REPORT BY THE U.S.

General Accounting Office

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Information On The U.S. Importation Of Liquefied Natural Gas

Senator Max Baucus and Congressman Donald Pease were concerned with several issues regarding the United States' use of imported liquefied natural gas. This report responds to questions on

--liquefied natural gas sources and consumption,

--price of imported liquefied natural gas compared to Mexican and Alaskan sources,

--ownership interests of liquefied natural gas tankers, and

--liquefied natural gas use by utility companies.

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EMD-79-48
MARCH 22, 1979

UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

ENERGY AND MINERALS
DIVISION

B-178205

The Honorable Max Baucus
United States Senate
The Honorable Donald J. Pease
House of Representatives

In your December 14, 1978, letter, you asked several questions relating to liquefied natural gas (LNG) imports and requested that we review and report on the U.S. use of imported LNG, considering that Mexico has significant natural gas supplies available for export.

Appendix I presents our detailed answers to your specific questions. As agreed with your office, because of their similarities we combined our answers for questions 4 and 9 and questions 5 and 6 of the request letter.

We updated data in our published LNG reports with respect to the approved long-term LNG import projects and discussed the issues with Department of Energy officials from the Federal Energy Regulatory Commission, Economic Regulatory Administration, and Energy Information Administration.

We plan no further distribution of this report until 30 days from the date of its issuance. At that time, we will send copies to interested parties and make copies available to others upon request.

J. Dexter Peach
Director

GAO RESPONSE TO QUESTIONS RAISED BY SENATOR BAUCUS AND CONGRESSMAN PEASE IN LETTER DATED DECEMBER 14, 1978

1. HAS U.S. CONSUMPTION OF LNG IMPORTS SIGNIFICANTLY INCREASED IN RECENT YEARS?

Consumption of LNG imports by the United States has not increased significantly in recent years and is not expected to do so in the foreseeable future. The United States imported 10.2, 11.9, and 84.5 billion cubic feet (Bcf) of LNG in 1976, 1977, and 1978, respectively. These figures represent only .05, .06, and .43 percent of total natural gas consumption for those respective years. If the three approved LNG projects operate at full capacity in 1980, imports will total 587 Bcf, or about 2.4 percent of total projected 1980 consumption. If the one pending project is approved, then total LNG imports will reach 784 Bcf in 1985, or about 3.1 percent of total projected natural gas consumption. 1/

Although LNG imports only account for a small percentage of natural gas consumed nationwide, the areas served by pipeline companies shipping imported LNG have varying degrees of dependence upon it. There are five pipeline companies shipping LNG from the three projects and their dependence on LNG imports ranges from 8 to 20 percent.

The administration appears to be deemphasizing LNG imports. The Federal Energy Regulatory Commission (FERC) approved three LNG import projects in Janaury, June, and December 1977, respectively. However, in December 1978, the Economic Regulatory Administration (ERA) disapproved two projects because the applicants failed to demonstrate a national or regional need for this LNG in view of the additional domestic supplies anticipated as a result of the passage of the Natural Gas Policy Act of 1978. Also, on March 1, 1979, another project was converted into a

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1/Total natural gas consumption figures for 1980 and 1985 are based on available estimates from the American Gas Association.

peakshaving storage facility for domestic gas. The Pacific Lighting project was approved by ERA but was later suspended due to strong opposition from various interest groups. ERA officials could not tell us if or when the project will be approved.

In his January 23, 1979, testimony before the Joint Economic Committee, the Secretary of Energy stated that longterm LNG import projects rank last in priority as an attractive supplemental source of natural gas and should only be used if other lower cost sources of gas do not materialize. He said if natural gas production from the lower-48 States can maintain current gas use, then reasonably priced supplemental sources should be used to further displace oil imports. These supplemental sources should be utilized on the basis of their relative marginal attractiveness. The Secretary ranked these supplemental sources of gas in the following order: (1) gas transported through the Alaskan Gas Pipeline; (2) Canadian and Mexican gas; (3) domestically produced synthetic gas; and (4) long-term, high-priced imported LNG.

The table on the following page contains information on LNG projects approved or pending as of March 1, 1979.

