas pipeline, Soviet-Japanese cooperation in forest development, and various Finnish mineral and wood projects in the Kola Peninsula. Another form of nonequity industrial cooperation is coproduction, involving the specialized production of parts, a specific product line, or just research and development. The bulk of coproduction agreements have involved delivery of plant and equipment and production specialization in the chemical industry. In broad terms, the joint-equity ventures are most similar to buyback agreements with the western partner repatriating its share of the profits from the export of the commodity that the joint venture produces.[20]

[17] Decree of the Presidium of the U.S.S.R. Supreme Soviet, No. 6362-XI, "On Questions Pertaining to the Establishment in the Territory of the USSR and Operation of Joint Ventures, International Amalgamations and Organisations with Participation of Soviet and Foreign Organisations, Firms and Management Bodies" of Jan. 13, 1987; Decree of the U.S.S.R. Council of Ministers, No. 49, "On Establishment in the Territory of the USSR and Operation of Joint Ventures with Participation of Soviet Organisations and Firms from Capitalist and Developing Countries," of Jan. 13, 1987; Decree of the State Committee for Supplies, No. 74, "Supplies of Materials and Equipment to Joint Ventures Established in the Territory of the USSR with the Participation of other Countries and Foreign Firms and Marketing of their Products," June 4, 1987 (This was amended to include firms from capitalist countries on Nov. 4, 1987). Decree of the U.S.S.R. Council of Ministers, "On Additional Measures to Improve the Country's External Economic Activity in the New Conditions of Economic Management," of Sept. 17, 1987. Decree of the U.S.S.R. Council of Ministers, No. 1405, "On the Further Development of the Foreign Economic Activity of State, Cooperative and Other Public Enterprises, Associations and Organizations," Dec. 2, 1988. There have been a number of clarifying instructions to the Ministry of Finance of the U.S.S.R. on tax questions, as well as rules and regulations adopted by regional and All-Union management bodies pursuant to the charters of individual joint ventures.

[18] Certain joint ventures which operate entirely on the Soviet market, such as Pizza Hut, earn foreign exchange by selling partly to foreigners in Moscow (or Soviets who have access to convertible foreign exchange).

[20] Keith M. Dunn, "Reorganization of the Management of Foreign Economic Relations of the USSR," *North Carolina Journal of International Law and Commercial Regulation,* No. 12, Spring, 1987, p. 184.

[20] In order to service the debt load on the loans, the western partner usually requires that the Soviet Ministry partner will guarantee the supply of whatever quantity of raw materials is needed. The prices of such inputs could be a percentage of the final product price in the market of destination less various factors, or fixed for a period of time, or tied to some indicator, but has to be6-3 sufficiently low in order to attract the necessary capital.

A partial list of joint ventures registered between January 1987 and December 1988 indicates a concentration of projects in the consumer good, instrumentation, computer, and machine tool sectors.[21] There are some joint ventures involved in supplying equipment for natural resource projects. One project involves the re-equipping of an existing ethylene glycol plant, and another project modernizes process controls in the petroleum refining and petrochemical industries. Both projects obtain repayment via the export of petroleum products or industrial chemicals. Although there were no joint ventures registered for the production of crude petroleum or natural gas as of December 1988, several letters of intent involving the development of petroleum and gas fields, and construction of petrochemical complexes were under consideration. A letter of intent represents an initial part of the registration process, which is usually followed by a feasibility study. The letter agreement represents Soviet acceptance of the venture's design and aim, and establishes the parameters for the venture. There have been about 190 joint .ventures registered, of which 164 were with Western partners;[22] these joint ventures account for only a small proportion of the Soviet economy and exports.=

Most of the projects registered involve capital contributions of less than $10 million. Many of the ventures registered before December 1988 are working toward modernizing or adding equipment to existing facilities, rather than building new facilities.[24] There were a number of joint ventures registered or for which letters of intent were signed after December 1988 providing for investment in new facilities. These were reportedly delayed to accommodate an important change in the legislation in December 1988 liberalizing equity participation and control that a western company may have.

Under Soviet law, access of a joint venture to raw materials, energy, labor, or other resources as well as market access for its products is negotiated with the joint venture's Soviet partner; this consists of either the ministry overseeing the production of the raw material input or the enterprise which has an allocation from the Soviet supply organization for raw materials, transportation facilities to enable exports of finished goods, or imported supplies.= • Simply stated, the Soviet partner would have to guarantee raw materials for the joint venture from its own allocations, since State allocation of energy resources, including compiling material balances and plans for supply and distribution, reportedly will continue to cover about 90 percent of the output of the fuels ministries and most chemicals.= Most industrial ministries and certain enterprises were given the right to conduct foreign trade in 1986-87. These organizations are the joint-venture partners from the Soviet side. Significantly, the requirement that the joint venture conduct domestic and foreign trade through one of the Soviet foreign trade organizations (including the purchase of raw materials) has been eliminated, and the joint venture independently may conduct foreign economic operations.

It appears, given the nature of the investment, that prices for materials bought by the joint venture will be domestic prices. Depending upon how high a priority the project enjoys, and how it is negotiated, the venture may be able to pay for supplies in rubles or foreign currency, and may be able to negotiate locally for supplies or sales.

There are provisions for the joint venture receiving credit on "commercial terms" from the Soviet Bank for Foreign Economic Relations, or with consent of this bank, from foreign banks and other institutions. Capital needs, in ruble terms, may be obtained on credit from the USSR State Bank (Gosbank). Reportedly the five largest petrochemical projects will have an estimated cost of $38 billion, leading the companies involved to ask the Soviets for credit and export guarantees, which reportedly have not been granted. Current U.S. regulations prohibit U.S. Government financing or issuance of export guarantees. The magnitude of the projects may also present a problem since building all five ventures might strain the ability of markets to absorb the output.V

Alan B. Shen, "Joint Ventures in the USSR: Soviet and Western Interests with Considerations for Negotiations," *Columbia Journal of World Business,* summer 1988, pp. 38-41; and "List of Joint Ventures Registered by the Ministry of Finances of the USSR," *Economischkaya Gaseta.*

Gertrude E. Schroeder, "Anatomy of Gorbachev's Economic Reform," *Soviet Economy,* No. 3, 1987, p. 11.

so Ibid.

" For example, Combustion Engineering joined with the Ministry of Oil Refining and Petrochemical Industry to provide control systems and instrumentation for several chemical p ing facilities; Mineraloil Roschtoff Handel (C joined with Nizhnekamskeneftechim to upgrade equipment and add an ethylene cracker to the existing ethylene glycol production facility at Nizhnekamsk. See *Chemical and Engineering News,* Apr. 3, 1989; and *Economischiskaya Gaseta,* "List of Joint Ventures Registered by the Ministry of Finances of the USSR," various issues.

o° Russell H. Carpenter and Bradford L. Smith, "U.S.-Soviet Joint Ventures: A New Opening in the East," *The Business Lawyer,* Nov. 1987, p. 86.

Gertrude E. Schroeder, "Anatomy of Gorbachev's Economic Reform," *Soviet Economy,* #3, 1987, p. 231.

"Cold Feet in Siberia," *Business Week,* Mar. 27, 1989, p. 48.

Major Energy-Consuming Industries

The industries benefiting from two-tier pricing include all industries obtaining crude petroleum and natural gas at below world prices. Natural gas serves as a fuel and also contains components which are used as raw materials in the production of plastics, mineral fertilizers, and other products. Increases in the production of coal and natural gas, used as fuel, allow the conservation of petroleum for both petrochemical use and for export (as crude petroleum or as refined product).

Expansion of the Soviet Union natural gas industry has resulted in increased ammonia production. Natural gas represents more than 90 percent of the raw material input cost for ammonia production in the Soviet Union, and ammonia production accounts for about 40 percent of natural gas consumption in the Soviet Union.

