

PUBLIC POLICY FOR THE

Private sector

Note No. 176

April 1999

Ada Karina
Izaguirre

Private Participation in the Transmission and Distribution of Natural Gas—Recent Trends

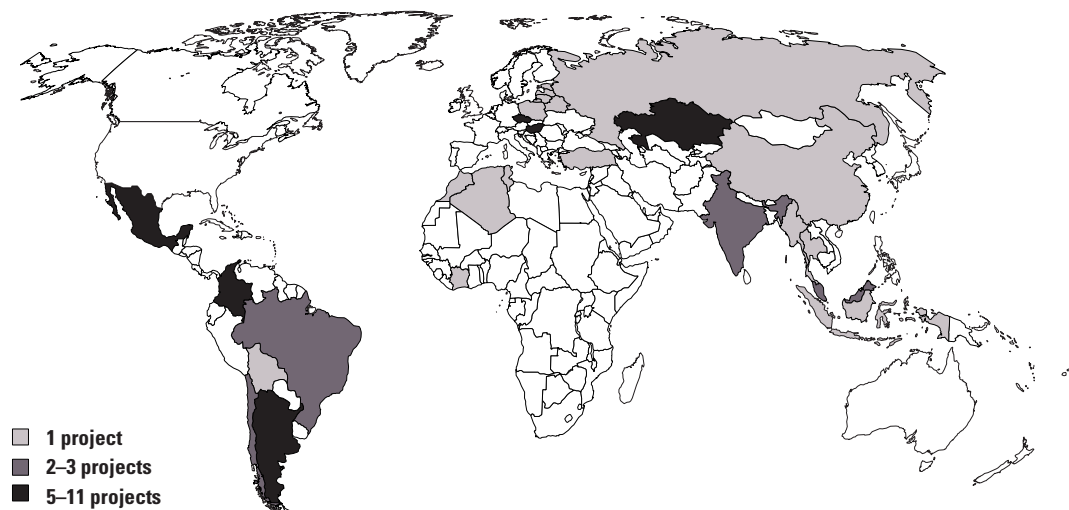
The World Bank's Private Participation in Infrastructure (PPI) Project Database covers private participation in infrastructure in developing countries. The database compiles information on privately owned or managed electricity, telecommunications, transport, water, and natural gas transmission and distribution projects. This Note focuses on the natural gas projects that reached financial closure between 1990 and 1997, surveying regional trends in and types of private participation.

The 1990s have seen a significant increase in private participation in the transmission and distribution (transport) of natural gas in developing countries. Until 1990 private participation in the construction and ownership of natural gas transport facilities in these countries was limited to a few isolated cases. The increasing participation of the private sector in gas transport has resulted mainly from a growing demand for new gas transport facilities coinciding with a growing consensus in favor of private participation in infrastructure. The increasing demand for gas transport facilities has been driven by the strong growth in energy demand, discoveries of important natural gas fields, and concerns about the environment. Private involvement in the con-

struction or ownership of gas transport infrastructure has been prompted not only by the acceptance of private participation in infrastructure, but also by public sector budget constraints.

Between 1990 and 1997 twenty-six developing countries introduced private participation in the transmission and distribution of natural gas (figure 1). This Note, which draws on the World Bank's PPI Project Database, provides an overview of the patterns and trends in the projects in these countries. The database covers only projects that transport natural gas to end users; captive pipelines owned by private upstream gas producers and condensate operations are not

FIGURE 1 DEVELOPING COUNTRIES WITH TRANSMISSION AND DISTRIBUTION PROJECTS WITH PRIVATE PARTICIPATION, 1990–97



Source: PPI Project Database.



BOX 1 PPI PROJECT DATABASE: PROJECT CRITERIA AND DATABASE TERMINOLOGY*Database coverage*

- To be included, a project must have reached financial closure and directly or indirectly serve the general public.
- The sectors covered are electricity, natural gas, telecommunications, transport, and water.
- The period covered is 1984–97.
- The natural gas sector includes two segments: transmission and distribution. The database excludes liquefied natural gas plants, movable assets, incinerators, stand-alone solid waste projects, and small projects such as windmills.
- The database covers developing countries, as defined and classified by the World Bank, in East Asia and the Pacific, Europe and Central Asia, Latin America and the Caribbean, the Middle East and North Africa, South Asia, and Sub-Saharan Africa.

