INDUSTRY AND ENERGY DEPARTMENT WORKING PAPER
ENERGY SERIES PAPER No. 9

Current International Gas Trades and Prices

November 1988

CURRENT INTERNATIONAL GAS TRADES AND PRICES

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ABSTRACT

This paper provides a fairly comprehensive summary of the prices paid for natural gas that is traded between countries and general information about these trades. It focusses on the current contracts but also explains negotiations underway in some countries to obtain future gas imports. These prices are important to developing countries because they are the prices with which their pipeline gas or liquefied natural gas (LNG) exports would compete. The price examples also can be illustrative to countries seeking to reach gas pricing agreement with potential importers or exporters.

Unlike oil, gas is not traded widely internationally and therefore there is no daily, published international reference price for gas. With only sporadic news in the trade press regarding natural gas, it is difficult to keep abreast of the status of international gas trading. This paper is intended therefore to serve as a reference for Bank staff and to answer the requests that the Bank receives for information on the status of gas trades between countries and the prices in these trades.

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I. INTRODUCTION

The purpose of this paper is to provide a comprehensive listing of international natural gas prices; that is, the prices of natural gas traded between countries. It is a revision of Energy Development Information Note No. 9, issued in May 1988 and has been expanded to include some information about the international gas trades. No attempt has been made to provide domestic natural gas prices except in a few instances for comparative purposes. Depending on the country, the import/export prices can be very open or extremely confidential. This paper reports on gas prices obtained on a non-confidential basis from the trade press, industry specialized groups such as Cedigaz and the Institute of Gas Technology and based on the latest information available.

Natural gas reserves are found in about ninety countries worldwide (see Table 1) and there is production in some 70 countries, similar to the number of countries producing oil. However, unlike oil which is widely traded internationally, only about 15% of natural gas production is marketed beyond national boundaries. Furthermore, most of the gas volume traded internationally is attributable three major gas importers: (1) imports by the United States from Canada, (2) Japanese LNG imports and (3) Western Europe imports which are about-one-half of its natural gas needs. The trade between developing countries is almost non-existent although there are some opportunities which could be developed. The Middle East with huge gas reserves and limited domestic demand beyond the petrochemical industry is looking for eventual exports both to European and Far East markets.

This year, the international gas market has been particularly active with strong competition in the European market as the Soviets, Norwegians and Algerians try to line up future sales agreements with Western European buyers. The world LNG market has become reactivated and its once dismal prospects appear to have been reversed. This is largely due to a more flexible and realistic attitude on the part of the exporters as to pricing and take-or-pay policies in order to keep LNG competitive as an energy source. Part of this realistic attitude comes from the fact that the exporters have high sunken fixed costs and have little choice but to continue to export. For example, the Algerians have been seeking to renew or expand exports to the United States. Potential new exporters, Norway and Nigeria, are also looking at the U.S. LNG market for the future. In the Far East, Japan, Taiwan and Korea are or will soon by LNG importers and a number of gas producing countries are looking to these Far East markets.

Unlike crude oil for which there are widely publicized international reference prices, there are no uniform international gas prices. Instead they are determined on a very local basis, depending on the costs of exploration and development, transmission costs and the prevailing prices in the market in which the gas competes. Nonetheless, the price in most international contracts is changed periodically based on an escalator or price adjustment clause linked to crude oil or oil product prices in the consumer country. Therefore, the gas prices worldwide tend to fall within a prescribed range, ie

$2.00-$3.75/MMBtu. (See page 3 for Terminology and Measurements Used) In some cases, especially Japan, international gas prices fell less than expected in the 1985-1986 oil price crash because the contract prices were linked to artificially high official selling prices of crude oil rather than to the more market-reflective spot oil prices. Worldwide, in the future, it is likely that LNG and pipeline gas export prices will be related to actual or spot oil prices rather than official oil prices in order to better reflect market realities.

In the Far East, Japan has experienced a price drop in its LNG imports and it now pays an average CIF price of $3.60/MMBtu. Within Europe, there has been a trend for international gas import prices, to be negotiated downward from the pricing formulas in the original pipeline contracts to about the $2.20-$2.70/MMBtu range in order that the gas can compete in the market. By comparison, the price of Canadian exports at the U.S. border is about $2.00/MMBtu.

There are some global trends in international gas trades. New pricing terms or different contractual arrangements (i.e. flexible take-or-pay or open access transportation systems) that may emerge in one country may soon be copied in others. It is interesting to note that in Europe, where the gas monopoly companies had always rebuffed the concept, the common carrier issue is emerging whereas an open access or common carrier system has already taken hold in the United States. Basically, common carrier involves the direct purchase of natural gas by end use customers from the producers with pipeline companies providing transportation-only on a non-discriminatory basis without actually buying and reselling the gas in their own name.

The following sections of this paper highlight the prices and trades: II. Western Europe, III. Japan/Asia, IV. Middle East/Africa, V. Latin America and VI. North America. These prices are relevant to developing countries since these are the prices with which pipeline gas or LNG exports from developing countries must compete. They can be illustrative to countries seeking to reach gas pricing agreements with potential importers or exporters. Furthermore, gas exports from developing countries must also compete with alternative sources of energy (oil products, coal or hydropower) in these markets but the prices given in this report have been renegotiated to be market sensitive so that they already reflect that competition.

TERMINOLOGY AND MEASUREMENTS USED

Take-or-Pay	=	Common terminology for the contractual requirement of a gas purchaser to pay a seller for a contracted volume of gas (or fraction thereof) even if the purchaser cannot take the gas.
Interstate Pipeline Companies	=	A term used in the U.S. for pipeline companies that sell gas beyound the boundaries of a State and are therefore subject to Federal regulatory jurisdiction.
1 Mcf	=	Thousand Cubic Feet
1 MMcf	=	Million Cubic Feet
MMcfd	=	Million Cubic Feet Daily
Bcf	=	Billion Cubic Feet
Tcf	=	Trillion Cubic Feet
MMBtu	=	Million British Thermal Units
Mcm	=	Million Cubic Meters
Bcm/y	=	Billion Cubic Meters Annually
1Mcf	=	1 MMBTU (approximate)*/
1 Cubic foot	=	.0283 cubic meters
1 cubic meter	=	35.3 cubic feet
LNG	=	Liquefied Natural Gas

*/ Some contracts are written in price/MMBtu whereas others are written in price/Mcf. However, for purposes of this paper, the units are used interchangeably in discussing contract pricing terms.