Crude petroleum is produced predominantly in West Siberia. This production is relatively high in cost because of the harsh environment in which it is extracted and the long distances it must travel for processing or export. In 1988, Soviet production of crude petroleum was 12.5 million barrels per day. Production has risen from 12 1 million barrels per day in 1980, but the rate of increase is slowing due to extraction and infrastructure problems. Exports in 1987 totaled 2.7 million barrels per day; Eastern Europe, primarily the German Democratic Republic (East Germany), was the principal market.=

Natural gas production in 1987 increased by more than 150 percent over 1980 levels to 25.7 _ trillion cubic feet, with increased production from gasfields in northern West Siberia continuing to - account for nearly all the growth. The production of natural gas is expected to surpass that of crude petroleum by 1990. In 1988, natural gas represented more than 38 percent of the primary energy balance, as the development of an extensive infrastructure has allowed its transmission and domestic consumption to expand. Further expansion will apparently require construction of local distribution pipelines as well as the conversion of existing equipment to gas and wider use of new gas-fired equipment at consumers' facilities. Increased consumption of natural gas in the domestic market is also planned for motor fuel constituents and methanol production. The expansion of gas production is due to increased production from four Soviet fields (Yamburg, Karachaganak, Sovetabad, and Astrakhan), which are being connected to the Soviet gas system (natural gas from the Yamburg field is additionally exported to Eastern Europe). Exports of natural gas in 1986 are estimated at 2.8 trillion cubic feet and were piped primarily to Eastern Europe and to Western Europe.

Raw coal production totaled 772 million metric tons in 1988, 602 million metric tons of which was anthracite and 170 million metric tons of which was lignite. Increases in raw coal production continue to come from open-pit lignite (or brown coal) mines in the Eastern U.S.S.R.. To supply the main energy-consuming areas of the U.S.S.R., which are in the European area, fuel and energy complexes are being built near the coal sites of Ekibastuz, Yuzhno-Yakutsk, and Kansk-Achinsk. The intention is to transmit the power the high consumption areas as well as to construct plants in ferrous and non-ferrous metallurgy, chemical and petrochemical, and paper and pulp industries near the coal areas. The Soviets have also studied the alternatives of developing coal slurry pipelines (the first is about 3 years late in construction and completion is scheduled for 1990), and coal gasification and liquefaction 2[9]

Ammonia

Industry profile.—The ammonia industry in the U.S.S.R. is under the direction of the Ministry of Fertilizer Production. For the 12th 5-year plan, covering the period 1986-90, fixed capital in material production was planned to grow by 5.4 percent per year, and the Soviets are continuing the investment share of the agro-industrial (including fertilizer production) complex as a whole along the same lines developed in the previous 5-year plan?" There are no increases in the labor force planned,, Employment data in the industry are not available.

Ammonia production capacity has increased in the U.S.S.R., reflecting the effects of the renovation of older plants and expansion of throughput capacity from 1,300 tons per day to 1,700 tons per day at 16 plants. Additionally, feasibility studies have been conducted aimed at renovating 12 facilities with Japanese and French assistance[32] in 1987, two Japanese firms contracted to renovate five ammonia plants in the U.S.S.R., with the work to be partly compensated for by deliveries of ammonia .= Currently, about 40 modern ammonia producing facilities with capacities exceeding 1,300 tons per day of ammonia produce more than 60 percent of the

• "Energy Strategy Based on Cu," *Petroleum Economist,* October 1988, p. 333 334 and "011 Exports by Volume and Country." *Petroleum Economist, January* 1989, p. 8.

"U.S. Bureau of Mines, *Minerals Yearbook,* 1986, p. 887.

" Philip Hanson, "The Soviet Twelfth Five Year Plan," in *The Soviet Economy: A New Course?,* NATO Colloquium, Brussels. 1987.

" Silvana Malle. "Soviet Labor-Saving Policy in the Eighties," NATO Colloquium, p. 71.

R U.S. Bureau of Mines, *Minerals Yearbook,* 1986, p. 883.

' U.S. Bureau of Mines, *Mining Annual Review-1988,* "Mineral Industries of the U.S.S.R.," p. 7.

country's ammonia .[34] The largest ammonia complex is located at Togliatti, from which the Soviets export via the port of Odessa. Togliatti accounted for about half of the increase in capacity in the Soviet Union during 1980-85. Total production capacity in the U.S.S.R. is about 25 million tons.

Domestic market.—The following table 6-1 shows Soviet ammonia data for 1985-87.

Ammonia exports to Western nations are based on compensation agreements where Western technology and sophisticated equipment are exchanged for ammonia exports. Since the percentage of the price that is tied to the compensation is unknown, it is difficult to assign a true value to these exports.

The U.S.S.R.'s share of world production was 18 percent in 1982, although it accounted for 30-36 percent of the world's total ammonia exports. Soviet exports to the United States are based on a compensation agreement with one company. U.S. imports of anhydrous ammonia for fertilizer from the U.S.S.R. declined, but averaged 28 percent of total imports, during 1983-87. Possible reasons for this decline include the fall in prices, from about $175 per ton to $90 per ton f.o.b. Gulf Coast during the period, and the overall reduced consumption of fertilizers and reduced planted acreage[35] U.S. imports from the Soviet Union in 1988 were valued at about $63 million and accounted for about 3 percent of apparent U.S. consumption.[36]

" Ibid. The Soviet journal, *Promiisl'nost r SSSR,* indicates that the largest facilities, with capacities of 400-450,000 metric tons per year, produced about 15.6 million metric tons of ammonia in 1987, accounting for about 64 percent of total production.
I* U.S. Bureau of Mines, *Mineral Commodity Summaries,* 1988, p. 110.
" Ibid.

Although the United States is the largest single importer of ammonia from the U.S.S.R., the U.S.S.R.'s total ammonia exports to Eastern Europe were more than double those to the United States during 1982-86.

Effects on production costs.—Natural gas represents more than 90 percent of the raw material input cost for ammonia production and is available to Soviet producers for approximately S2 per thousand cubic feet,[37] which represents a cost savings of about 51.00 per thousand cubic feet when compared with U.S. producers. This in turn translates into a production cost advantage of about $60 per short ton of ammonia (or 65 percent of prices prevailing in the U S market in 1987). Other cost differences that result from differing labor costs, capital costs, and alternative production techniques would, however also affect comparative costs.

Effects on competitiveness.—The production cost advantage cited above is partially offset in the U.S. market by the cost of transportation from the U.S.S.R. to the United States. In 1988 this is estimated to have equaled $20 per ton, which represents 22 percent of the U.S. market ammonia price at yearend in 1987.

Effects on ***resource allocation.—Countries*** such as the U.S.S.R. which produce large amounts of natural gas have generally developed more value-added industries that use gas intensively, such as the ammonia industry. The competitiveness of such industries is, however, enhanced to the extent that prices are set at preferential levels.

" According to U.S. Department of Energy, the average price of natural gas for industrial consumers in 1987 and 1988 was $2.95 per thousand cubic feet. Cost estimates derived by the U.S. Dept. of Commerce (CIR Staff Paper No. 20) for Soviet oil and gas are about SI per thousand cubic feet.

Table 8-1
Ammonia: Soviet production, exports, Imports, and apparent consumption, 198547
(In thousands of tons)

Year	Production'	Exports'	Imports	Apparent consumption
1985	22,167	1,269	issi	20,898
1988	23,818	1.563'		22,255
1987	24.232	1,653		22.579

, Promisilnost' SSSR, Statistiskil Sbornik, 1988, Gosudwstvenli Statisticidi Komitet SSSR.
I U.S. Dept. of the Interior, *Minerals Yearbook,* 1986, and *Mining Annual ReWew,* 1988 (1987 export data are estimated); Soviet sources do not publish data for ammonia exports by quantity.
[a] Not available. Estimated to be negligible.

Chapter 7

The Effects of Pricing Policies for Natural Resources on the Production Costs of Energy-Intensive Industries

In this chapter, input-output analysis is used to estimate the effects of government pricing policies for natural gas and fuel oil on the production costs of commodities using these natural resources as inputs. Moreover, from the cost advantage estimated, a possible price range is calculated for the product. Finally, an estimate is made of the increased value of total imports into the United States resulting from the lower import prices for the product. Estimates are presented as ranges since precise figures are not available.

Methodology

The input-output analysis used here assumes that all inputs enter production in fixed proportions. Moreover, it is assumed that the proportion of inputs used in other countries is the same as that in the United States.[1] For some industries these assumptions are reasonable if the analysis is confined to the short term so that input substitution is limited and if the level of technology and resources is similar across countries. Even in the short term, however, some producers that use natural resources intensively may vary their input mix, therefore, the results should be interpreted with care.