2. WHAT PERCENTAGE OF OUR LNG SUPPLIES COMES FROM FOREIGN SOURCES AND WHAT PERCENTAGE COMES FROM DOMESTIC SOURCES?

Almost all of our LNG supplies comes from foreign sources. The three approved long-term projects--Distrigas, El Paso, and Trunkline--import or will import all of their LNG from Algeria. One pending project, Pacific Lighting, if approved, would obtain its supply from Indonesia. As pointed out on page 1 of this appendix, LNG imports accounted for only .05, .06, and .43 percent of total natural gas consumption in 1976, 1977, and 1978, respectively. This compares to Canadian and Mexican natural gas imports which represented 5.11 and .01 percent, respectively, of total 1977 consumption. If all three approved projects and the pending one meet their scheduled deliveries, total LNG imports will reach 784 Bcf in 1985, or about 3.1 percent of total projected natural gas consumption.

There is some domestically produced LNG which is used to generate electricity in peak demand periods. However, peakshaving LNG does not represent an increase in total

Status of LNG Import Projects Approved or Pending as of March 1, 1979

Project title	Nation of origin	U.S. terminals	Scheduled delivery	Annual volume Bcf (note a)	Timeframe (years)
Distrigas	Algeria	Everett, Mass.	Operating	43	20
El Paso I Columbia LNG Consolidated System LNG Southern Energy Co.	Algeria	Cove Point, Md. Elba Island, Ga.	Operating	365	25
Trunkline	Algeria	Lake Charles, La.	1980	179	20
Pacific Lighting (pending)	Indonesia	Point Conception, Ca.	1982	197	20
Total				784	

a/ The operating terminals imported 84.5 Bcf in 1978. Project officials anticipate importing the full amounts in the early 1980's.

APPENDIX I

domestic supply since it is produced from already-existing domestic natural gas.

The United States also exports LNG produced in Alaska to Japan. The amounts exported in 1976 and 1977 were 49.8 and 51.7 Bcf, respectively. Department of Energy (DOE) officials expect Alaskan LNG exports to remain constant at about 50 Bcf per year over the next few years.

3. WHAT EFFECT WILL THE ENACTMENT OF THE NATIONAL ENERGY ACT HAVE UPON LNG CONSUMPTION IN THE UNITED STATES?

The natural gas provisions of the National Energy Act are set forth in the Natural Gas Policy Act of 1978. This act does not establish any LNG import policy other than to require that LNG imports be priced on an incremental basis. Under the act's incremental pricing provisions, industrial natural gas users will bear the portion or "increment" of natural gas costs above $1.48 per million British thermal units (Btus) (as of March 1978, adjusted each month for inflation) until the price to these users rises to the Btu equivalent price of substitute fuel oil. These incremental pricing rules could affect LNG demand, assuming lower priced gas supplies are available.

Other provisions of the act which are aimed at increasing domestic production could have an impact on LNG consumption. For example, certain high-cost gas will be deregulated in November 1979, and controls will be lifted on new gas and certain intrastate gas on January 1, 1985. Assuming these actions increase domestic production, there is a lesser likelihood for approval of pending LNG import projects and a lower incentive for planning new projects.

4 & 9. WHAT IS THE RATIONALE BEHIND OUR POLICY OF APPROVING U.S. PURCHASES OF LNG FROM INDONESIA AND ALGERIA AT PRICES EQUAL TO OR SIGNIFICANTLY ABOVE THE PRICE AT WHICH THE MEXICAN GOVERNMENT OFFERED TO SELL THE UNITED STATES NATURAL GAS IN 1977?

As indicated earlier, FERC approved three LNG import projects in 1977 when there was no clear LNG import policy. In our report, "The New National Liquefied Natural Gas Import Policy Requires Further Improvements" (EMD-78-19, Dec. 12, 1977), we stated that the administration's LNG import policy contains unclear, inaccurate, and misleading

statements which add to the confusion over the future role in the United States of imported liquefied natural gas. The policy provided for a case-by-case analysis of each project and stated that LNG imports would not be concentrated in a particular region. Also, the policy provided for siting criteria prohibiting the location of future LNG terminals in densely populated areas.

In approving the three projects, FERC determined that the decisions to import LNG from Algeria were in the public interest with respect to feasibility, timing, price, and environmental concerns. FERC also considered the availability of LNG at a reasonable price without undue risks of dependence on foreign supplies. In making its assessments, FERC considered the reliability of the importing country, the degree of U.S. dependence on LNG imports, the safety conditions associated with the project, and all costs involved.

The estimated delivered price in 1979 dollars for the three approved LNG import projects ranges from $1.78 to $3.15 per million Btus. The price for the pending Pacific Lighting project, if approved, is estimated to be about $2.79 per million Btus in 1979 dollars. It should be noted that these estimates are subject to change due to various escalation clauses in the contracts.