Table 1

PROVED NATURAL GAS RESERVES
1988
(billion cubic meters)

	1987	1988
NORTH AMERICA	8171	8040
Canada	2746	2725
United States	5424	5315
LATIN AMERICA	6536	7115
* Argentina	671	758
* Bolivia	137	142
* Brazil	96	105
* Chile	120	120
* Colombia	113	115
* Ecuador	114	114
* Mexico	2146	2119
* Peru	55	340
* Trinidad-Tobago	462	460
* Venezula	2622	2842
WESTERN EUROPE	5553	5496
Austria	12	12
Denmark	126	123
France	33	34
Germany, Fed Rep	182	179
Greece	4	4
Ireland	53	51
Italy	290	290
Netherlands	1815	1770
Norway	2296	2285
Spain	25	24
United Kingdom	634	644
Yugoslavia	83	80
EASTERN EUROPE	41748	42401
Albania	7	10
Bulgaria	5	5
Czechoslovakia	11	15
Germany, Dem Rep	200	187
* Hungary	125	119
* Poland	165	167
* Romania	235	198
USSR	41000	41700
AFRICA	7248	7278
* Algeria	3000	2950
* Angola	50	54
* Cameroon	110	110
* Congo	70	69
* Egypt	290	325
* Equatorial Guinea	24	24
* Gabon	17	16
* Ivory Coast	100	100
Libyan Arab Jam	728	727
* Madagascar	0	2
* Morocco	4	3
* Mozambique	65	65
Namibia	28	28
* Nigeria	2400	2407
* Rwanda	40	50
* Somalia	6	6
South Africa	28	50
* Sudan	85	85
* Tanzania	118	118
* Tunisia	84	88
* Zaire	1	1
MIDDLE EAST	26654	30183
Abu-Dhabi	2700	5197
Bahrein	204	198
Dubai	133	142
Iran	13860	14000
Iraq	746	1000
Israel	1	1
* Jordan	0	28
Kuwait	1167	1205
* North Yemen	17	105
Oman	229	272
Qatar	4440	4440
Ras-Al-Khaimah	35	34
Saudi Arabia	2675	2845
Sharjah	272	311
* Syrian Arab Rep	142	372
* Turkey	33	33
FAR EAST	9740	10170
* Afghanistan	64	61
Australia	2089	2282
* Bangladesh	354	360
* Burma	268	268
Brunei	340	331
* China	870	900
* India	906	1005
* Indonesia	2265	2367
Japan	30	40
* Malaysia	1501	1487
New Zealand	145	148
* Pakistan	635	626
* Papua New Guinea	44	86
Taiwan	25	25
* Thailand	204	184
GRAND TOTAL	105,650	110,683
Total Borrowing Member Countries	18,239	19,138

*/ Borrowing member countries
Source: CEDIGAZ "Natural Gas in the World in 1987"

II. WESTERN EUROPEAN GAS MARKET

General

Natural gas has not penetrated the energy market in Western Europe as greatly as it has in the United States. In Europe, gas accounts for about 16% of primary energy consumption compared to about 45% for oil. Gas consumption in Western Europe totals about eight trillion cubic feet annually. By contrast, natural gas accounts for about one-fourth of the U.S. energy market. The difference is largely attributable to the fact that natural gas has not penetrated the electric power sector in Europe. Nonetheless, with large supplies coming onstream and environmental concerns with nuclear and coal power, natural gas could become a more important fuel for power generation. Indeed it is to the electric power sector that Norway hopes to sell its large gas supplies scheduled to come onstream in the mid-1990s.

On the other hand, transporting gas in Europe often involves transportation through the gas networks of other countries, which are operated by national monopolies. Producers are seeking to make sales to customers, especially to electric power utilities and have transportation-only arrangements with these pipeline monopolies. They are resisting becoming common carriers, a system which has become prevalent in the United States. It could well be that as producers seek to aggressively market their gas the common carrier systems will begin to make inroads in Europe. Spot sales are virtually non-existent in Europe, but they too could begin to surface as customers hedge some of their purchases on this basis.

Natural gas produced within Western Europe currently accounts for about one-half of the gas consumption, down from 77% in 1978. The decline is due to decreasing supplies especially from the Netherlands and to increased demand. The shortfall in supply is being met by gas imports from Algeria, the Soviet Union, and to a far lesser extent, Libya (See Table 2). In the future, Norway, the USSR and Algeria will figure prominently as the key suppliers.

Because of competition between oil and gas by end users, West European gas import prices are generally linked to world oil prices through pricing provisions tied to the price of oil products. However, if there were major markets which used coal, competition with coal might instead be one of the determinants of gas pricing. In fact, a proposed Norwegian sale to the Netherlands includes coal in the pricing formula.

Table 2

WESTERN EUROPE'S NATURAL GAS TRADE IN 1986
(billion cubic feet)

		Import Sources							
Country	Exports	Imports	USSR	Neth.	Norway	Algeria	Libya	W. Germany	Denmark
Austria	-	143	138	-	-	-	-	5	-
Belgium/ Luxembourg	-	316	-	168	57	91	-	-	-
Denmark	21	-	-	-	-	-	-	-	-
Finland	-	44	44	-	-	-	-	-	-
France	-	906	313	193	129	271	-	-	-
Great Britain	-	448	-	-	448	-	-	-	-
Greece	-	-	-	-	-	-	-	-	-
Ireland	-	-	-	-	-	-	-	-	-
Italy	-	705	270	152	-	283	-	-	-
Netherlands	1,233	59	-	-	59	-	-	-	-
Norway	920	-	-	-	-	-	-	-	-
Spain	-	87	-	-	-	57	30	-	-
Sweden	-	8	-	-	-	-	-	-	8
Switerland	-	55	-	21	-	-	-	34	-
West Germany	39	1,463	520	699	227	4	-	-	13
TOTAL	2,213	4,234	1,285	1,233	920	706	30	39	21

Source: Cedigaz

Source: Natural Gas in Western Europe: Structure, Strategies, ans Politics

By: Harvard University Energy Studies, 1987

Soviet Exports

The USSR has contracts to export or exports natural gas to fourteen countries. besides Eastern Europe, the USSR currently supplies Austria, West Germany, Italy, Finland, France, Belgium and Turkey and has a contract with Greece. It has held supply discussions with Spain and some Scandanavian countries. Table 3 summarizes the quantities of current and projected USSR natural gas exports.

Table 3

Soviet Natural Gas Exports 1970-95 (BCM)

	1970	1975	1980	1985	1986	1987	Mid to late 1990s	
							ACQ*	Possible Range
Austria	1.0	1.9	2.9	4.2	4.0	3.9	3.9	3.4-4.4
Federal Republic of Germany (including West Berlin)		3.1	10.7	12.4	15.3	17.3	19.3	16-25
Italy		2.3	7.0	6.0	8.0	8.6	12.3	10-15
France			4.0	6.8	9.3	8.8	8.0	6-12
Finland		0.7	0.9	1.0	1.2	1.6	1.2	1-2.5
Turkey						0.5	3.5	3-6
Switzerland							0.4	0.36
Greece							1.5	1-3
Sweden								0.5-1.5
Total Western Europe	1.0	8.0	25.5	30.4	37.9	40.7	50.1	41-68
East European 6	2.4	11.3	26.6	34.7	37.2	39.3		55-65
Yugoslavia			2.1	3.6	4.0	4.4		6-7
Total	3.4	19.3	54.2	68.7	79.2	84.4	50.1	102-140

* Annual average contract quantity.

