

Appendix B International Comparisons

A. Comparison of Southern Africa's gas chain to mature industries in Europe and North America

Pipeline gas supplies enter Europe mainly from the North Sea, Algeria, and Russia. Three countries, the U.K., Netherlands, and Norway, have major jurisdiction over North Sea natural gas production. Each of these national sectors has a complex array of private companies which undertake the exploration and production of the gas. Companies proposing to develop new fields and pipelines to serve them actively compete with other North Sea producers and large gas suppliers from Russia and Algeria. No one country or company controls a sufficient quantity of gas production to dictate supply, price, and terms.

Europe's natural gas transmission pipelines are still developing. Almost without exception they were built on the condition that they were to enjoy an exclusive franchise for both the transportation and merchant function. There is little competition and delivered prices are set on the basis of a fuel-price parity formula.

The gas market in the United States and Canada is competitive. In the U.S. no gas producer controls more than 10% of total production.¹ The eight largest natural gas producers control less than one-third of production, and there are hundreds of independent producers. In addition, there is a futures market for natural gas, which allows anyone to contract for future deliveries in open bidding.²

¹ American Petroleum Institute (API), *Market Shares and Individual Company Data for U.S. Energy markets: 1950-1985*, Discussion Paper #014R, October, 1986.

² Prices in the New York Mercantile's natural gas market are based at Henry Hub, Louisiana.

Pipeline transmission in North America has become increasingly competitive during the last decade. The transportation and merchant functions of the major interstate pipelines have been separated. Industrial customers and gas distribution utilities are now allowed to buy directly from gas producers and arrange separately for gas transport. This policy change is known broadly as "open access." It is workable in the United States, in part, because natural gas pipeline transmission is now a mature industry; routes are frequently duplicated and there is competition between pipelines.

The U.S. has terminated gas price regulation at the wellhead. It is generally recognized that this regulation is not necessary because the market is so competitive. Ironically, the previous system of interstate gas price regulations administered by the Federal Energy Regulatory (FERC) actually caused much higher prices for consumers than the present system of light-handed regulation.³

B. History of the development of several mature gas industries: the United States, Canada, Germany, and France

1. United States

In the U.S., companies were induced to build natural gas transmission and distribution systems by the promise of an exclusive franchise in the areas they were to serve. The right was usually granted by a local or state government for local distribution companies and the federal government for interstate pipelines. Due to the size of the investment, companies wanted protection from cut-throat competition. They also needed access to city streets and other publicly owned rights-of-way.

The emergence of a natural gas industry in the United States began with the sale of synthetic gas into small urban distribution networks in the Northeast, the West and the Midwest. Small natural gas systems usually served communities

³ Natural gas average wellhead prices peaked at \$2.64 per mcf in 1984. In the first half of 1995, they averaged \$1.57. Average industrial prices in 1984 were \$4.22 per mcf and averaged \$2.71 in the first half of 1995.

close to the wellhead. The gas was used primarily for lighting until the late 1800's when it was replaced by electricity. After that, natural gas demand was for commercial space and water heating. Only later was demand extended to residential users.

Companies providing synthetic gas for lighting into urban areas petitioned regulators for franchises and for eminent domain. In 1907, New York and Wisconsin were the first States to establish public utility commissions (PUC). The granting of the franchise gave the utility a monopoly in its service region. The PUC's role was to protect the public interest. Decisions to build new facilities and to set gas tariffs all needed the approval of the commission. Jurisdiction over gas distribution rests with state governments. The states vary widely in the degree to which rate-making powers are delegated to municipalities.

Federal regulation of the natural gas industry did not exist until the Natural Gas Act of 1938, when Congress authorized the Federal Power Commission to regulate interstate gas transmission. Until that time, interstate regulation was unnecessary because pipelines could only move gas 50 to 100 miles.

The technological advances in pipeline construction which occurred in the 1920's was the motivating force behind the long-distance pipeline building boom of the 1920's. Between 1927 and 1931, a dozen major transmission systems emerged, each with pipelines exceeding 200 miles in length. They included: Northern Natural Gas Company, Panhandle Eastern Pipeline Company, Cities Service Gas Company (now Northwest Central Gas Company), Colorado Interstate Gas Company, Southern Natural Gas Company, Pacific Gas and Electric Company and El Paso Natural Gas Company.⁴

There was a lull in pipeline construction during the great depression. However, World War II stimulated energy consumption. Submarine warfare created a fuel crises and highlighted the necessity for a reliable overland route for energy resources. The Tennessee Gas Transmission Company was granted

⁴ Arlon R. Tussing and Connie C. Barlow, *The Natural Gas Industry*, 1984.

special privileges to build a natural gas pipeline linking the Gulf Coast to the Appalachian region. A major purpose of the line was to move gas, a cheap fuel that would otherwise be flared, from Texas to Oak Ridge, Tennessee, to enrich uranium for use in atomic bombs.

2. Canada

Originally transmission pipelines in Canada were designed to export natural gas discoveries in Alberta and British Columbia to the United States. But, with the energy crisis of 1973-74, Canadian energy policy focused on national security. Fuel shortages and high oil prices exacerbated the split between Quebec and English-speaking provinces.