In August 1977 after two LNG projects had been approved, the Mexican Government offered to sell natural gas to a U.S. consortium headed by Tenneco at $2.60 per thousand cubic feet (Mcf). 1/ However, the administration disapproved this price, stating that we should not pay more than $2.16 per Mcf for Mexican gas since that was the price paid for Canadian gas. The Mexican price was linked to the 1977 Btu equivalent price of heating oil imported into the New York Harbor. The administration believes that Mexican gas will ultimately be priced on the same basis, which is now estimated to be $3.50 per million Btus in 1979 dollars. See our discussion of Mexican gas prices on page 6 for additional detail.

1/ One Mcf closely approximates 1 million Btus.

5 & 6. PLEASE PROVIDE DOLLAR COMPARISONS ON PRODUCTION AND TRANSPORTATION COSTS AS WELL AS DELIVERY PRICES OF: LNG IMPORTED FROM ALGERIA; ALASKAN NATURAL GAS TRANSPORTED THROUGH THE ALASKA NATURAL GAS TRANSPORATION SYSTEM; AND NATURAL GAS IMPORTED FROM MEXICO.

Due to unknown variables such as the transportation cost of delivering Alaskan gas to the lower-48 States and the final negotiated price of Mexican gas, we were unable to make meaningful cost and price comparisons of these sources to Algerian LNG. Also, the estimated prices for LNG are subject to change before the facilities are placed in operation. Once in operation, LNG prices can change in accordance with the escalation clauses in the contract. For example, one contract allows for an escalation of the price not to exceed 20 percent of future increases in the wage index in the petroleum industry and the U.S. cost of steel mill products.

The wellhead price of Alaskan gas transported through the Alaska Natural Gas Transportation System is derived in accordance with the provisions of the Natural Gas Policy Act of 1978. The act states that the maximum lawful wellhead price for this gas was $1.45 per million Btus in April 1977. To price this gas in subsequent months, the $1.45 will be adjusted by the monthly equivalent of the annual inflation adjustment factor. However, the transportation cost relating to Alaskan gas has not been negotiated, so it is not possible at this time to determine what the final delivered price will be. DOE officials estimate that it will range between $4.85 and $5.80 (in 1979 dollars) per million Btu's when the pipeline starts delivering gas in 1984-1985.

The price of imported Mexican gas also is impossible to determine at this time since negotiations between the United States and Mexico have not been finalized. The President's visit to Mexico in February 1979 was the prelude to reopening negotiations on the importation of Mexican gas and oil. However, these negotiations between the United States and Mexican Governments, which will begin within the next 2 months, will not determine the price paid for Mexican gas. The price issue will be left up to the oil and gas companies who must negotiate the price with the Mexican Government.

The table on the following page shows DOE's estimates of LNG prices which we adjusted to account for inflation and DOE's estimates on Alaskan and Mexican gas prices.

APPENDIX I

Comparative Costs of Natural Gas by Sources

Source	Estimated price delivered into pipeline - 1979 (per million Btus) (note a)
Algerian LNG:	
Distrigas (Everett, Mass.)	$ 3.11
El Paso I (Cove Point Md.) (note b)	1.78 - 1.94
(Elba Island, Ga.)	1.82
Trunkline (Lake Charles, La.)	3.15
Indonesian LNG:	
Pacific Lighting (Point Conception, Ca.)	2.79
Alaskan gas (note c)	4.85 - 5.80
Mexican gas (note d)	3.50

a/ Inflation factor is assumed to be 7 percent per year.

b/ Price varies depending upon the pipeline system into which the gas is delivered.

c/ Price estimates are based on DOE's projections for 1984 in 1979 dollars.

d/ Price estimate is based on DOE's projection of the cost of heating oil delivered into the New York Harbor in 1979.

It should be noted that other Alaskan and Mexican estimates have been made some of which are substantially higher than DOE's estimates. For example, a House of Representatives subcommittee estimates Alaskan and Mexican prices which are almost $1.00 and $.30 per million Btus higher, respectively, than DOE's estimates.

The fact that all of the estimates are subject to change makes any cost comparisons among Algerian LNG, Alaskan gas, and Mexican gas speculative and uncertain. Other variables, such as the Secretary of Energy's belief that we should develop our domestic gas resources from the lower-48 States and Alaska before importing gas, also will affect the amount and price of Mexican gas and LNG imports.

7. WHAT OWNERSHIP INTEREST, IF ANY, DO AMERICAN OIL COMPANIES OR AMERICAN GAS COMPANIES POSSESS IN SHIPS TRANSPORTING LNG TO THE UNITED STATES?