Source: International Gas Trade in Europe: The Role of the Soviet Union by Jonathan P. Stern, Royal Institute of International Affairs, London.

The pricing provisions of the Soviet natural gas export contracts to Western European nations remain confidential, but from press accounts and industry rumors, it can be surmised that the gas is priced competitively with other European gas supplies as well as with alternative fuels. The base price is believed to originally have approximated $4.00/MMBtu with some fluctuations to individual countries. Taking into account what is believed to be the adjustment clauses, Soviet exports are now estimated to be priced in the $2.00-$2.50/MMBtu range for Western European importers at their borders.

Greece

Greece has signed a 25-year contract to import up to 1-1.2 billion cubic meters annually (Bcm/y) beginning in 1992 from the USSR. Volumes could reach 2.4 Bcm/y by the year 2002. The gas will be transported via a 700-kilometer pipeline from the Bulgarian border which together with the distribution networks, will be the same grid that will be used for Algerian LNG imports and distribution. The cost of the transmission line is estimated at $1 billion and the cost of the domestic distribution systems in Athens, Larissa and other cities is another $1.2 billion. Presently Greece has no gas grid. No pricing or financing terms were announced in what is believed to be a 25-year contract, but countertrade will be involved to offset supply payments. Together with the supplies from Algeria, natural gas should account for 13% of Greece's primary energy consumption by the end of the century.

Sweden

A letter of intent has been signed so Sweden might be added to the list of importers of Soviet gas beginning around 1992. It has not yet been decided whether the gas would be transported through a Danish or West German pipeline route. Alternatively, the gas could be imported through Finland by extending the existing Soviet pipeline to Finland which has a capacity of about 1 Bcf/d. Depending if the latter route is selected, Finland might then buy more Soviet gas.

Sweden is currently supplied by Denmark, but is seeking additional volumes totalling 2-3 Bcm/y and is using its leverage to obtain the lowest prices from exporters. Denmark is angling for more export volumes but Sweden seeks to diversify supplies. Norway (Statoil) would also like to supply the Swedish market, but has taken the posture that the additional Swedish import volumes would be too small to warrant building pipelines from both the USSR and Norway. The usage of gas for Swedish production, which is currently based largely on nuclear power, is key to getting sufficient gas demand for any major pipeline investment. The USSR may be willing to sell the gas initially at break-even or even below cost to capture the Swedish market.

Existing Algerian LNG Exports

Algerian exports to Western Europe have increased dramatically since 1978 due initially to the development of its LNG trade. Since 1983, however, the pickup in sales has been due to increased pipeline trade with Italy through the 48" Trans Mediterranean pipeline. Algeria is vigorously pursuing new LNG contract customers.

Despite pricing disputes, Algerian LNG exports have increased to 14 Bcm/y in 1987. Algeria exports to the United States, Spain, France, Italy, Belgium and West Germany, the latter through the Gaz de France network. Algerian contracts with European purchasers are priced on an FOB basis.

Italy, which has had a contract for 12.3 billion cubic meters annually of gas through the TransMed pipeline is reportedly paying $2.10/MMBtu, FOB. The contract was renegotiated in October 1986, and until then, it paid $.36 less than the European LNG purchasers. Italy buys some LNG on the spot market to keep its LNG terminal operational.

Algeria remains in pricing disputes with its European customers. After almost two years of fruitless negotiations, during which Algeria reportedly has been seeking $2.50 FOB, the talks remain deadlocked but deliveries continue. The contract talks are supposedly focussing on an LNG indexation against a basket of fuels at FOB prices, starting at around $2.40-$2.50/MMBtu or even $2.25/MMBtu. Either would be much less than the original contract prices. Take-or-pay remains a point of negotiation whereas Algeria obviously seeks more stringent terms, but the buyers are likely to give only assurances of volumes. Formal, binding take-or-pay provisions are therefore not considered likely to be prominent in the newly negotiated contracts.

During the contract negotiations impasse, Sonatrach has been invoicing its European LNG customers less than they are paying. Sonatrach's price is the result of a 1986 provisional agreement that takes into account the drastic price drop in actual oil prices. It is based on the netback values of the eight crudes in the contract price escalation formula, plus $0.83/MMBtu extra. Spain (Enagas) and Belgium (Distrigaz) are deducting the $0.83. Belgium, who inaugurated the Zeebrugge gas import terminal in October 1987, has put their take-or-pay and pricing dispute before the International Chamber of Commerce where a decision is expected December 1988. Spain, whose contract contains most favored nation clause, has not been in negotiations.

Gaz de France, on the other hand, is billed differently. When the 1986 provisional pricing agreement expired, pending negotiation of a new pricing accord France reverted back to the 1982 contract pricing terms, based on an indexation formula of the official prices of a basket of 8 crudes. Now, however, they are billed the same as Belgium and Spain. During the contract negotiations for a more permanent pricing agreement, it had been suggested that the gas pricing agreement would become part of a broader bilateral cooperative agreement, but Gaz de France resisted and authorities have now stated that the pricing would be on a commercial, and not political, basis. The following table shows recent Algerian LNG prices.

Algerian LNG Prices ($/MMBtu)
FOB Invoice Price

4th Qtr. 87	1st Qtr.88	2nd Qtr.88	3rd Qtr.88	4th Qtr.88
$2.80	$2.77	$2.35	$2.58*	$2.31**

* Invoiced price - Price paid by France was approximately $1.97; Belgium and Spain paid about $1.75 FOB.

**Invoiced price - Price paid by France, Belgium and Spain was $1.48 FOB

Proposed Algerian Exports

In West Germany, the approval process for a LNG terminal at Wilhemshaven should be completed by the end of 1988. The facility would be used in the mid-1990s for Algerian and presumably Nigerian imports whereas Algerian volumes are now imported via France. The gas would be used to diversify it sources of supply, but Ruhrgas has indicated that this project would be dependent on Algeria being flexible in its pricing terms, tailoring them to local market conditions. In theory, however, Ruhrgas has contracted for its gas needs until the Year 2000.

An Algerian sales agreement with Greece has been negotiated. Volumes in this $1.4 billion project would be roughly 12 billion cubic meters over a 20 year period (600 million cubic meters per annum) to be used in peak shaving around Athens to offset shortfalls in Soviet gas deliveries. The Sonatrach contract allows for offtake flexibility (25% of volumes) in the build-up years. The price is reported to be $2.25/MMBtu FOB with the price based on a formula related to various crude oil prices which are competitive with international oil prices. Payment details have not been worked out, but they could include cash and countertrade.