Definition of private participation. The private company must assume operating risk during the operating period or assume development and operating risk during the contract period. In addition, the operator must consist of one or more corporate entities with significant private equity participation that are separate from any government agency.

Definition of a project unit. A corporate entity created to operate infrastructure facilities is considered a project. When two or more physical facilities are operated by the same corporate entity, all are considered as one project.

Project types

- *Divestitures.* A private consortium buys an equity stake in a state-owned enterprise. The private stake may or may not imply private management of the company.
- *Greenfield projects.* A private entity or a public-private joint venture build and operate a new facility. This category includes build-own-transfer and build-own-operate contracts as well as merchant power plants.

- *Operations and management contracts.* The private entity takes over the management of a state-owned enterprise for a given period. This category includes management contracts and leases.
- *Operations and management contracts with major capital expenditure.* A private consortium takes over the management of a state-owned enterprise for a given period during which the private entity also assumes significant investment risk. This category includes build-transfer-operate, build-lease-transfer, and build-rehabilitate-operate-transfer contracts as applied to existing facilities.

Definition of financial closure. For greenfield projects and for operations and management contracts with major capital expenditure, financial closure is defined as the existence of a legally binding commitment of equity holders or debt financiers to provide or mobilize funding for the project. The funding must account for a significant part of the project cost, securing the construction of the facility.

For operations and management contracts, there must be a lease agreement or a contract authorizing the commencement of management or lease service. For divestitures, the equity holders must have a legally binding commitment to acquire the assets of the facility.

Sources

- World Wide Web
- Commercial databases
- Specialized publications
- Developers and sponsors
- Regulatory agencies

Contact

The database is maintained by the World Bank's Private Participation in Infrastructure Group. For more information contact Mina Salehi at 202 473 7157 or msalehi@worldbank.org.

included (box 1). The form of private participation varies—ranging from greenfield projects to export natural gas from Algeria to Europe or to create a natural gas distribution market in Mexico to the privatization of existing assets in Argentina and Hungary. During 1990–97 the private sector took on the operations or construction risk of seventy-seven natural gas transport projects, with investments totaling US\$18.9 billion (figures 2 and 3).¹

The diverse development levels of the natural gas sector in developing countries raise policy issues for private participation that are quite different from those in other infrastructure sectors. Except for countries in Europe and Central Asia and a few in Asia and Latin America, most developing countries have limited or no gas resources or transport facilities (figures 1 and 4). Some countries have promoted private involvement in existing facilities, while others have relied on the private sector to establish new gas networks. A third group of countries has no gas network—public or private.

Although private participation in natural gas transport projects has increased significantly in recent years, it remains limited. Still, four trends are evident:

- Divestitures and greenfield projects are more common than operations and management contracts.
- Stand-alone transmission and distribution projects are more common than integrated (transmission, distribution, and sometimes production) projects.
- Export-oriented projects are starting to emerge.
- Projects are concentrated in certain regions and countries.

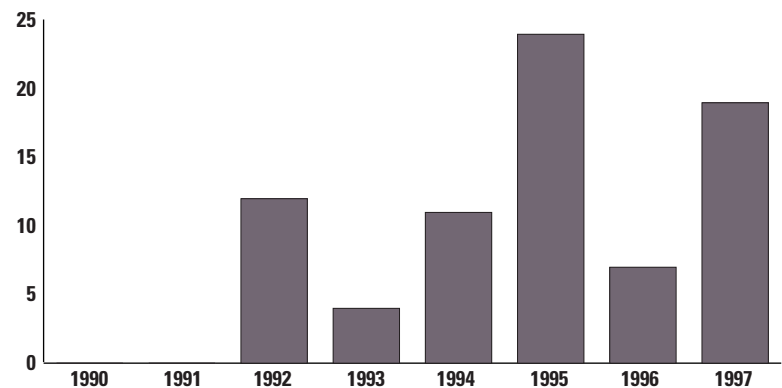
Divestitures and greenfield projects dominate

Of the total investment in private gas transport projects, about 56 percent has gone to the forty-eight divestitures and 40 percent has gone to the twenty-seven greenfield projects (figure 5). As might be expected, divestitures have occurred in countries with well-developed pipeline net-

works, while greenfield projects have occurred mainly in countries with little or no transport infrastructure for natural gas.