U.S. companies will build eight U.S. flag tankers for the transportation of imported LNG under the approved projects. Seven additional ships will be supplied by foreign countries, making a total of 15 ships for the three approved projects.

As stated in our report entitled "Liquefied Energy Gases Safety" (EMD-78-28, July 31, 1978), each U.S. and foreign flag LNG vessel is ordinarily owned, leased, or chartered by a separate subsidiary company of a larger firm. As shown in the table on the following page, two of the three projects utilize LNG tankers furnished by American gas companies. Each of the six U.S. built ships for the El Paso I project is or will be owned by separate subsidiaries of the El Paso LNG Company which is owned by the El Paso Company. The three foreign built ships are owned by the El Paso Maritime Company, a wholly-owned Liberian subsidiary of the El Paso Natural Gas Company, which is also owned by the El Paso Company. The two U.S. built ships for the Trunkline project are or will be furnished by Lachmar, a three-way partnership of subsidiaries of Panhandle Eastern Pipeline Company, General Dynamics Corporation, and Moore McCormack Bulk Transport, Inc.

Project	U.S. built & U.S. flagship	Foreign built & foreign flagship	Total	Amer. gas co. ownership
Distrigas	-	1	1	-
El Paso I	6	3	9	El Paso LNG Co.
Trunkline	2	3	5	Lachmar
	8	7	15	

8. TO WHAT EXTENT HAVE AMERICAN UTILITIES PRESENTLY CONTRACTED TO BUY LNG?

The LNG import projects represent contracts between the exporting countries and the U.S. gas companies. The gas companies will receive the regasified LNG and will use it to meet their contractual obligations to supply natural gas to their primary customers--local distribution companies (utilities)--and to other customers--industrial users and electric generation plants.

In 1977, gas companies supplied about 83 percent of total gas sales to gas utility companies for distribution to residential, commercial, and industrial users. Approximately 8 percent was supplied directly to industrial users for boiler fuel and the remaining 9 percent directly to electric generation plants.

Congress of the United States
House of Representatives
Washington, D.C. 20515

December 14, 1978

Mr. Elmer B. Staats
Comptroller General of the United States
General Accounting Office
441 G Street, Northwest
Washington, D. C. 20548

Dear Comptroller General:

Within the last couple of weeks, PEMEX chief Diaz Serrano announced the discovery of vast new oil and natural gas deposits in the Chincontepec region of central Mexico. This latest discovery when combined with the knowledge of significant natural gas supplies already available for export from Mexico raises some questions in our minds about the propriety and wisdom of growing U. S. use of liquified natural gas (LNG).

So that we might better understand the role prescribed for LNG in our national energy policy, we seek specific answers to the following questions through the General Accounting Office.

(1) Has U. S. consumption of LNG significantly increased in recent years?

(2) What percentage of our LNG supplies comes from foreign sources and what percentage comes from domestic sources?

(3) What effect will the enactment of the National Energy Act in the 95th Congress likely to have upon LNG consumption in the U. S.?

(4) What is the rationale behind our policy of approving U. S. purchases of LNG from Indonesia and Algeria at prices equal to or significantly above the price at which the Mexican government offered to sell the U. S. natural gas in 1977?

(5) Please compare in dollars the costs associated with the production and transportation as well as the delivery price of LNG imported from Algeria in contrast with natural gas imported by pipeline or ship from Mexico.

(6) Please provide dollar comparison on production and transportation costs as well as delivery price of gas from the following three sources:

(a) LNG imported from Algeria

(b) natural gas tapped on North Slope and transported over land through the recently approved Alaska Natural Gas Pipeline for delivery into the continental U. S.

(c) natural gas imported from Mexico via pipeline and/or ship

(7) What ownership interests, if any, do American oil companies or American gas companies possess in ships transporting LNG to the U. S.?

(8) To what extent have American utilities presently contracted to buy LNG?

(9) Given the dangers associated with transporting and using LNG and its relatively high delivery prices, why is the Department of Energy approving additional contracts for the purchase of imported LNG when natural gas is available from sources closer to home?

(10) Please forward to us copies of any previous reports compiled by the GAO relating to LNG.

It is conceivable that some of these questions have been partially answered in previous GAO investigations. But the remainder flow from new developments which need to be taken into account in the formulation of our national energy policy. We appreciate your cooperation in providing us with answers through your good offices.

Sincerely yours,

DON J. PEASE
Member of Congress

MAX BAUCUS
Member of Congress

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