Spain imports Libyan and Algerian LNG and sales are handled by the state gas company, Enagas, which is rapidly expanding its transmission and distribution networks, including the construction of pipelines to hook up new LNG terminals at Cartagena and Huelva to the national grid and to link its network to France in the 1990s which would allow it to import gas from Norway. For new LNG supplies, Enagas will market the LNG to major users but at least in one case, a local distribution company will market the gas to local customers and smaller industrial customers.

Sonatrach has entered into talks to participate in the LNG terminal and pipeline network to be built at Setubal near Lisbon although no start-up dates for construction or deliveries have been set. A Shell-led consortium is also interested in investing in the terminal which presumably could then be used to handle Nigerian LNG volumes. The Portugese Government has made institutional changes to prepare for eventual LNG imports. It recently changed its laws and declared that gas was not a state monopoly in order to allow private ownership of the LNG terminal facilities. It has also indicated that local gas distributors will handle sales to end users. Portugal is still keeping open the option of connecting to the Spanish pipeline in order to import Norwegian gas, but is waiting for assurances that Spain links with the French network. After a three year delay, Yugoslavia is closer to signing a contractual arrangement with Sonatrach calling for deliveries of 1 Bcm/y beginning in 1995.

A contract was signed in April 1988 with Turkey (BOTAS) to import 40 billion cubic meters of Algerian gas over 20 years (2 Bcm/y) beginning in 1992, to be brought into the Sea of Marmara at Breglesi. This would augment Soviet imports and diversify sources of supply. (The gas would go into the main transmission system handling the Soviet supplies.)

Sonatrach has reached agreement to supply British Gas of the United Kingdom with 600 million cubic meters over the next 2-to-3 years for peak shaving; prior LNG deliveries from Algeria ceased in 1981. The pricing arrangement calls for $2.15/MMBtu FOB for winter (peak shaving) deliveries; this price is slightly higher than other Algerian prices due to its usage in peak shaving.

Libyan Exports

Libya is offering attractive terms in order to retain Spain's contract of one Bcm/y and to recapture Italy as a customer. Libya is also in the process of negotiating gas export contracts with Greece, Turkey and Yugoslavia. Libya signed a broad trade accord with Turkey in summer 1988 which included LNG imports by Turkey, but it not clear that Turkey would be in a position to purchase substantial volumes from Libya in additon to the LNG from Algeria.

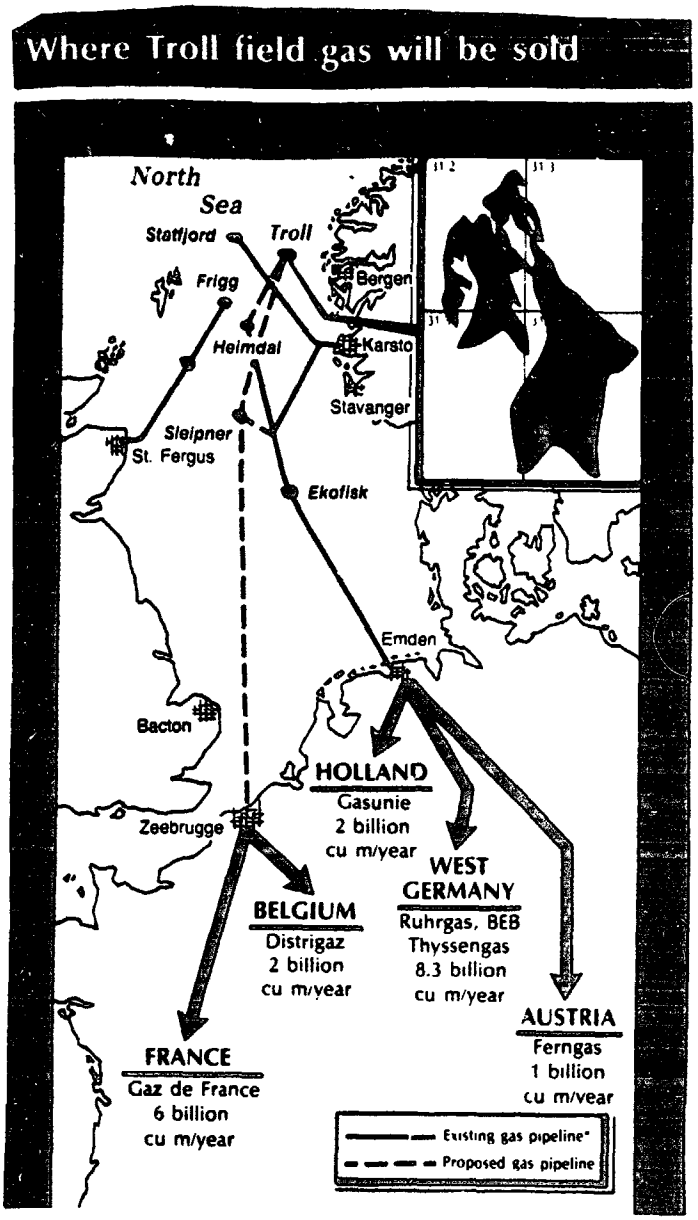
Norwegian Exports

Norway is intensifying its efforts to line up customers for the 1990s when new supplies from the Troll, Sleipner and other fields come onstream. (See Figure 1) To market the gas, contracts are more flexible and they will no longer be field specific whereby purchasers were required to take the entire output from a field. Instead, they will be based on sale/purchase volumes. Norway has established a new gas marketing mechanism called the Gas Negotiating Committee which represents Statoil, Saga and Norsk Hydro, which is hoping to increase sales in the electric power sector throughout Europe. Norway is holding talks with Italy and the UK on gas supply agreements and renewing efforts to capture a share of the Swedish and Danish markets.

Three years ago Norway had tried to sell Sleipner gas to the UK but the British Government did not go along. However, with the deliveries from the Frigg field to soon end and the development of the giant Troll field, the British are willing to reopen talks with the Norwegians. The question for the Norwegians is how to meet the supply competition from British Gas.

Norway plans to construct Zeepipe, the longest (1300 kilometer) subsea system in the world, to transport Sleipner, Troll and Heimdalgas to the Continent beginning in 1993, 1996, and 1998, respectively. So far, Norway has contracts to sell gas from the Zeepipe to Spain, France, Belgium, Italy and Austria (see Figure 2) Gasunie and Ruhrgas will purchase Sleipner gas but will continue to purchase through the existing Norpipe line which terminates at Emden, West Germany. Other countries could continue to purchase gas from Zeepipe through a spur connecting it to Norpipe. Norpipe has a throughput of 2.1 Bcf/d and moves gas from Ekofisk (Phillips), Statfjord (Statoil), and Ula (BP) fields to Emden, West Germany and there could be a capacity problem in trying to move the Sleipner gas. Ekofisk gas is priced slightly higher than Sleipner-Troll gas; however, the contracts for Ekofisk expires in 1999 and clients may not wish to renew these even if Phillips boosts its productive life. It has been suggested that a clause could be written into the Sleipner-

Figure 1



SPAIN
Enagas
1-1.y billion
cu m/year

Source: International Petroleum Encyclopedia 1988

Troll contracts that will not allow other Norwegian gas to be sold to buyers at a price undercutting that of Sleipner-Troll gas. It would therefore make new Norwegian field development difficult.