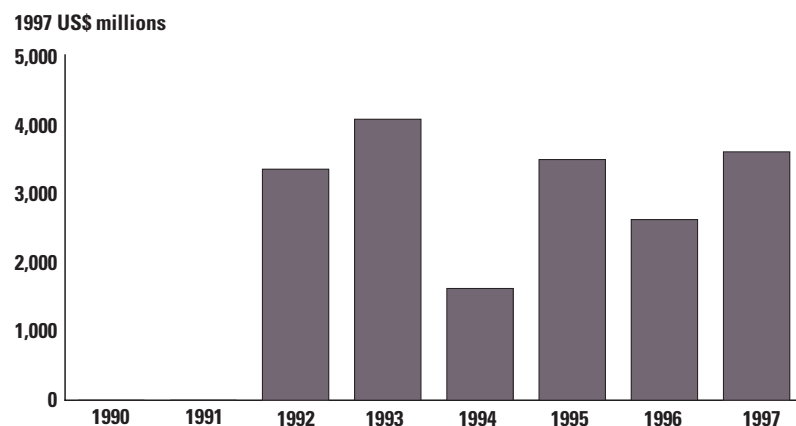
Operations and management contracts with significant capital expenditure have been rare in gas transport facilities, particularly relative to the water sector.² By 1997 only two operations and management contracts involving significant capital expenditure had been signed. One was for the

FIGURE 2 NATURAL GAS TRANSPORT PROJECTS WITH PRIVATE PARTICIPATION IN DEVELOPING COUNTRIES, 1990–97



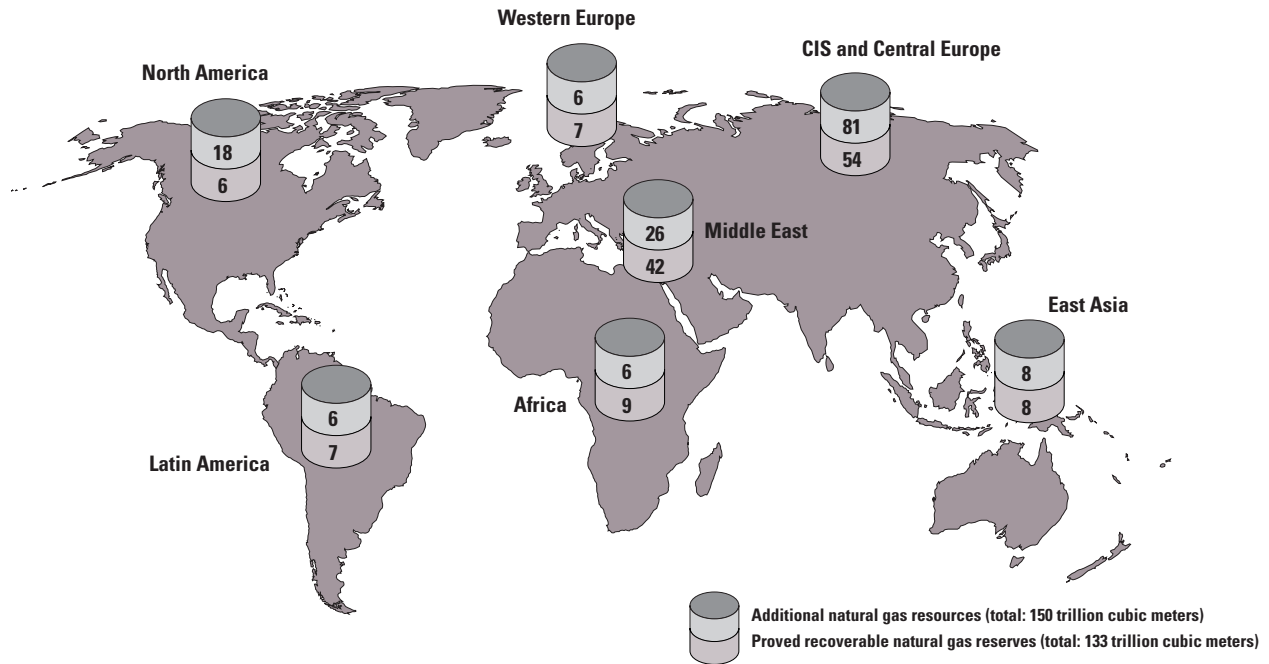
Source: PPI Project Database.