The prices for natural gas and fuel oil used in this analysis are those thought to be paid by industrial users as inputs into their production process. It is assumed that any difference in price due to transportation costs or other costs from the wellhead are embodied in the final price charged to the industrial consumer. The analysis in this chapter is limited to Mexico, Saudi Arabia, Venezuela, and Indonesia because more recent pricing data were available for these nations. Canadian producers of energy-intensive products currently pay prices which are often slightly higher than world levels for natural resource requirements. Prices for Canadian inputs are roughly equal for U.S. and Canadian producers. No cost advantage exists due to government pricing policies for Canadian producers versus foreign investors. Therefore, cost-savings estimates for Canada are not calculated in this chapter.

The industries that are identified as those that use natural resource inputs relatively intensively are derived from table 1-4 in Chapter 1. This list is expanded by similar 4-digit SIC industries that fall under corresponding 2-digit SIC groups. Once the industries were chosen, the 4-digit SIC industries were concorded with input-output industries resulting in a total of 27 input-output industries in 8 input-output groups. To estimate the amount of natural gas and fuel oil that is used in the production process, an input-output table constructed by the Department of Commerce is utilized. The value of the direct requirements of natural gas and heavy fuel oil per dollar of output is used as the input coefficient. Table 7-1 presents the industries examined with their respective input coefficients.

Once a cost advantage is estimated with the input coefficient and the difference in the prices of the inputs, the effect on the price of the final product can be estimated. Local producers .in these industries are likely to pass part of the cost advantage on to foreign buyers to gain market share. Given a price differential for the final product, the likely response to this price can be estimated using the import demand elasticity and the export supply elasticity. However, it should be noted that even where good data on input prices are available, estimates of price differentials on the final product are difficult to accurately quantify for a variety of reasons such as quality of the product, transportation costs, and other costs of trade. The effects of foreign government pricing policies on the price and quantity of a commodity imported into the United States depend on the extent foreign producers pass on their savings and on the extent that U.S. consumers are responsive to changes in the price of the imported product. The willingness of producers in the exporting country to supply to the United States at given prices is captured by the export supply elasticity, and the willingness of U.S. consumers to increase purchases of a commodity in response to a lower price is captured by the import demand elasticity.

The reduction in the export price of a commodity is a proportion of the reduction in unit production costs caused by goVetnment

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' The direct effects on production costs per unit of output in industry is given by the equation:

$$Aci = \sum_{k}^{Er} Aik\ pk \qquad (1)$$

where AtIci is the change in production costs for industry i, r ik is the ratio of the value of the primary input k to the value of output in industry i, and Apk is the difference in price in the export and domestic markets of primary input k resulting from these pricing policies. Since this study is primarily concerned with estimates of the percentage change in cost per unit of output, equation I can be expressed as:

$$Aci/C\ i = Er\ (Aik\ /pk\ )\ pk \qquad (2)$$

when C i represents the production costs for industry i and p k is the export or world price of primary input k.

Table 7-1

Direct Input requirements of natural gas and refined petroleum per dollar of output in energy-Intensive Industries and the Import demand elasticity

Industry	Natural gas	Refined petro-leum	Import demand elas-ticity
Chemicals and selected chemical products			
industrial inorganic and utio chemicals	0.03135	0.02085	-8.714
Nitrogenous and photwheft fertilizers	0.05818	0.01419	-0.917
Agricultural chemicals, nets	0.01398	0.00978	-0.917
Carbon black	0.07312	0.36711	-10.679
Plastics and synthetic materials			
Plastics materials and rosins	0.01152	0.02120	-5.085
Synthetic rubber	0.01411	0.00438	-5.085
Cellulosic man-made fibers	0.02433	0.02100	-5.085
Organic fibers, nom:Mull:olio	0.00343	0.01673	-5.085
Petroleumreflnkq and related itidustries			
Petroleum	0.01613	0.06551	-0.794
Rubber and miscellaneous plastics products			
Miectralansous plastics products	0.00320	0.00667	-8.028
Glass and glass products			
Glass and glass products except containers	0.03380	0.01141	-3.543
(daiscontainers	0.04915	0.01958	-2.689
Stone and clay products			
Cement, hydraulic	0.04611	0.02930	-2.145
Brick and structural clay the	0.10953	0.03362	-1.037
Cloy refr[act]ories	0.03851	0.03122	-1.037
Structural clay products. nee	0.12100	0.02115	-1.037
Concrete block and brick	0.01389	0.01197	-0.667
Concrete products, net	0.00530	0.01155	-0.667
Ready-mix concrete	0.00143	0.02279	-0.667
Gypsum producsts	0.05519	0.02471	-0.667
Primary iron and 011111 manufacturing			
Blast furnaces and steel mils	0.02149	0.01413	-2.235
Eleotrometallurgioal products	0.02103	0.00379	-2.235
iron and steel forging'	0.01108	0.00424	-2.657
Prksery nonferrous metals manufactsring			
Primary copper	0.01352	0.00713	-0.727
Prtnery aluminum	0.02532	0.00521	-0.627
Alumkaan roiling and dravAng	0.01182	0.00647	-0.627

Source: U.S. Department of Commerce. *The Detailed Input-Output Structure of the U.S. Economy,* 1977, (Washington, D.C.: USGPO. 1984) and Shish et al.

pricing policies, and depends upon the import demand and export supply elasticities? Given the estimated change in the import price of a commodity, the change in the value of imports to the United States is measured along the U.S. import demand curve. This change in the value of imports is derived from the definition of the import demand elasticity.[3]

Import demand elasticities used here are estimated for three-digit SIC industries for all imports into the United States! These elasticities are also presented in Table 7-1. Estimates of export supply elasticities are very difficult to obtain.[6] Hence, two values of the export supply elasticity are used to give a range of effects. An infinite export supply elasticity is used for the high estimate. Under this assumption, the full cost

Specifically, this proportion can be estimated using the equation:

$$AP/DC = e / (es + es) d \qquad (3)$$

where AP is the change in the export price and AC is the change in unit cost, resulting from pricing policies, and e_s is the export supply elasticity and I'd Is the import demand elasticity.

Specifically, the change in the value of imports can be estimated using the equation:

$$AM = M\ (AP/P)e\ \ d \qquad (4)$$

'-Continued

where M and P are the total value of imports from a country and the current price, respectively, AM and AP are the change in the value of imports and the change in price arising from the cost advantages employed by an industry due to government pricing policies, and e d is the import demand elasticity.

• Clinton Shiells, Robert Stern, and Alan Deardorff, "Estimates of the Elasticities of Substitution between Imports and Home Goods for the United States," *Weltwirtschaftliches Archly* vol. 122(3), pp. 497 _519.

• John Suomela and Don Rousslang, "Calculating the Consumer and Net Welfare Costs of Import Relief," USITC Staff Research Study #15, Office of Economics, 1985, pp. 9-10.

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advantage to foreign producers resulting from government pricing policies is passed on to U.S. . consumers in the form of lower export prices. An export supply elasticity of one is assumed for the low estimate. Under this assumption, savings are passed on the U.S. consumers at a rate dependent upon their import demand elasticity and is always less than the full-cost advantage enjoyed by foreign producers due to government pricing policies.

One final assumption concerns the prices of natural gas and fuel oil in the United States in 1988. Although the price of natural gas fluctuates throughout the year, an average price of $3.00 per thousand cubic feet" is used in the estimates. Similarly, a price of $14.78 per barrel' of fuel oil is used in the estimations.

● Compiled from the Official Statistics of the U.S. Department of Commerce.
of Energy, *Monthly Energy Review,* October 1988.

Empirical Results

Mexico

Estimates of the price of natural gas and the price of fuel oil in Mexico are $2.46 per thousand cubic feet and $7.56 per barrel, respectively.' Using the price estimates for. the United States, Mexican producers enjoy an 18 percent price advantage for natural gas and a 49 percent price advantage for fuel oil over U.S. producers. Hence, a cost advantage for Mexican producers can be calculated using the input coefficients with this estimated price advantage. This cost advantage is reported in table 7-2. Production costs in Mexico are estimated to be 0.38 percent to 19.25 percent lower due to the savings realized through lower natural resource costs. In particular, the carbon black industry has a

● This *information* was obtained from the "Submission of the American Cement Trade Alliance in Response to Request for Comments." p. 5.