Norwegian gas terms are held in secrecy, but Norway adheres to the principle that the price will allow the buyer to resell it to customers at full market value in the individual countries. A key issue affecting the economics of the exports is the transportation arrangements for country customers that can be made through the intermediary pipeline companies such as Gaz de France and Ruhrgas. It is believed that Norwegian exports to Austria are only marginally commercial. In the latter arrangement, Ruhrgas of West Germany buys and transports the gas, then resells it to Statoil at the Austrian border. Since Ruhrgas is resisting becoming a common carrier pipeline, legally it prefers this arrangement to one of providing transportation services.

Norway has concluded an agreement to sell 1-1.4 billion cubic meters annually of Troll gas to Spain (Enagas) when it comes onstream in 1996, for a period of 30 years. Volumes will be flexible, but by the Year 2005 Norwegian gas may supply up to one-third of Spain's needs. There are no details on pricing but, again, a key element will be the tariff charged by Gaz de France for transport through its system.

The Netherlands

The Norwegian Gas Negotiating Committee and a Netherlands utility association signed a letter of intent in August 1988 for sales of 2 Bcm/y of natural gas for twenty years to two new 600 MW electric power plants. This would be Norway's first sale into the power sector in Europe. Dutch plans to diversify energy sources call for the use of coal and nuclear power in the electric power sector; since the new plant would otherwise have used coal, the price includes some linkage to coal. Gasunie, the Netherlands gas monopoly, is not involved in the deal as it is a direct sale. This proposed sale is also important because it raises the unresolved question of common carrier pipelines. As a result, it may not be approved by Dutch authorities or they could force Gasunie participation. The Norwegian Government must also approve the sale. Norway has the flexibility of choosing from which fields it will source the gas.

Dutch export sales are linked to spot market oil product prices, and with this market competitive pricing, Gasunie is trying to fight the continuing soft market. Gasunie and Ruhrgas, the West German utility, are reportedly disputing the basis of their pricing basis; Ruhrgas is pushing for at least some linkage to the less volatile coal prices which Gasunie is resisting.

United Kingdom

With the privatization of the electric power sector, it is anticipated that more, smaller natural gas-fired plants will be used, thus increasing demand for natural gas. Besides Algeria, North Sea producers would like to fill this demand and market their gas in the United Kingdom but there

has been some question whether they could avoid dealing with British Gas who is believed to charge huge mark-ups. Under the terms of its privatization, British Gas was to have moved to pricing transparency and to have opened its system but it has remained a monopoly. Even so, the high pipeline changes and the lack of transparent pricing had served to discourage third-party deals. However, this may change. Although it has some staunch regulatory supporters, British Gas was dealt a blow with the October 1988 release of a Government Commission's report that inquired into British Gas' pipeline tariffs and recommended that the company shed pricing secrecy and publish contract terms, end discriminatory pricing policies and limit North Sea gas purchases to 90% of any field.

It has been under discussion that the price of gas from a North Sea field to supply a power plant in Scotland would be on a coal-related basis. Currently, this is equivalent to $1.80/MMBtu. The gas would be supplied from the North Sea by British Petroleum, who would bypass British Gas and build and operate an offshore pipeline to the St. Fergus terminal.

III. THE JAPANESE/ASIAN TRADES

General

Gas consumption continues to rise in Asia due to increased consumption of domestic gas resources by India and Thailand as well as the introduction of LNG into the South Korean market beginning in 1986. Since the Pacific Rim countries are projected to have the highest rate of energy growth in the future, this trend of increased gas consumption should continue. Japan currently accounts for almost three fourths of LNG imports worldwide; it is in the power sector that over seventy percent of the natural gas is consumed. Unlike in many countries where gas imports are the domain of gas utility monopolies, in Japan, private electric power and natural gas utilties are responsible for the importation and marketing of the LNG.

Prices in Asian LNG trades are expressed in terms of a delivered price as opposed to the FOB system that characterizes Algerian exports to Western Europe. The Asian market is somewhat in a state of flux as Japan is trying to adjust its prices with Indonesia and meanwhile the Indonesian-invoiced price is not being paid. The discrepancy involves the issue of billing based on the official versus actual or spot prices of crude. Sensing a buyers' marekt, LNG purchasers Taiwan and Korea are negotiating for tough pricing terms which Japan may seek to copy.

Within Asia, these three countries are the existing or soon-to-be future LNG importers, along with possibly Hong Kong. Indonesia, Malaysia and Brunei are the present LNG exporters in the Pacific, soon to be joined by Australia. Currently there is no international pipeline trade, but this will change with completion of the second phase of the Malaysian Peninsular Gas System. There is just beginning to be talk of more regional pipeline trade--a concept being advanced by Malaysia.

Korea

Indonesia and Korea are in a pricing dispute but since 1986 when deliveries began, Korea has been lifting its contract volumes. The price is linked to a crude basket and the gas is used primarily in the domestic sector.

Taiwan

Indonesia (Pertamina) and the Chinese Petroleum Corporation signed an agreement in March 1987 for the first shipments to begin in 1989 with regular deliveries commencing in 1990. The volume terms in the contract are flexible especially in the build-up years. The CIF price may be below that charged to Japan because of differences in transportation costs. The price is based on a basket of Indonesia crudes along with a transportation adjustment.

Malaysia

In addition to LNG exports to Japan, Malaysia plans initially some 150 MMcf/d of gas pipeline exports to Singapore as part of its Peninsular Gas Utilization Project and has just awarded the construction contract of its second phase. Exxon, the producer, is finalizing its price negotiations with Petronas, the Malaysian state oil and gas company although Petronas already has a sales contract with Singapore calling for a price of about $2/MMBtu. The price is reportedly based on medium quality fuel oil, which it would displace in the power sector, plus a premium. By contrast, Exxon is negotiating a domestic price with Petronas which could be more in the $1.50/ MMBtu range initially.

To diversify its exports, the Prime Minister of Malaysia recently announced a preliminary political accord had been reached to negotiate gas sales to Thailand although the latter has plentiful supplies of its own. He cited attractive pricing, including trade and currency concessions, and deliveries to the eastern Thai border, where a domestic line doesn't yet exist as the rationale for the project. Thai private and state oil companies however consider the possiblity remote.