Three western provinces supply Canada with its natural gas, Alberta produces 82%, British Columbia 12% and Saskatchewan 6%. There are at least 1,000 producers of natural gas, varying in size from international companies to one-well operations.

Pipeline companies can be classified into two categories. First, there are provincial companies such as Westcoast Energy in British Columbia, NOVA Corp in Alberta and TransGas in Saskatchewan. Second, there are federally regulated pipelines that export natural gas and engage in interprovincial transportation of gas. They are TransCanada Pipeline, Alberta Natural Gas, Foothills and Westcoast.

Distribution of natural gas takes place through local distribution companies (LDC) which are privately owned and regulated on a cost of service basis. The transmission system in Canada is highly interconnected with that of the United States. Roughly half of Canada's production is exported to the U.S.

3. Germany

Germany has a unique role in Europe due to its pivotal geographical position. It imports gas from three of the four major continental European suppliers of gas: the Netherlands, Norway and the Soviet Union. Transit pipelines connecting producers and consumers criss-cross the country. The

pipelines include Megal (Czech Republic to France), TENP (Netherlands to Switzerland) and Midal/Stegal (North Sea to Czech Republic).

The European natural gas market was in decline due to a lack of indigenous supply when, in 1959, a huge natural gas field was discovered in the Groningen Province of the Netherlands. By 1963, small quantities of the Dutch gas began to be exported to West Germany. During the early and mid 1960's a series of export deals were concluded between the Dutch gas export organization NAM/Gas Export, and buyers in Belgium, France and West Germany. These long term contracts created a need for the necessary volumes of gas to justify an expensive, new gas transmission pipeline system. Later, in the second half of the 1960's and early 1970's further export contracts were concluded with West German, Swiss and Italian gas interests and again the transmission pipeline system was enlarged. Most of the gas export contracts were at fixed border prices with life spans of twenty to twenty-five years.

Ruhrgas is the dominant firm in the German market with full or partial ownership of most major transmission lines as well as being a major importer. Ruhrgas itself is owned by a diverse set of investors, including international oil companies (which also produce gas indigenously), a coal company, and German industrial companies. Wingas, another importer as well as a transmission company, is a joint venture between Wintershall, a subsidiary of chemical company BASF, and the Russian Gazprom. Long a major producer of German gas selling mainly to BASF, Wingas has recently entered the transmission business in its own right, building the Midal/Stegal system. Wintershall pipelines were funded through the joint venture company's own resources, although the pipelines are open to access by third parties.

Germany, along with Sweden and Switzerland, are notable exceptions to the European model of tight regulation and state control of the natural gas industry. Germany does not regulate any stage of the industry operations including production at the wellhead, transmission, and distribution to the consumer/end user. In addition, the government has made no effort to control the structure of tariffs charged to gas consumers. Local distribution companies in Germany number about 500 and most are owned and operated in whole or in part by local authorities and/or districts.

The major trunk pipeline system that crosses Germany is the result of international cooperation in gas transmission. Trans Europa Naturgas Pipeline (TENP) is jointly owned by SNAM of Italy and Ruhrgas of Germany and supplies Dutch gas to Italy and Switzerland. Meanwhile, Ruhrgas, Gaz de France and OMV of Austria each own part of the Mittel Europaische Gasleitungsgesellschaft (MEGAL) which connects Czechoslovakia with France and Germany to supply Russian gas to these countries. Producing companies, such as Shell and Esso, also have interests in trunk pipelines in Germany. These major national and multinational oil companies were involved in setting up natural gas marketing on a national scale in many European countries. In Europe, long term contracts for gas purchases and transmission guarantee some pipeline companies access to part of any reserves discovered and developed by producers. Continental European transmission companies sometimes form a consortium to conduct negotiations for international purchases. Cooperation in consortium arrangements provides an important means of ensuring close contact among transmission companies as well as between transmission companies and their suppliers. Private law contracts and informal relationships play a very important role, not only in the supply of gas but also in establishing the framework in which industry cooperation takes place. This may explain the less regulated framework of the European gas industry when compared to that of the United States.⁵

4. France

The major French natural gas transmission lines were first built to move Groningen gas from the Netherlands to Northern France. French gas transmission is dominated by state owned Gaz de France(GDF) which also has a monopoly for importing gas. Two other regional companies, Gaz du Sud-Ouest (GSO) and Compagnie Francaise de Methane (CFM), are each partially owned by GDF, Elf Aquitaine, and CFM also by Total. GSO operates its own transportation system in southwestern France and sells to local distributors and directly to industrial customers. CFM does not have its own transmission system but leases line space from GDF. It sells directly to industrial

⁵ IEA, *Natural Gas Prospects*, 1986.

customers and to local distributors. Imports coming from Russia, Algeria, Norway and the Netherlands which together make up 98% of France's consumption. The major firms are granted concessions by the state for a period of 30 years and must be at least 30% owned by the state.