FIGURE 3 INVESTMENT IN PRIVATE NATURAL GAS TRANSPORT PROJECTS IN DEVELOPING COUNTRIES, 1990–97



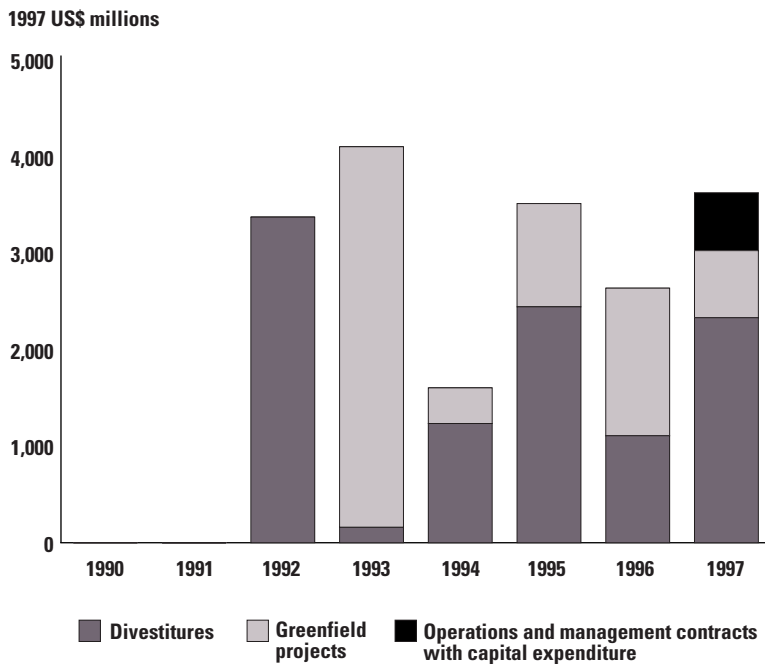
Source: PPI Project Database.

FIGURE 4 WORLD GAS RESOURCES
Trillions of cubic meters



Note: CIS is Commonwealth of Independent States.
Source: Ruhrgas.

FIGURE 5 INVESTMENT IN PRIVATE NATURAL GAS TRANSPORT PROJECTS IN DEVELOPING COUNTRIES BY TYPE OF PROJECT, 1990–97



Source: PPI Project Database.

rehabilitation and operation of the natural gas transmission system in Kazakhstan. The other was for the expansion and operation of a small distribution system in Turkey. Operations and management contracts (without capital expenditure) and lease contracts have not featured as a form of private participation in the natural gas sector.

Investments focus on stand-alone projects

Most private investment in gas transport projects has been concentrated in vertically deintegrated facilities. Of the total invested, 64 percent has been captured by the twenty-two projects involving the operation or construction of transmission facilities (figure 6 and table 1). Most of these projects have been in Latin America and the Caribbean (twelve projects). Stand-alone distribution facilities, in turn, have been concentrated in Europe and Central Asia (twenty-five) and Latin America and the Caribbean (twenty-one). The predominance of stand-alone projects might be explained by increasing attempts by government to create more competitive markets for natural gas supply, building on experiences in the United Kingdom and the United States.

There have been just five integrated-utility gas projects involving private participation, and most have been in Europe and Central Asia (Latvias Gaze in Latvia, Eesti Gas in Estonia, Lietuvos Dujo in Lithuania, Gazprom in the Russian Federation, and Petronas Gas in Malaysia). Private involvement in these projects has fallen short of full private ownership.