Japan

The average landed price of LNG delivered to Japan was about $3.60/MMBtu CIF in early 1988; this is a sharp reduction to the $5 price in 1985 and the high of $5.83 in 1981. (Delivered CIF prices do not include regasification and all contract prices are expressed in U.S. dollars.) Japan has retrospectively changed the price linkage in its contracts to market or actual prices rather than to official prices of crude oil. The issue is under negotiation and an interim agreement was reached whereby Japan recently paid $2.90/MMBtu based on a $15 reference price for oil. In addition, Indonesia and Malaysia have been resisting renegotiation of take-or-pay clauses in their contracts with Japan. The following table shows the price trend for Japanese LNG imports.

CIF Price of LNG Imported by Japan
($ per millions of Btu) ($/MMBtu)

Exporter	1981	1983	Summer 1987 Price	February 1988 Price
Abu Dhabi	6.61	5.47	3.20	3.28
Indonesia	5.59	5.14	3.53	3.82
Brunei	5.97	5.16	3.19	3.18
Malaysia	--	5.19	3.33	3.36
Alaska	5.95	5.12	3.15	3.17
Average	5.83	5.16		3.60

Source: Japanese Ministry of Finance; Cedigaz

The Cook Inlet contract has been renegotiated and will run from 1989 to 2004. It has more flexible pricing terms, allowing plus or minus $.30 per MMBtu per month as conditions warrant. The current price is $2.85/MMBtu CIF Japan and quantities run 50 Bcf/annually.

In addition to the Alaskan LNG imported annually from Cook Inlet, Japan could import LNG from the Alaskan North Slope now that such exports would be permissable under U.S. regulations. The so-called Trans Alaska Gasoline System (TAGS) would be expensive since it involves adding on the costs of transmission through an 800 mile pipeline before the gas is liquefied at the terminal near Valdez. The project needs the equivalent of $24/barrel to be economic and volumes would approximate 2 Bcf/d. It is believed that it will be tough to negotiate sales contracts with satisfactory prices with Far East (Japan, Taiwan and Korea) customers.

Australia

Exports from the Northwest Shelf to Japan are scheduled to begin October 1989 with volumes to reach full peak in the mid-90s.

China

China, with significant offshore deposits off Hainan Island has reached agreement with Atlantic Richfield Company on the domestic disposition of the gas. In addition, a feasibility study is being conducted on possible LNG exports to Japan and Hong Kong. The buyer would be a Japanese trading company, who reportedly has discussed a pricing framework based on steam coal rather than oil.

IV. MIDDLE EASTERN/AFRICAN GAS TRADES

General

As noted in earlier sections of this paper, Algeria and Libya export natural gas to Western Europe, and Algeria has reactivated its LNG exports to the United States. Within Africa, there is presently no regional trade between countries except for Tunisia which offtakes Algerian gas from the Trans Mediterranean Pipeline as it crosses through Tunisia to its subsea route to Sicily and then to Italy. A second pipeline under the Mediterranean which would link Spain to Algeria via Morocco is also under discussion, and the latter could then become a customer for Algerian gas.

With substantial gas resources in western Africa, there is potential for some regional gas trade and the Africa Technical Department is studying the options and constraints for these possibilities. The Middle East has substantial gas reserves, practically untapped with the exception of production dedicated to the petrochemical industry. Abu Dhabai exports LNG to Japan and Qatar plans to export gas from its huge reserve base to Europe or Pacific Rim countries. There is always speculation on the possibility of building an export line from one or several Middle East countries to Turkey. Then to reach markets in Western Europe would require a subsea line under the Aegean Sea to Greece or pipeline through Eastern Europe which would offer competition to the Soviets which they would not welcome.

Qatar

The first phase of the gas development from the giant North Field is scheduled for completion in 1990 but only gas liquids exports are planned initially. The first phase calls for 800 MMcf/d production of which one-half could go into fertilizer and petrochemicals for export. LNG export projects in the 1990s are planned with customers in Western Europe and the Far East.

United Arab Emirates

There are also small quantities of gas traded between the United Arab Emirates, Iraq and Kuwait, but no pricing information is available.

Iran

An end to the hostilities with Iraq should result in a boost in gas production for domestic utilization and interest in exports. The gas export line (IGAT) to the USSR is undergoing repairs and is about to be reopened. In addition, Iran has announced that the IGAT-II large-volume, nearly complete export line to the USSR, will be operational within a year.

Afghanistan

Afghanistan exports small quantities of natural gas to the Soviet Union but no details of the trade are known.

North Africa

Libya, Tunisia and Algeria have formed a new company to conduct feasibility studies on the proposed Transmaghrevine pipeline. Plans call for the sale of a total of 100 MMcf/d beginning in 1990 to Tunisia and Libya from Algerian fields. Volumes double in the next decade. In addition, Morocco is assessing its long term demand for natural gas and may open a dialogue with Algeria on the possibility of imports. Algeria now sells small volumes to Tunisia (one Bcm/y) from the TransMed line.

Nigeria

The Nigerian Government through the Nigerian National Petroleum Corporation (NNPC) will hold 60% equity in the Bonny LNG project with producers Shell, Agip and Elf Aquitaine also as participants. Shell is completing technical feasibility studies for what is termed a mini-LNG project. Skeptics to the project doubt the LNG could compete in the Western Europe market, but the Nigerians claim that 70 % of the volumes (13 Bcm/y) have been placed in Western Europe. Shell has leased tankers and is looking at taking an equity position in several LNG terminals in both Europe and the United States.

V. LATIN AMERICAN GAS TRADES

General

There is no Latin American natural gas market, per se, but there have been some pipeline trades between Bolivia and Argentina and between Argentina and Chile. Argentina had once considered an LNG project to the United States, but it is now considered highly unlikely. Even though many of the countries possess indigenous gas resources, the potential exists for trade between many of the countries since the gas fields of one country may be closer to those of a potential importer than the latter's domestic fields. The Technical Department in Latin American Operations within the World Bank has a study underway that is examining the potential for regional natural gas trades.

Argentina/Bolivia

According to reports, Argentina has renegotiated the pricing terms of the contract so that it will now pay Boliva $2.59/MMbtu at the border for 210 MMcf/d for the balance of a 20-year contract expiring in 1992. The contract has been key to Bolivia's export earnings. In what is considered a political settlement, Argentina pays 80% in hard currency and the balance in goods and services. In return, Argentina pays $117 million in back payments to Bolivia and refinances Bolivian loans. As a result of the settlement, Bolivia was able to reach agreement with Tesoro Petroleum Corporation who is a partner in the joint venture producing the gas.