Table 7-2
Cost advantage of Mexican producers In energy-Intensive industries due to government pricing policies for natural gas and refined petroleum

Industry	*Natural gas*	*Refined petro-leum*	*Total*
		Percent	
Chemicals and selected °hernias! products			
. Industrial inorganic and organic chemicals	0.56	1.02	1.58
Nitrogenous and phowlwft terbium	1.05	0.69	1.74
Agricultural chemicals. nee	0.25	0.48	0.73
Carbon black	1.32	17.93	19.25
Plastics and synthede materials			
Plastic materials	0.21	1.04	1.24
Synthetic rubber and reeks	0.25	0.21	0.47
Cellulosic man-made fibers	0.44	1.03	1.46
Organic fibers, nonoMulosic refMnq and related industries	0.06	0.82	0.88
Petroleum	0.29	3.20	3.49
Rubber and miscellaneous plastics products			
Miscellaneous plastics products	0.06	0.33	0.38
Glass and glass products			
Glass and glass products except containers	0.61	0.56	1.17
Glass oontainers	0.68	0.96	1.84
Stone and clay products			
Cement. hydraulic	0.83	1.43	2.26
Brick and structural clay tle	1.97	1.64	3.61
Clay refractories	0.69	1.53	2.22
Structural clay products. nee	2.18	1.03	3.21
Concrete block and brick	0.25	0.58	0.83
Concrete products. nets	0.10	0.68	0.66
Ready-mbc concrete	0.03	1.11	1.14
Gypsum products	0.99	1.21	2.20
Primary Iron and steel manufacturing			
Blast furnaces and steel mlis	0.39	0.69	1.08
Electrometallurgicsal products	0.38	0.19	0.68
iron and steel forgMgs	0.20	0.21	0.41
Primary nonferrous metals manufacturing			
Prknwy copper	0.24	0.35	0.59
Primary aluminum	0.46	0.25	0.71
Aluminum rolling and Thing	0.21	0.32	0.53

Source: Estimated by staff of the U.S. International Trade Conwnission.

large-cost advantage due to the large amount of natural resource input required per dollar of output. Other industry groups that are also notable include petroleum refining and stone and clay products.

Using the amount of imports into the United States from these industries and the import demand and export supply elasticities, it is possible to estimate the reduction in import prices and a plausible increase in the value of imports into the United States due to Mexico's pricing policy. Table 7-3 presents the value of imports from Mexico into the United States, and table 7-4 reports estimates for the change in import prices and resulting change in the value of imports. Recall that the high estimate stems from an infinite export supply elasticity and the low estimate results from an export supply elasticity of one. Focusing on those industries that have over 10 percent of their imports from Mexico, one can see that the carbon black, the glass and glass products, and the cement industries are impacted most substantially. Based on the low estimate in table 7-4, it appears that actual U.S. imports of carbon black are $982,000 higher than they would have been without lower input prices. However, notice that the high estimate for the change in the value of imports for carbon black is double the actual amount of imports. Clearly this estimate is too high, suggesting that the export supply elasticity is not perfectly elastic.

Saudi Arabia

As indicated earlier, the Saudi Government has traditionally provided natural resource inputs at cost for domestic producers. This results in domestic prices well below world prices. It is estimated that natural gas is available at $0.50 per thousand cubic feet and fuel oil is available at $4.20 per barrel" Hence, Saudi producers benefit from an 83 percent price advantage for natural gas and a 72 percent price advantage for

• U.S. Dermisat of State, New Trade Act Report,* Incoming Telegram, Jan. 22, 1989, Saudi Arabia.

Table 7-3
Imports into the United States from Mexico in energy-Intensive industries, 1988 .

Industry	*Imports*	*Percent of total imports*
	1.000 dollars	
Chemicals and selected chemical products		
Industrial Inorganic and organic chemicals	429,971	3.55
[illegible]	36,081	4.89
Agricultural chernicals, nee	2.725	2.34
Carbon black	5,580	11.69
Plastics *and* synthetic materials		
Plastic materials and ream	56.710	4.90
Synthetic rubber	30,411	6.60
Cellulosic man-made fibers	2,352	4.73
Organic fibers, noncsilulosic	27,059	6.40
Petroleum and related industries	195.847	1.89
[illegible]		
Miscellaneous plastics products	205.639	4.46
Glass and glass products		
Glass and glass products except containers	162,437	10.61
Glass containers	37.141	23.97
Stone and clay products		
Cement, hydraulic	124.527	24.15
Brick and structural clay tNe	1,445	20.69
Clay refractories	536	4.24
Structural clay products. nec	2,909	23.78
Concrete block and brick	350	18.73
Concrete products. nec	3,013	5.71
Ready-mix concrete	50	0.84
Gypsum products	2.467	3.11
Printery iron and steel manufacturing		
Blast furnaces and steel mai	231.026	2.26
ElectrometallurgIcal products	37.719	3.82
Iron and steel forgings	6.812	3.04
Primarynonferrous metals manufachring		
Primary copper	14,340	1.37
Primary alumkaan	15.538	0.71
PJurninum rolling and drawing	17,180	1.53

Source: Compiled from official statistics of the U.S. Bureau of Census.

Table 7-4

Estimated changes In prices and value of Imports In energy-Intensive industries due to Mexican Government pricing policies

Industry	High estimate		Low estimate		Average of high and low estimates as a share of actual Imports
	Change in price	Change in value of Imports	Change in price	Change in value of imports	
	Percent	1,000 dollars	Percent	1,000 dollars	Percent
Chemicals and selected chemical products:					
Industrial Inorganic and organic chemicals	1.58	59,305	0.16	6,105	7.6
Nitrogenous and phosphatic fertilizers	1.74	576	0.91	300	1.2
AgrkwItural chemicals,	0.73	18	0.38	10	0.5
Carbon black	19.25	11,470	1.65	982	111.6
Plastics and synthetic materials:					
Plastic materials and resins	1.24	3,584	0.20	589	3.7
Synthetic rubber	0.47	723	0.08	119	1.4
Cellulosic man-made fibers	1.46	175	0.24	29	4.3
Organic fibers, noncelulosic	0.88	1,209	0.14	199	2.6
Petroleum refining and related Industries:					
Petroleum refining	3.49	5.428	1.95	3,026	2.2
Rubber and miscellaneous plastics products:					
Miscellaneous plastics products	0.38	6,330	0.04	701	1.7
Glass and glass products:					
Glass and glass products except containers	1.17	6.709	0.26	1,477	2.5
Glass containers	1.84	1,839	0.50	498	3.2
Stone and clay products:					
Cement, hydraulic	2.26	6,040	0.72	1.921	3.2
Brick and structural clay de	3.61	54	1.77	27	2.8
Clay refractories	2.22	12	1.09	6	1.7
Structural clay products, nee	3.21	97	1.58	48	2.5
Concrete block and brick	0.83	2	0.50		0.4
Concrete products, nee	0.66	13	0.40		0.4
Gypsum products	2.20	38	1.32	22	1.2
Primary iron and steel manufacturing:					
Blast furnaces and steel mills	1.08	5,561	0.33	1,719	1.6
Electrometailurgical products	0.56	475	0.17	147	0.8
Iron and steel forging.	0.41	74	0.11	20	0.6
Primary nonferrous metals manufacturing:					
Primary copper	0.59	82	0.34	36	0.3
Primary aluminum	0.71	80	0.41	46	0.4
Aluminum rolling and drawing	0.53	57	0.33	35	0.3

Source: Estimated by staff of the U.S. International Trade Commission.

fuel oil. A cost advantage for Saudi producers is calculated and reported in table 7-5. Estimations are only made for those industries that have imports into the United States. Production costs are estimated to be between 0.74 percent and 6.03 percent lower due to lower input prices for natural gas and fuel oil. Industries where Saudi producers have a notable cost advantage include chemical products, petroleum refining products, and cement.

Table 7-6 presents the level of imports into the United States from these industries and table 7-7 presents the estimated price change and increase in the value of imports due to Saudi pricing policies. Of the industries mentioned above, industrial inorganic and organic chemicals and petroleum refining are the two most impacted from the Saudi policies. However, due to the small amount exported, the effect in the U.S. market is likely to be negligible.