Export-oriented pipelines emerge

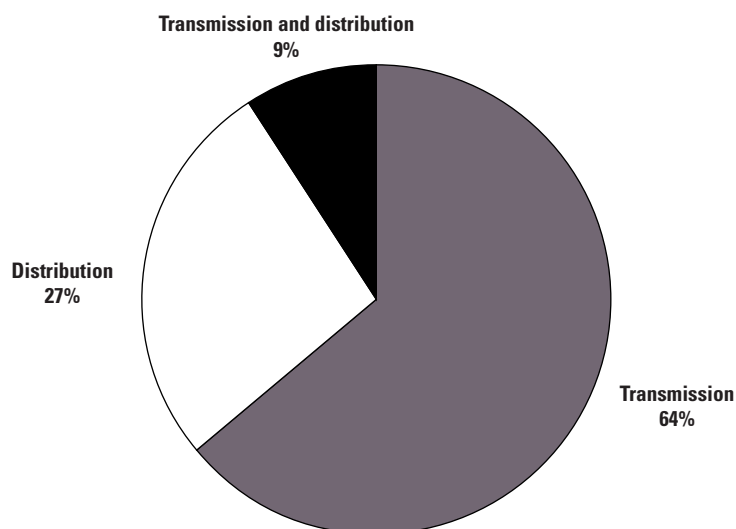
Another feature of the private participation in natural gas has been the implementation of large export-oriented pipeline projects. The natural gas industry requires access to gas fields, which may or may not exist in a country. Thus the development or expansion of a domestic gas industry has required international gas trade. Five private pipeline projects of this type, representing total investment of US\$4 billion, reached financial closure between 1990 and 1997: the Yadana gas pipeline from Myanmar to Thailand, the Maghreb gas pipeline from Algeria to Europe, the Gas-Andes pipeline from Argentina to Chile, and the sections of the Yamal gas pipeline in Belarus and Poland. Among those projects, the Argentine-Chilean gas pipeline was the first to introduce natural gas into a country (Chile). The project, developed by a fully private consortium, is part of a business plan to develop Chile's natural gas industry.

More cross-border projects are expected to be implemented in the next few years. In addition to the Bolivia-Brazil pipeline now close to completion, there are plans for international transmission pipelines in most regions.³ Examples include proposals to develop pipelines from Turkmenistan to Turkey, from Indonesia to Singapore, from Bangladesh and Oman to India, from Argentina to Chile and Uruguay, and from Egypt to Israel and other countries in the Middle East.

Investments reflect a regional and national concentration

Investment in private natural gas transport projects is concentrated in Latin America and the Caribbean. Thirty-three projects have reached

FIGURE 6 INVESTMENT IN PRIVATE NATURAL GAS TRANSPORT PROJECTS IN DEVELOPING COUNTRIES BY SEGMENT, 1990–97



Source: PPI Project Database.

TABLE 1 PRIVATE NATURAL GAS TRANSPORT PROJECTS IN DEVELOPING COUNTRIES BY SEGMENT, 1990–97

Segment	Number of projects	Total investment in projects with private participation (1997 US\$ millions)
Distribution	50	5,013
Transmission	22	12,102
Transmission and distribution	5	1,762
Total	77	18,876

Source: PPI Project Database.

financial closure in the region, mobilizing investments of US\$9.3 billion, or 49 percent of the total investment in private projects in the sector between 1990 and 1997 (table 2). Countries in Europe and Central Asia have also been active in opening their natural gas utilities to the private sector, awarding thirty-three projects representing total investment of US\$3 billion during the same period. Private sector activity in other regions has been limited to a few projects.

As in the electricity and water sectors, a few countries capture most projects and investments.⁴ The

TABLE 2 PRIVATE NATURAL GAS TRANSPORT PROJECTS IN DEVELOPING COUNTRIES BY REGION, 1990–97

Region	Total investment in projects with private participation (1997 US\$ millions)	Number of projects
East Asia and the Pacific	3,131	5
Europe and Central Asia	3,087	33
Latin America and the Caribbean	9,274	33
Middle East and North Africa	3,271	2
South Asia	75	3
Sub-Saharan Africa	40	1
Total	18,878	77

Source: PPI Project Database.

top five countries ranked by investment in projects involving private participation accounted for 33 percent of all projects and almost 67 percent of total investment in 1990–97 (table 3). Among those five countries, two (Argentina and Algeria) captured about half of the total investment in the sector. The list of top five countries changes significantly when the countries are ranked by number of projects, although the high concentration of projects in a few countries remains (table 4). These changes in ranking can be partly explained by divestiture approaches taken by the Czech Republic and Kazakhstan, which privatized their natural gas utilities through mass (voucher) privatization schemes.