Argentina/Chile

Argentina and Chile have signed a 20-year agreement calling for the purchase by Chile of a minimum of 500,000 cubic meters daily from the Loma de la Lata fields in Argentina. Volumes would increase to 2 million cubic meters/daily. Detailed studies are to begin soon. The accord does not mention price, start-up date for construction, project cost or financing details but both countries are directed to seek government and private sector financing for the pipeline. A new branch line from the Argentine-owned Center-West Pipeline would transport the gas over the Andes to Santiago. In return, Chile will supply Argentinian customers in the Cerro Redondo area in Santa Cruz Province. Pricing information is not available and it is unclear whether the two have ended a longstanding dispute over gas prices. Politics figure prominently in the outcome of the project.

Bolivia/Brazil

Deliberations had been underway for several years for a Bolivian gas export project to Brazil, with the intention of supplying 400 MMcf/d of gas to the Sao Paulo market; this project did not materialize because of new Brazilian gas finds and high transportation costs from the Bolivian fields. (Brazilian domestic gas will now supply that market.)

Rather, an accord was signed this summer which calls for the purchase by Brazil of some 5 MMcf/d of natural gas for a cement plant and the purchase of 100 MMcf/d to supply petrochemical facilities and a 500-600 MW electric power plant also in Bolivia. In an exchange arrangement, Brazil guarantees the purchase of electricity generated from the plant and also buys urea and polyethylene from these plants. Bolivia would construct the $300 million, 600 kilometer gas pipeline to the power plant and petrochemical facilities. Technical teams from the two countries are putting together the financing.

VI. NORTH AMERICAN GAS MARKET

General

North America has the potential to become a fully integrated market and, in fact, a northern continental gas market is emerging as Canada and the United States have been deregulating their gas markets. Canada has moved to a North American natural gas marketing concept, and as a result, Canadian gas sales to the United States have picked up to their previous levels of about one trillion cubic feet annually (See Table 4). Canadian and United States gas prices now closely resemble each other. The U.S. exports small quantities of gas to Canada and Mexico, but their imports from the latter were suspended. The U.S. exports some 50 Bcf annually of Alaskan LNG to Japan.

The U.S. Domestic Market

The U.S. market continues to experience a "gas bubble" which can be characterized by a situation whereby gas supplies exceed demand. Forecasters disagree when the bubble will disappear. To correct the current imbalance, new regulations allow and marketing instruments have been developed to stimulate the sale of gas that would otherwise be shut-in. Whereas in the past gas was generally sold on a long-term contract basis, almost one-half of gas supplies are now sold on a short term or spot basis. Furthermore, transmission pipeline companies are no longer the dominant purchaser of the gas and the seller to local distributors. Rather, in the interstate pipeline trade, some 43% is sold to distributors, 37% to marketers and brokers, and the rest to end users. Through the deregulation of most gas prices and these marketing arrangements, natural gas has been able to maintain its market share at about 17 trillion cubic feet annually despite the drop in the price of oil, the chief competitive fuel.

The 1987 average wellhead prices fluctuated between $1.65 per Mcf and $1.77, with the latter price being within a few cents of the 1986 average price. Current (1988) wellhead prices are in this same range. The city gate price which adds the transmission cost to the price paid to the producer but excludes any local distribution costs, averaged $2.80-$2.90 per Mcf in 1987.

The U.S. natural gas spot market price reached a high of $2.20/Mcf in January 1988 (See Table 5) due to market conditions and some complex regulatory factors which artificially boosted the price. */ Until then, spot prices had been far below these levels and they have fallen since.

Despite the downward look in prices, there is renewed activity in LNG as Algeria has become more flexible in pricing and delivery terms in order that its LNG is competitive in the U.S. In the longer term, when supplies are predicted to tighten as the gas bubble is worn off, Nigeria and Norway are also looking at supplying the U.S. with LNG.

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*/ See Energy Development Information Note No. 5, A Brief Explanation of the Turmoil in the U.S. Gas Industry, January 26, 1988.

Table 4

Summary of U.S. Natural Gas Imports, 1986-1987

Source	Volume (million cubic feet)		Percent Change	Average Btu/ Cubic Foot		Cost (thousand dollars)		Average Price (dollars/ thousand cubic feet)		Percent Change	Average Price (dollars/ million Btu)		Percent Change
	1986	1987		1986	1987	1986	1987	1986	1987		1986	1987	
Pipeline													
Canada	R 748,780	• 992,395	32.5	997	999	R 1,814,464	1,929,954	2.42	1.94	-19.8	2.43	1.95	-19.8
Mexico	0	0	-	0	0	0	0	.00	.00	-	.00	.00	-
Total	R 748,780	• 992,395	32.5	997	999	R 1,814,464	1,929,954	2.42	1.94	-19.8	2.43	1.95	-19.8
LNG													
Algeria	0	0	-	0	0	0	0	.00	.00	-	.00	.00	-
Canada	0	0	-	0	0	0	0	.00	.00	-	.00	.00	-
Indonesia	1,669	0	-	1,157	0	7,701	0	4.62	.00	-	3.99	.00	-
Total	1,669	0	-	1,157	0	7,701	0	4.62	.00	-	3.99	.00	-
Grand Total	R 750,449	• 992,395	32.2	997	999	R 1,822,165	1,929,954	2.43	1.94	-20.2	2.44	1.95	-20.1

- = Not applicable.
R = revised data.
• During 1987, Michigan Consolidated Gas Co. imported, on an equivalent Btu basis, 3,596,996,000 cubic feet of natural gas from Canada as part of an energy exchange for ethane exported to Canada. There was no cost reported. This exchange volume is excluded in calculating the average prices but included in the total volume imported.
Note: Totals may not equal sum of components due to independent rounding. Geographic coverage is the continental United States including Alaska.
Source: Energy Information Administration, Form FPC-14, "Annual Report for Importers and Exporters of Natural Gas."

Summary of U.S. Natural Gas Exports, 1986-1987

Source	Volume (million cubic feet)		Percent Change	Average Btu/ Cubic Foot		Cost (thousand dollars)		Average Price (dollars/ thousand cubic feet)		Percent Change	Average Price (dollars/ million Btu)		Percent Change
	1986	1987		1986	1987	1986	1987	1986	1987		1986	1987	
Pipeline													
Canada	9,203	3,297	-64.2	991	1,002	19,522	5,968	2.12	1.81	-14.6	2.14	1.81	-15.4
Mexico	1,896	2,125	12.0	1,055	1,051	6,610	6,764	3.49	3.18	-8.9	3.31	3.03	-8.5
Total	11,099	5,421	-51.2	1,002	1,022	26,132	12,732	2.35	2.35	.0	2.35	2.30	-2.1
LNG													
Japan	50,172	48,599	-3.1	1,010	1,010	146,106	152,863	2.91	3.15	8.2	2.88	3.12	8.3
Grand Total	61,271	54,020	-11.8	1,008	1,011	172,238	165,595	2.81	3.07	9.3	2.79	3.03	8.6

Note: Totals may not equal sum of components due to independent rounding. Geographic coverage is the continental United States including Alaska.
Source: Energy Information Administration, Form FPC-14, "Annual Report for Importers and Exporters of Natural Gas."