Venezuela

it is estimated that the state-owned firm of Petroleos de Venezuela provides to domestic producers natural gas at $0.17 per thotR,rd cubic

Table 7-8
Cost advantage of Saudi Arabian producers In energy-Intensive Industries due to government pricing policies for natural gas and refined petroleum

Industry	Natural gas	Refined petro-leum	Total
	Percent		
Chemicals and selected chemical products:			
industrial inorganic and organic chemicals	2.61	1.49	4.11
Nitrogenous and phosphatic fertlizers	4.85	1.02	5.86
Plastics and synthetic materials:			
Plastic materials and resins	0.96	1.52	2.48
Petroleum and related industries:			
Petroleum	1.34	4.69	6.03
Rubber and miscellaneous plastics products:			
Miscellaneous plastics products	0.27	0.48	0.74
Stone and clay products:			
Cement, hydraulic	3.84	2.10	5.94
Primary iron and steel manufacturing:			
Blast furnaces and steel mils	1.79	1.01	2.80
Electrometallurgical products	1.75	0.27	2.02
Priniary nonferrous metals manufacturing:			
Primary aluminum	2.11	0.37	2.48

Source: Estimated by staff of the U.S. International Trade Commission.

Table 7-8
imports Into the United States from Saudi Arabia In energy-Intensive industries, 1988

Industry	imports	Percent of total imports
	1.000 dollars	
Chemicals and selected chemical products:		
industrial inorganic and organic chemicals	137,853	1.14
Nitrogenous and phosphatic fertilizers	4,181	0.57
Plastics and synthetic materials:		
Plastic materials and resins	76	.01
Petroleum refinkg and related industries:		
Petroleum nflrnirng	510,254	4.93
Rubber and miscellaneous plastics products:		
Miscellaneous plastics products	52	0
Stone and clay products:		
Cement, hydraulic	613	0.12
Primary iron and steel manufacturing:		
Blast furnaces and steel mils	10,477	0.10
Electrometalurgical products	35	0
knary nonferrous metals manufacturing:		
PrPrimary aluminum	1,793	0.08

Source: Complied from official statistics of the U.S. Bureau of Census.

feet and fuel oil at $1.34 per barre1. [10] Thus, Venezuelan producers enjoy a 94-percent price advantage for natural gas and a 91-percent price advantage for fuel oil. The cost advantage for Venezuelan producers is reported in table 7-8 for those industries that export to the United States. In Venezuela, the cost advantage ranges from 0.91 percent to 13.49 percent with the chemicals, the petroleum refining, and the stone and clay products industries having the largest benefit due to low natural resource pricing.

Table 7-9 presents the level of imports into the United States from Venezuela and table 7-10 presents the estimated price decrease and a plausible increase in the value of imports due to the cost advantage realized in these industries. The petroleum-refining industry is likely to be impacted the most from exports from Venezuela since over 20 percent of the United States' imports are from Venezuelan producers. If&

[10] U.S. Department of State Telegram, "Industrial Outlook for Petroleum and Natural Gas, Venezuela, 1987," July 19, 1988, Venezuela.

Table 7-7

Estimated changes in prices and value of imports In energy-intensive industries due to Saudi Arabian Government pricing policies

Industry	High estimate		Low estimate		Average of high and low estimates as a share of actual imports
	Change in price	Change In value of imports	Change in price	Change in value of imports	
	Percent	1.000 dollars	Percent	1.000 dollars	Percent
Chemicals and selected chemical products:					
industrial inorganic and orggnic chemicals	4.11	49.311	0.42	5,076	19.7
Nitrogenous and phosphatic fertilizers	5.86	225	3.06	117	4.1
Plastics and synthetic materials:					
Plastic materials and resins	2.48	10	0.41	2	7.9
Petroleum refining and related kidustries:					
Petroleum refining	6.03	24.445	3.36	13.626	3.7
Rubber and miscellaneous plastics products:					
Miscellaneous plastics products	0.74	3	0.08	0	2.9
Stone and clay products:					
Cement, hydraulic	5.94	78	1.89	25	8.4
Primary Won and steel manufacturing:					
Blast furnaces and steel mills	2.80	656	0.87	203	4.1
Electrometallurgical products	2.02	2	0.63	0	2.9
Primary nonferrous metals manufacturing:					
Primary akaninurn	2.48	32	1.44	19	1.4

Source: Estimated by staff of the U.S. International Trade Commission.

Table 7-8

Cost advantage of Venezuelan producers In enorgy-intanshis industries due to government pricing policies for natural gas and refined petroleum

Industry	Natural gas	Refined petro-Mum	Total •
	Percent		
Chemicals and selected chemical products:			
Industrial inorganic and organic chemicals	2.96	1.90	4.85
Nitrogenous and phosphaVic fertlizers	5.49	1.29	6.78
Plastics and synthetic materials:			
Plastic materials and resins	1.09	1.93	3.01
Petroleum refining and related Industries:			
Petroleum refining	1.52	5.96	7.48
Rubber and miscellaneous plastics products:			
Miscellaneous plastics product	0.30	0.61	0.91
Glass and glass products:			
Glass and glass products except containers	3.19	1.04	4.23
Glass containers	4.64	1.78	6.42
Stone and clay products:			
Cement, hydraulic	4.35	2.66	7.01
Brick and structural clay tie	10.33	3.06	13.39
Structural clay products. nee	11.41	1.92	13.34
Concrete products. now	0.50	1.05	1.55
Primary iron and steel manufacturing:			
Blast furnaces and steel mils	2.03	1.28	3.31
Electrometallurgical products	1.98	0.34	2.33
iron and steel forging.	1.05	0.39	1.43
Primary nonferrous metals manufacturing:			
Primary copper	1.28	0.65	1.92
Primary aluminum	2.39	0.47	2.86
Aluminum rolling and drawing	1.12	0.59	1.70

Source: Estimated by staff of the U.S. International Trade Commission.

Table 7-9
imports Into the United States from Venezuela In energy-Intensity industries. 1988

Industry	*Imports*	*Percent of total Imports*
	1,000 dollars	
Chemicals and selected chemical products:		
Industrial inorganic and organic chemicals	111,657	0.92
[redacted]	17,467	2.37
Plastics and synthetic materials:		
Plastic materials and resins	457	0.04
Petroleum and related industries:		
Petroleum	2,164,566	20.92
[redacted]		
Miscellaneous plastics products	5,535	0.12
Glass and glass products:		
Glass and glass products except containers	98	0.01
Glass containers	771	0.50
Stone and clay products:		
Cement. hydraulic	16,530	3.21
Brick and structural clay tie	1,187	17.00
Structural clay products. nee	1,094	8.94
Concrete products, nec	2,099	3.98
Primary iron and steel manufacturing :		
Blast furnaces and steel mills	53,339	0.52
Elsotrometahrgical products	25,639	2.70
Iron and steel forging.	372	0.17
Primarynonferrous metals manufacturing:		
Primary copper	82	0.01
Primary aluminum	106,448	4.84
Aluminum rolling and drawing	81.499	7.24

Source: Compiled from Official statistics of the U.S. Bureau of Census.

Table 7-10

Estimated changes In prices and value of Imports In energy-intensive Industries due to Venezuelan Government pricing policies

industry	High estimate		Low estimate		Average of high and low estimates as a share of actual Imports
	Change in Price	Change in value of imports	Change In price	Change In value of imports	
	Percent	1,000 dollars	Percent	1,000 dollars	Percent
Chemicids and selected chemical products:					
industrial inorganic and organic chemicals	4.85	47.222	0.50	4,881	23.3
Nitrogenous and phosphatic fertilizers	6.78	1,086	3.54	566	4.7
Plastics and synthetic materials:					
Plastic materials and reskis	3.01	70	0.50	12	9.2
Petroleum refining and related industries:					
Petroleum refining	7.48	128,533	4.17	71,646	4.6
Rubber and miscellaneous plastics products:					
MIscelaneous plastics products	0.91	404	0.10	45	4.1
Glass and glass products:					
Glass and glass products except containers	4.23	15	0.93	3	9.2
Glass containers	6.42	133	1.74	36	10.9
Stone and clay products:					
Cement, hydraulic	7.01	2,487	2.23	791	9.9
Brick and structural clay de	13.39	165	6.57	$1	10.4
Structural clay products, moo	13.34	151	6.55	74	10.3
Concrete products, nec	1.55	22	0.93	13	0.8
Primary iron and steel manufacturing:					
Blast furnaces and steel	3.31	3,948	1.02	1.221	4.9
Electromstalkrglcal products	2.33	1,386	0.72	429	3.4
Iron and steel forging*	1.43	14	0.39	4	2.4
Primary nonferrous metals manufacturing:					
Primary copper	1.92	1	1.11	1	1.2
Primary aluminum	2.86	2.215	1.66	1.283	1.6
Aluminum rolling and drawing	1.70	870	1.05	535	0.9

Source: Estimated by staff of the U.S. international Trade Commission.

other industries exports are too small to likely have a significant impact in the U.S. market.