A breakdown of investment by project reveals a similarly high concentration of resources in few projects. The top five projects accounted for more than 40 percent of total investment in the sector in 1990–97 (table 5). Three of these projects were in Argentina, representing around 37 percent of the investment in divestitures. The Maghreb gas pipeline from Algeria to Europe, in turn, accounted for 45 percent of the investment in greenfield projects.

Latin America and the Caribbean

The private sector has been involved in the transportation of natural gas in the six Latin

American countries (Argentina, Bolivia, Brazil, Chile, Colombia, and Mexico) that have developed a local gas industry. In most of these countries private participation in natural gas projects has been part of broader sector reform that has usually included the establishment of new regulatory frameworks and the vertical separation of the sector into its three basic business units (production, transmission, and distribution). New legal frameworks in these countries have also required mandatory open access to pipelines for third parties in order to promote competition in natural gas markets. Argentina and Chile have been the most market-oriented reformers in the region, creating competitive market structures, transferring investment decisions to the market, and allowing full private ownership of transmission and distribution assets.

Most natural gas reforms in Latin America have also been a component of broader energy reforms. Six of the seven countries started to reform their natural gas sectors at the same time that they were liberalizing their electricity sectors.

Latin American countries have chosen different forms of private participation depending on the initial development of their natural gas facilities. Countries with a fully developed network, like Argentina, or with main transportation assets, like Bolivia and Brazil, have opted for divestitures. Fifteen of the seventeen divestitures in the region are located in these three countries. Other countries with limited or no transportation networks—such as Chile, Colombia, and Mexico—have focused on constructing facilities through greenfield projects. The fifteen greenfield projects in the region are all in these three countries. More projects are expected in these countries, and in others such as Uruguay and Peru, as the private sector leads the drive to make natural gas available to all major urban centers.

Europe and Central Asia

Private participation in natural gas transport in Europe and Central Asia has focused on the privatization of existing assets. Of the thirty-three

private gas transport projects in the region, twenty-nine have been divestitures, accounting for 59 percent of the investment in the region. The privatization mechanism has differed across countries. Hungary sold controlling stakes to private consortia, reflecting the priority it puts on improving the efficiency and reliability of existing assets. The Czech Republic, Kazakhstan, and the Russian Federation opted for mass privatization programs. And Estonia, Latvia, and Lithuania privatized their natural gas companies by creating joint ventures with Gazprom, Russia's partially privatized and vertically integrated natural gas company.

Although private participation in natural gas activities has increased significantly in the region, the new investment that has come with divestitures has been minimal. The main reasons appear to be low retail natural gas tariffs, which have impaired the financial viability of natural gas utilities, and underdeveloped legal and regulatory frameworks.⁵

East Asia and the Pacific

East Asian countries can be considered in two groups. The first group comprises countries with existing gas transport facilities, such as the Republic of Korea, Malaysia, and Thailand. In these countries (except Korea) natural gas transmission and distribution is still a business reserved for the public sector.⁶ This situation mirrors that in these countries' electricity sectors, which remain dominated by state-owned enterprises. The second group comprises countries with limited or no gas transport facilities, such as China, Indonesia, and the Philippines.

Private participation in the region has been restricted to a few greenfield projects, mainly for the construction of new transmission pipelines (three projects) and one small distribution system. The only divestiture, which was partial, took place in Malaysia and took the form of a public offering aimed at raising funds rather than transferring control to the private sector. This situation is expected to change as privatization proposals in Korea and greenfield

TABLE 3 TOP FIVE DEVELOPING COUNTRIES BY INVESTMENT IN PRIVATE NATURAL GAS TRANSPORT PROJECTS, 1990–97

Country	Total investment in projects with private participation (1997 US\$ millions)	Number of projects
Argentina	6,284	10
Algeria	2,570	1
Malaysia	1,436	2
Hungary	1,324	7
Colombia	938	5
Total	12,551	25

Source: PPI Project Database.