Source: Energy Information Administration/Natural Gas Monthly, July 1988.

Table 5

Natural Gas Spot Prices
U.S. Offshore Gas

Year	Month	U.S./$
1986		
	May	1.52
	June	1.44
	July	1.44
	August	1.41
	September	1.41
	October	1.39
	November	1.37
	December	1.36
1987		
	January	1.37
	February	1.39
	March	1.41
	April	1.41
	May	1.40
	June	1.37
	July	1.36
	August	1.34
	September	1.33
	October	1.34
	November	1.50
	December	1.80
1988		
	January	2.20
	February	2.00
	March	1.43
	May	1.10-1.45
	June	1.35
	July/August	1.65
	September	1.25-1.80
	October	1.65-1.70

Note: Prices quoted are for Texas Gulf Offshore but Onshore prices are the same or a few cents higher.

Canadian Exports to the U.S.

Canada has moved to a Western Hemisphere natural gas marketing concept by adopting policies beginning in 1985 that untied the Canadian export price from the floor price of gas in Toronto and allowed flexible (i.e. market) pricing. At the same time, Canadian domestic prices were deregulated; now the domestic prices are comparable to the export prices. Export prices have dipped in order to compete with U.S. domestic gas supplies and alternative fuels so that export volumes have again reached their previous levels of about one Tcf annually, which represents about 5 percent of U.S. gas consumption. U.S. exports to Canada, generally to Ontario province, while very small are also market competitive with Canadian domestic prices. The weighted average price of U.S. exports to Canada was $1.78/MMBtu in 1987, and this year, to compete with domestic prices in Ontario, the export price would be in this range.

Canada heretofore used a "surplus test" based on a minimum reserve-to-production ratio but it has been dropped in favor of a "market based procedure" whereby an assessment of the impact of the potential export on Canadian energy markets is done to determine if the export is in the best interests of Canada. The Eastern Canadian Provinces, which receive their gas from the Western Provinces, had preferred the surplus test, which would have been more restrictive in limiting exports.

The weighted average price for Canadian exports at the border for the year ending October 1987 was about $2.00/MMBtu (US dollars) compared to $2.66 for the same period the previous year; it is down slightly this year. This price calculation includes exports under both long term and spot contracts. The Canadian export price trend is as follows:

Canadian Average Export Price
U.S. Dollars/MMBtu

Year	Price
1985	$3.17
1986	$2.42
1987	$1.94
1988 (through August)	$1.88

This $1.88 weighted average price reflects an average price of $2.01 for long term contracts and $1.59 average for short term contracts (one-to-three months or spot basis) of $1.59. These long term contract prices are a few cents lower than those in 1987, and the short term prices are also below their average level of $1.84 in 1987 and $2.40 in 1986. It can be seen how this price drop helped export sales since in 1987 only one-half of contract volumes were exports. (Prices quoted for Canadian gas can vary depending if they are in U.S. or Canadian dollars; also, the calendar year does not match the Canadian October-based contract year which leads to discrepancies.)

It is useful to look at the import purchases by major interstate pipeline purchases **/ since these prices are not confidential and they are filed with U.S. regulatory authorities. It is interesting to note that this price has dropped to a level comparable to what the major interstate U.S. pipeline companies are paying its domestic producers:

Year	Price to Canada	Price to U.S. Producers
1985	$3.19	$2.85
1986	$2.53	$2.39
1987	$2.14	$2.12
1988	$2.00	$2.14

It is interesting to note that recently a longterm contract from Canadian (and U.S.) producers to a MidWest electric utility that was converted to natural gas from nuclear includes a linkage to steam coal prices in the pricing escalator.

Mexico/U.S. Trade

Mexican natural gas deliveries of 300 MMcf/d to the United States were suspended in 1984 due to low prices in the U.S. and alternative domestic uses for the gas. Nevertheless, if Mexico would increase its hydrocarbon production, which however would require substantial capital expenditures, supplies of natural gas surplus to their domestic needs would result. The U.S. remains the logical market for these exports.

The U.S. exports very small quantities of natural gas to Mexico along the Texas border where the Mexican pipeline system does not extend. The price has been about $3.00/MMBtu.

Algerian Exports to the United States

LNG deliveries to Maryland, the Boston area and Louisiana had been suspended but Algeria has shown new flexibility in pricing and take-or-pay provisions in order to recapture or even expand its market. Take-or-pay disputes had almost bankrupt Distrigas and Panhandle, the U.S. importers.

Algerian exports to the Lake Charles, Louisiana facility may resume, pending U.S. regulatory approval. A new contract between Sonatrach and Panhandle is based on the concept that the LNG would be sold to Panhandle when it gets a buyer; the price would then be netted back to Sonatrach who would have to agree to the terms of the resale since that determines their netback price. Regardless, the CIF price at current market conditions could not be above $2.00-$2.30 to be marketable since it would be competing with domestic

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**/ Major interstate pipeline purchases would include a small amount of LNG purchased by Distrigas but it would exclude direct sales by Canadian producers to end use customers.

supplies. It is estimated that netting back would yield $.50-$1.00 at the wellhead in Algeria. The Panhandle volumes could reach 450 MMcf/d.

Distrigas, who imports LNG into Boston, Massachusetts, has petitioned U.S. regulators for authority to provide flexible LNG sales at market prices to existing and new customers. Distrigas resumed Algerian imports in 1988 and is paying as little as $2.00/MMBtu, CIF, down from $2.50 for three cargoes received earlier in the year. Taking into account transport costs, Algeria is receiving $1.20-$1.50/MMBtu. Under the new contract, Distrigas would lift gas at negotiated prices responsive to market conditions. Under the revenue sharing provisions intended to increase sales to new customers, Distrigas will keep 30% of revenues and remit the rest to the marketing arm of Sonatrach. Instead of take-or-pay, the contract calls for up to 17 cargoes annually (approximately 2.7 bcf each) over a 15-year period which would average about 125 MMcf/d. However, there would be a charge for cargoes not taken of $2 million each to handle ship layup costs.

Other U.S. Imports

The Cove Point, Maryland LNG facility has not been used since Algerian exports were suspended in the late '70s. Recently, Shell outbid Norway and other potential U.S. importers of LNG in acquiring 50% of the stock of the subsidiary of the company (Columbia Gas) owning the facility, providing certain significant conditions are met. As part of the agreement, Shell and Columbia Gas could import LNG as early as winter 1991-1992. Shell's interest is at least partly attributable to their looking for a market outlet besides Europe for their Bonny LNG to come onstream in 1995.

Reflecting optimism in the future U.S. market, Exxon Imperial Oil and Shell have applied for Canadian licenses to export Arctic Gas to the U.S. beginning as early as 1996. Extensive new pipeline systems would be needed to transport the gas to existing systems.

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