Indonesia

It is estimated that Indonesian producers are able to buy natural gas at $1.50 per thousand cubic feet but that fuel oil is available roughly at the same level as that to U.S. producers. [11] Thus, Indonesian producers have a 50-percent price advantage for natural gas, but no price advantage for fuel oil. Table 7-11 reports the cost advantage due to the Indonesian Government's pricing policy for natural gas in the industries that export to the United States. Indonesian producers have a small cost advantage in these industries ranging from 0.16 percent to 1.69 percent. Table 7-12 reports the value of imports and table 7-13 reports the impact of the pricing policy. As is evident from the data, a small percentage of U.S. imports come from Indonesia, and, consequently, the effect of the pricihg policy for natural gas is likely to be negligible.

" U.S. Department of State, "The Petroleum Report, Indonesia," July 1987, Jakarta, Indonesia.

Table 7-11

Cost advantage of Indonesian producers In energy-intensive Industries due to government pricing policies for natural gas and refined petroleum

Industry	Natural gas	Refined petro-leum	Total
		Percent	
Chemicals and selected chemical products: industrial inorganic and organic chemicals	1.57	0.00	1.57
Plastics and=tic materials: Synthetic	0.71	0.00	0.71
Petroleum rsfknq and related industries: Petroleum fkikq	0.81	0.00	0.81
Rubber and miscellaneous plastics products: Miscellaneous plastics products	0.16	0.00	0.16
Glass and glass products: Glass and glass products except containers	1.69	0.00	1.69
Primary iron and steel manufacturing: Blast furnaces and steel mills	1.07	0.00	1.07
Primary nonferrous metals manufacturing: Primary aluminum	1.27	0.00	1.27

Source: Estimated by staff of the U.S. International Trade Commission.

Table 7-12

Imports Into the United States from Indonesian energy-Intenshre industries. 1988

Industry	imports	Percent of total imports
	1.000 dollars	
Chemicals and selected chemical products: industrial inorganic and organic chemicals	144.577	1.19
Plastics and=tic materials: Synthetic	135	0.03
Patrolman and related industries: Petroleum re	125.407	1.21
Rubber and miscelansous plastics products: Miscellaneous plastics products	1.015	0.02
Glass and glass products: Glass and glass products except containers	1,093	0.07
Primary iron and steel manufacturing: Blast furname and steel MI.	74,805	0.73
Primary nonferrous metals manufacturing: Primary aluminum	651	0.03

Source: Compiled from Official statistics of the U.S. Bureau of Census.

Table 7-13

Estimated changes In prices and value of imports In energy-Intensive Industries due to Indonesian Government pricing policies

Industry	High estimate		Low estimate		Average of high and low estimates as a share of actual imports
	Change In price	Change In value of imports	Change In price	Change In voiuo of imports	
	Percent	1,000 dollars	Percent	1,000 dollars	Percent
Chemicals and selected chemical products: industrial inorganic and organic chemicals	1.57	19,748	0.16	2,033	7.5
Plastics and synthetic materials: Synthetic rubber	0.71	5	0.12	1	2.2
Petroleum refining and related Industries: Petroleum refilling	0.81	803	0.45	448	0.5
Rubber and miscellaneous plastics products: Miscellaneous plastics products	0.16	13	0.02	1	0.7
Glass and glass products: Glass and glass products except containers	1.69	65	0.37	14	3.6
Primary iron and Steel manufacturin g: Blast furnaces and steel mile	1.07	1,796	0.33	555	1.6
Primary nonferrous metals manufacturing: Primary aluminum	1.27	6	0.73	3	0.7

Source: Estimated by staff of the U.S. International Trade Commission.

APPENDIX A
LETTER OF REQUEST FROM USTR AND THE RESPONSE OF THE COMMISSION

THE UNITED STATES TRADE REPRESENTATIVE
Executive Office of the President
Washington. D.C. 20508

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NOV 4 las

The Honorable Anne Brunsdale
Acting Chairman
U.S. International Trade Commission
500 E Street, S.W.
Washington, D.C. 20436

Dear Chairman Brunsdale:

At the direction of the President, I hereby request that the U.S. International Trade Commission conduct an investigation pursuant to section 332 of the Tariff Act of 1930 in order to identify countries which maintain investment barriers or other restrictions which effectively prevent foreign capital from claiming the benefit of government programs on the same terms as domestic capital.

The Commission should submit its report on this investigation to the House Committee on Ways and Means, the Senate Committee on Finance, and the U.S. Trade Representative within nine months of the date of receipt of this letter and at that time make copies of the.report available to the public.

Sincerely,

lac Clayton Yeutter

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ACTING CI 'AIRMAN

UNITED S'INI'ES INTERNATIONALTRADE COMMISSION

WASI IINGIUN. D.C. 204:10

February 2, 1989

Honorable Carla Hills
United States Trade Representative
600 17th Street NW
Washington, DC 20506

Dear Ambassador Hills:

On November 16, 1988, the Commission received a request from then U.S. Trade Representative Clayton Yeutter, to conduct an investigation pursuant to section 332 of the Tariff Act of 1930 in order to identify countries which maintain investment barriers or other restrictions which effectively prevent foreign capital from claiming the benefit of government programs on the same terms as domestic capital. The Commission has instituted an investigation in response to the USTR request and will provide a report by August 16, 1989, as requested. A copy of the Commission's notice of investigation is enclosed.

At the suggestion of the USTR's General Counsel and other USTR staff, the Commission has examined the legislative history leading to the USTR request, and discussed the request with the Ways and Means Committee staff most familiar with the conference report language which directs the USTR to request the ITC study. On the basis of such examination and discussions, the primary focus of the Commission's investigation will be on the (1) natural resource access and pricing practices of a limited number of countries, principally Mexico, (2) investment barriers in such countries which prevent U.S. firms from accessing these resources on the same terms as domestic capital, and (3) the impact of such foreign practices on U.S industry and trade. While the primary focus is on natural resource policies is a limited number of countries, the Commission

will also seek public comment on the existence of other types of preferential government programs and investment barriers throughout the world. These programs and barriers will be catalogued in the report by country, but will not be covered in depth in the body of the report. It would be appreciated if you would advise me as soon as possible if the Commission's proposed study focus does not meet your requirements.

Please continue to call on us whenever we can be of assistance to you.

Sincerely,

Anne Brunsdale

Anne Brunsdale
Acting Chairman

Enclosure

APPENDIX B
PERTINENT SECTIONS OF THE CONFERENCE REPORT TO ME OMINBUS TRADE AND COMPlainVENESS ACT OF 1988

Conference agreement

The House recedes, with an amendment to update the findings.

PART 2—IMPROVEMENT IN THE ENFORCEMENT OF THE ANTIDUMPING AND COUNTERVAILING DUTY LAWS

1. Actionable domestic subsidies (sec. 153 of House bill; sec. 333 of Senate amendment; sec. 1312 of conference agreement)

Present law

Section 771(5)(B) of the Tariff Act of 1930 sets forth a list of actionable domestic subsidies which, if provided or required by government action to a specific enterprise or industry, or group of enterprises or industries, fall within the definition of subsidy subject to U.S. countervailing duties. This list includes, but is not limited to:

(1) the provision of capital, loans, or loan guarantees on terms inconsistent with commercial considerations;

(2) the provision of goods or services at preferential rates;

(3) the grant of funds or forgiveness of debt to cover operating losses sustained by a specific industry; or

(4) the assumption of any costs or expenses of manufacture, production or distribution.

House bill

(a) The House bill clarifies the application of the countervailing duty law to domestic subsidies by requiring that the Commerce Department base its determination on whether a particular subsidy is in fact bestowed upon a specific industry or group of industries, or instead is bestowed upon industries in general.

(b) The House bill also provides a hierarchy of rates to serve as benchmarks for determining whether goods or services are provided at "preferential rates." The provisions requires that the Commerce Department compare the rate provided to the enterprise or industry to the first of the following rates that can be determined: a freely-available and market-determined rate within the foreign country; an appropriate rate applicable to external transactions; the cost of production plus a reasonable profit.