TABLE 4 TOP FIVE DEVELOPING COUNTRIES BY NUMBER OF PRIVATE NATURAL GAS TRANSPORT PROJECTS, 1990–97

Country	Number of projects	Total investment in projects with private participation (1997 US\$ millions)
Argentina	11	6,284
Kazakhstan	11	^a
Mexico	10	604
Czech Republic	8	^a
Hungary	7	1,324
Total	47	8,211

a. Both countries privatized their gas utilities through mass privatization, so there is no divestiture revenue.

Source: PPI Project Database.

projects in Indonesia and the Philippines are implemented.

South Asia

Private participation in South Asia has been limited to three small greenfield projects to develop or expand distribution facilities in India. But if

TABLE 5 TOP FIVE PRIVATE NATURAL GAS TRANSPORT PROJECTS IN DEVELOPING COUNTRIES, 1990–97

Project	Country	Total investment (1997 US\$ millions)
Maghreb Gas pipeline from Algeria to Europe	Algeria/ Morocco	2,556
Transportadora de Gas del Sur	Argentina	1,939
Petronas Gas Sdn Bhd	Malaysia	1,265
Transportadora de Gas del Norte	Argentina	1,070
Distribudora de Gas Metropolitana	Argentina	969
Total		7,798

Source: PPI Project Database.

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recent proposals to privatize natural gas facilities in India and to build cross-border greenfield transmission pipelines from Bangladesh or Oman to India are implemented, there should be a significant increase in private participation in the region over the next few years.

Middle East and North Africa

Private participation in natural gas in the Middle East and North Africa has focused on one export-oriented greenfield project (the Maghreb gas pipeline in Algeria) and one domestic pipeline (Tunisia). But private participation in the region should increase over the next few years if projects awarded in Egypt to provide natural gas to areas with no supply and other export-oriented pipeline proposals are implemented.

Sub-Saharan Africa

Private participation in natural gas in Sub-Saharan Africa has been limited to one greenfield project, the CI-11 gas pipeline in Côte d'Ivoire. There is also a proposal for the Nigerian government and Chevron to build a West African gas pipeline. The limited activity in the region is explained mainly by the lack of gas reserves and the limited transport infrastructure in the region (except in South Africa). Small domestic markets in most countries have also limited the development of gas distribution infrastructure.

Conclusion

Private participation in the transmission and distribution of natural gas has increased significantly in recent years and should continue to expand. Experiences in Argentina and Chile show that the private sector can play the leading role in developing or expanding the natural gas industry. As in other infrastructure sectors, the key role for the government is to establish an appropriate enabling environment, including well-defined policies and a sound regulatory framework. The growth in privately financed and operated export projects promises to bring the economic and environmental benefits of natural gas to a larger number of countries.

- ¹ All dollar amounts are in 1997 U.S. dollars. The PPI Project Database records total investment, not private investment alone, in infrastructure projects involving private participation. There were no natural gas projects involving private participation in developing countries in 1990 and 1991.
- ² See Gisele Silva, Nicola Tynan, and Yesin Yilmaz, "Private Participation in the Water and Sewerage Sector—Recent Trends" (Viewpoint 147, August 1998).
- ³ See Peter L. Law and Nelson de Franco, "International Gas Trade—The Bolivia-Brazil Gas Pipeline" (Viewpoint 144, May 1998).
- ⁴ See Gisele Silva, Nicola Tynan, and Yesin Yilmaz, "Private Participation in the Water and Sewerage Sector—Recent Trends" (Viewpoint 147, August 1998), and Ada Karina Izaguirre, "Private Participation in the Electricity Sector" (Viewpoint 154, September 1998).
- ⁵ For a discussion on the status of natural gas reform in Europe and Central Asia see Economic Commission for Europe, "Restructuring of the Gas Industry in Transition Countries" (1998).
- ⁶ Most natural gas distribution facilities in Korea are owned by long-established investor-owned utilities.

Ada Karina Izaguirre (aizaguirre@worldbank.org), Consultant, Private Participation in Infrastructure Group