Senate amendment

•(a) The Senate amendment contains a provision similar to that of the House bill, which is effective for investigations and reviews initiated after date of enactment.

(b) No provision.

Conference agreement

The House recedes with an agreement by the conferees to direct the U.S. Trade Representative to ask the U.S. International Trade Commission to conduct a section 332 investigation identifying countries which maintain investment barriers or other restrictions which effectively prevent foreign capital from claiming the benefit of foreign government programs on the same terms as domestic capital. The report should be submitted to the House Ways and Means Committee, the Senate Finance Committee, and the USTR.

Based upon the ITC report, the USTR should self-initiate section 301 investigations to address those practices it considers to be the most egregious unreasonable practices within the meaning of section 301 and to have the most adverse impact on U.S. industries.

2. Calculation of subsidies on certain processed agricultural products (sec. 338 of Senate amendment; sec. 1313 of conference agreement)

Present law

In cases involving processed agricultural products, the Commerce Department treats subsidies to growers or producers of the raw agricultural input as being bestowed on the processed product, under certain circumstances.

House bill

No provision.

Senate amendment

The Senate amendment codifies and clarifies Commerce practice by adding a new provision to the Tariff Act of 1930 relating to certain subsidies on processed agricultural products. The provision requires subsidies provided on a raw agricultural product to be deemed as provided on the production or export of an agricultural product processed from such raw product if:

(1) the demand for the raw product is substantially dependent on the demand for the processed product; and

(2) the processing operation adds only limited value to the raw product.

Conference agreement

The House recedes.

3. Revocation of status as a Country under the Agreement (sec. 334 of Senate amendment; sec. 1314 of conference agreement)

***Present* law**

No provision.

House bill

No provision.

Senate amendment

The Senate amendment clarifies that the U.S. Trade Representative has authority to revoke the injury test for any country that violates a Subsidies Code commitment it has undertaken with respect to the United States. The provision explicitly states that the U.S. Trade Representative may revoke the injury test if a foreign country either announces that it will not, or in fact does not, honor its obligations.

Conference agreement

The House recedes.

APPENDIX C
NOTICE OF INVESTIGATION

terminate Bosch as a respondent (if and when the Commission granted Bosch's motion for leave to intervene as a respondent).

Although Makita's petition for review was withdrawn. the Commission could have reviewed the ID on its own motion. If the facts and circumstances so warranted. *See* interim rules 210.55 and 210.54(a)(1)(ii). 53 FR 33043 and 33071 (Aug. 29.1988). After considering the ID, however, the Commission found no basis for taking such action. By virtue of the Commission's determinatioh not to review the ID, It has become the Commission's final determination on Bosch's motion to intervene. *See* interim rules 210.53(h) and 210.55,53 FR 33043. 33070, and 44071 (Aug. 29.1988). and 19 CFR 201.1404.

Correction of the ID. Although the Commission found no error or policy reason warranting review. the Commission determined to make one minor correction in the text of the ID. The word "supplier," which appears in the following portions of the ID. is hereby changed to "manufacturer": page Mast line of the second paragraph: and page 2. sixth line of the third paragraph. This correction was made in order to have the ID conform to the information provided in Bosch's motion to intervene.

Public inspection. Copies of the original and amended motions to intervene and the responses thereto, the ID, the petition for review of the ID the responses thereto. Makita's notice of withdrawal, and all other nonconfidential documents on the record of the investigation are available for public inspection during official business hours (8:45 a.m. to 5:15 p.m.) in the Office of the Secretary. Docket Section. U.S. International Trade Commission. 500 E Street SW.. Room 112. Washington. DC 20430. telephone 202_252_1802. I tearing-impaired individuals are advised that information on this matter can be obtained by contacting the Commission TDD terminal on 202-252-1810.

By Order of the Commission.

Kenneth R. Mason,

Secretory.

Issued: January 31. 1989.

IFR Doc. 89-3019 Filed 2-7-99: 8:45 am)

MILLING Coot 7020-03-IPI

1332-2681

Foreign Investment Barriers or Other Restrictions That Prevent Foreign Capital From Claiming the Benefits of Foreign Government Programs

AGENCY: United States International Trade Commission.

Acnore Institution of investigation and scheduling of hearing.

SUMMARY: Following receipt on November 18,1988, of a request from the U.S. Trade Representative made at the direction of the President. the Commission Instituted Investigation No. 332_208 under section 332(g) of the Tariff Act of 1930 (19 U.S.C. 1332(g)) in order to identify countries which maintain investment barriers or other restrictions which effectively prevent foreign capital from claiming the benefit of government programs on the same terms as domestic capital.

EFFECTIVE DATE: January 27, 1989.

FOR FURTHER INFORMATION CONTACT: Ms. Cynthia B. Foreso (202-252-1348) or Mr. Edward Matusik (202-252-1358) in the Commission's Office of Industries. For information on legal aspects of the investigation contact Mr. William Gearhart of the Commission's Office of the General Counsel at 202-252-1091.

Background: The conference report accompanying the Omnibus Trade and Competitiveness Act of 1988 (Report No. 100-578. at p. 587) directs the U.S. Trade Representative to ask the U.S. International Trade Commission to conduct a section 332 investigation identifying countries which maintain investment barriers or other restrictions which effectively prevent foreign capital from claiming the benefit of foreign government programs on the same terms as domestic capital. The conference report further directs that the Commission's report should be submitted to the House Ways and Means Committee. the Senate Finance Committee. and the USTR. Based upon the ITC report. the conference report indicates the USTR should self-initiate section 301 investigations to address those practices it considers to be the most egregious unreasonable practices within the meaning of section 301 and to have the most adverse impact on U.S. industries.

Written Submissions: Interested persons are invited to submit written statements concerning the Investigation. The Commission is seeking early comments from the public on (1) foreign government programs which create an advantage for domestic industries. (2) investment barriers or other restrictions that have the effect of denying these advantages to U.S. persons. and (3) the impact of such foreign practices on U.S. industry and trade. The Commission is seeking information on programs and investment barriers of all types. including those related to natural resource access and pricing. Early submission of written statements is desired. preferably by 5:00 p.m. on February 28.1989, however written statements will be received up to the close of business on April 4,1989. Early comment on areas of public concern will be used to the extent feasible to assist the Commission in focusing its investigation. Commercial or financini information which a submitter desires the Commission to treat as confidential must be submitted on separate sheets of paper, each clearly marked "Confidential Business Information" at the top. All submissions requesting confidential treatment must conform with the requirements of 201.8 of the Commission's *Rules of Practice and Procedure* (19 CFR 201.8). All written submissions, except for confidential business information, will be made available for inspection by interested persons. All submissions should be addressed to the Secretary. United Slates international Trade Commission. 500 E Street. SW.. Washington, DC 20436.

Public Hearing: A public hearing in connection with the investigation will be held in the Commission Hearing Room. 500 E Street SW., Washington. DC. beginning at 9:30 a.m. on April 19. 1909. and continuing as required on April 19. All persons shall have the right to appear by counsel or in person, to present information. and to be heard. Persons wishing to appear at the public hearing should file requests to appear and should file preheating briefs (original and 14 copies) with the Secretary at the Commission's office in Washington. DC. not later than 5:00 p.m.. April 4, 1989. Post_hearing briefs are due May 2.1989.

!tearing-impaired individuals are advised that information on this matter can be obtained by contacting our TDD terminal on (202) 252-1810.

Ily order of the Commission.

Kenneth R. Mason.

Secretory.

Issued: February 2. 1909.

IFR Dec. 89-3010 Filed 2-7-89: 8:45 am)

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I investigation No. 337_2A_2811

Certain Recombinant Erythropoletin; Decision to Extend Deadline for Determining Whether to Review Initial Determination

AGENCY: U.S. International Trade Commission.

ACTION: *Notice.*

SUMMARY: Notice is hereby given the U.S. International Trade

APPENDIX D

OTHER NATIONS' INVESTMENT POLICIES

Other Nations' Investment Policies

Section 2202 of the Omnibus Trade and Competitiveness Act of 1988 required the U.S. Department of State to prepare a detailed report regarding the economic policy and trade practices of each country with which the United States has an economic or trade relationship. The report is to be transmitted no later than January 31 of each year to the Committee on Foreign Relations and the Committee on Ways and Means of the U.S. House of Representative and the Committee on Finance of the U.S. Senate. Among the topics to be discussed in this report are any acts, policies, and practices that constitute significant barriers to U.S. exports or direct foreign investment in that country by U.S. persons.

Certain countries were selected from the State Department report[1] and a report on foreign trade barriers prepared by the U.S. Trade Representative[2] and summarized in this appendix. The countries selected possess the natural resources necessary for the maintenance or development of the energy-intensive industries discussed in this report.

Argentina

In general Argentine laws on foreign investment are liberal. However, several sectors are restricted. Government approval is required for foreign investment in the areas of national interests such as defense, utilities, media, energy, education, finance, steel, petrochemicals, mining, and informatics. Government approval is also required to purchase shares in locally owned Argentine firms or the addition of capital which would change the ownership to a foreign concern.

Another barrier to foreign investment is Argentina's denial of access to certain parts of the insurance market. As a result, any company using government benefits, such as tax forgiveness, release from import duties or government contracts, must insure with an Argentine insurer.

Australia

Generally, all investments in Australia receive national treatment whether foreign or domestically owned. There are few barriers to investment. However, Australian law restricts foreign investment in certain sectors. Approval of the Foreign Investment Review Board (FIRB) is required in these sectors, which are required by law to remain domestically owned. These sectors include media, civil aviation, residential real estate, and mining. The FIRB also oversees takeovers of domestic firms. In fact, all investments over $10 million are subject to review, but are generally approved. In spite of restrictions, U.S. investment in Australia has increased, primarily in petroleum and manufacturing, specifically chemicals.

In the mining sector, foreign investment over $10 million must comprise 50 percent Australian equity. Exceptions can be made especially when Australian capital is not available. However, petroleum and gas development projects are not subject to the 50 percent equity guideline maintained in the mining sector. Uranium mining ventures are now prohibited for both foreign and domestic interests.

The FIRB also administers Australia's Foreign Takeover Act. Acquisition of 15 percent or more of an Australian corporation requires FIRB approval with national interests as the primary deciding factors. However, interests less than $5 million usually do not require FIRB approval in practice.

Brazil

Brazil's exercises a variety of policies that act as barriers to foreign investment. The most visible policies are price controls, remittance controls, and arbitrary investments laws. In spite of these barrier policies, US and foreign investment has increased with some companies having major investment in Brazil, primarily in manufacturing and finance.

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[1] U.S. Department of State, ***Country Reports on Economic Policy and Trade Practices,*** a report submitted to the Committee on Foreign Affairs, Committee on Ways and Means of the U.S. House of Representatives and the Committee on Foreign Relations, Committee on Finance, U.S. Senate, in accordance with section 2202 of the Omnibus Trade and Competitiveness Act of 1988, March 1989.
[2] United States Trade Representative, ***1989 National Trade Estimate Report on Foreign Trade Barriers,*** 1989.

The sectors experiencing the greatest restrictions deterring foreign investment include petroleum and refining, informatics, public utilities, media, real estate and shipping. Although petroleum production and refining are open to foreign investors, policies prohibiting majority participation are in place. For example, production of basic petrochemicals is usually reserved for tripartite ventures that include the government-owned Petroquisa. By law the 51 percent of the company must be government owned. In other sectors foreign investment is limited to joint ventures or capital participation. New foreign investment in the informatics sector is limited to capital. Local producers also receive preferential financing, government procurement, and tax incentives to deter foreign investment. Both mining and health care sectors prohibit majority participation by foreign firms in accordance with Brazil's new constitution. Other limitations mandated by the constitution include barring capital participation in land, river, coastal, maritime and internal air transportation as well as ownership of television, radio and print media.

The most notable price controls are experienced in industrial products, such as auto and pharmaceutical industries. In general, these controls are in place to control inflation. Another barrier to foreign investment is the remittance of profits. Profits in excess of nine percent of capital are taxed at graduated rates. In Brazil, intangible capital is not registered that increases the remittance of profits.

Colombia

Colombia has made steps forward in attempting to remove barriers to foreign investment. Although they have raised the level of capital remittance, liberalized local control requirements, created incentives for foreign investment and streamlined the bureaucratic requirements in attempts to increase foreign investment, bathers still exist. These bathers include requirements for participation of national investors and employment of nationals, technology transfers and local content. Furthermore, most foreign investment must be authorized.

France

New investments in France no longer require approval; however, investment by non-EC or U.S. firms must obtain approval of the French Foreign Ministry to acquire French companies over FF 10 million in assets. Typically the ministry will not reject the proposal, but will delay the approval until a domestic buyer appears or until a potential investor makes commitments in suggested areas such as employment levels or sourcing levels. Another deterrent to foreign investment includes the appropriation of certain investment incentives and preferential credits that depend upon the amount of domestic equity. France also restricts foreign investment in certain sectors, including agriculture, aviation, and energy.

India

The Indian Government practices policies that severely restrict foreign investment. Foreign investment is limited to 30 officially designated industries. The other sectors are prohibited except for export-only industries. The Government screens all potential investors by the Foreign Investment Board (FIB). Local financing is not available to foreign firms. Furthermore investors cannot hold more than 40 percent equity. However, majority equity is allowed when desired technology is involved. India also enforces local content commitments and export performance as conditions for approving foreign investment.

Japan

Japan has few formal legal barriers to foreign investment. Limitations on foreign equity that exist are in the areas of agriculture, arms, gunpowder, aircraft, atomic energy, narcotics and vaccines manufacturing, fishing and forestry, oil and gas, mining, telecommunications, and leather product manufacturing. Tobacco manufacturing is prohibited. Foreign investment in banking and securities industries is subject to reciprocity requirements. However, foreign investment is small primarily as a result of the Japanese market's characteristics such as government and industry ties, reluctance to break long-term employee and supplier agreements, and cross-shareholding among allied companies. Furthermore, Japanese owners are reluctant to sell corporations to majority stockholders.

Korea

Investment in Korea is dependent upon approval by the Government. In 1988, 79 percent of the market was available for foreign investment. Foreign investment in excess of $3 million or 50-percent equity requires the approval of the Ministry of Finance, which upon approval defers the final decision to the ministries directly related to the investment. These ministries hold a series of negotiations with competing Korean industry to air their concerns. Generally trade-related investment measures serve as informal conditions of approval. Korea also introduced a "going public" policy that instructs local and foreign firms to sell at least 30 percent of their shares.

Although these practices inhibit free investment, many foreign firms have been willing to endure the requirements and invest. U.S. companies now play a major role in many sectors, primarily banking, finance, and electronics.

New Zealand

In general, New Zealand is open to foreign investment. All investment is subject to New Zealand's Overseas Investment Commission (OIC) approval. OIC practices are not considered a barrier to investment. Certain sectors are subject to restrictions. Mining of mineral deposits and natural gas and petroleum reserves are subject to special government-approved arrangements. Deep sea fishing and broadcast media are also restricted to 29- and 10-percent foreign ownership, respectively.

Pakistan

Foreign investment in Pakistan is subject to bureaucratic delays. Up to 24 institutions are required to issue no-objection certificates. During the process many factors are negotiated such as local content and financing requirements which serve as barriers to investment.

Philippines

The Philippines maintains a number of pracdces that deter foreign investment, including lack of national treatment for foreign corporations, equity participation limitations, export performance and involuntary divestment requirements, some forced phase-outs of foreign managerial personnel and prohibitions on land ownership.

United Kingdom

U.S. direct investment in the United Kingdom is significant as a result of its liberal investment policies. The major areas of investment are in petroleum and nonbanking finance, insurance, and real estate. In 1987, U.S. investment increased by $9 billion to $44.7 billion. The United Kingdom offers incentives in the form of capital allowances to firms willing to invest in the country.

In spite of having liberal investment policies, restrictions are in place. The most restrictive sectors include cinema films, aerospace, broadcasting, maritime, and shipping.

The United Kingdom has also limited investment in the petroleum sector by providing preferential treatment to British firms. These firms receive offshore petroleum field supplies and equipment services through the Offshore Supplies Office, which was set up to allow British firms to compete with foreign firms on North Sea contracts. The Government has recently made policies more discriminatory by encouraging petroleum companies to award contracts involving new technology to majority-owned domestic firms to establish the new technology in the United Kingdom.