

PUBLIC POLICY FOR THE

# Private sector

Note No. 154

September 1998

Ada Karina Izaguirre

## Private Participation in the Electricity Sector—Recent Trends

The PPI Project Database covers private participation in infrastructure in developing countries. The database records details of all projects owned or managed by private companies in 1984–97 in the water, transport, electricity, telecommunications, and natural gas transmission and distribution sectors. This Note focuses on private electricity projects that reached financial closure between 1990 and 1997, surveying regional trends and types of private participation. See box 1 for an explanation of the PPI project criteria and database terminology.

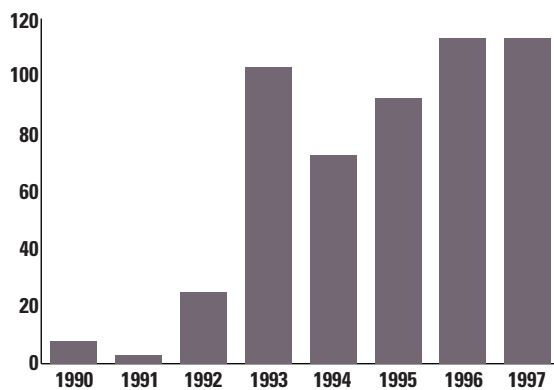
Over the past decade a growing number of developing countries have opened their electricity industries to the private sector. The new wave of policy reforms designed to promote private participation has been driven by three main forces: the need to expand the capacity or increase the reliability of systems, or both; public sector budget constraints; and the positive results of the early experiments with private participation in Chile and the United Kingdom. Between 1990 and 1997 sixty-two developing countries introduced private participation in the electricity sector to varying degrees—ranging from management contracts for the state-owned utility in Mali to the privatization of most sector operations in Argentina, Bolivia, and Hungary.

Before 1990 private participation in electricity in developing countries was limited to Chile (which introduced comprehensive reforms in

the 1980s to create a competitive private market) and a few isolated experiences in other countries. The investments in electricity projects with private participation amounted to US\$3.6 billion between 1984 and 1989.<sup>1</sup>

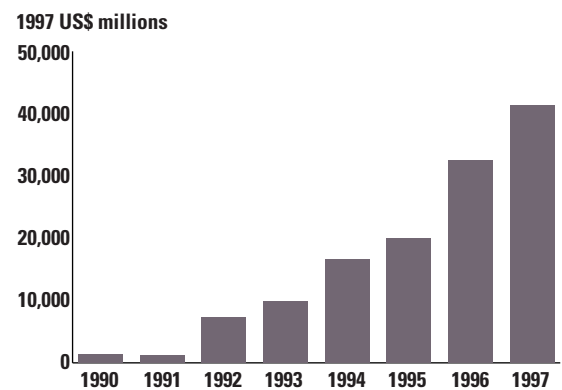
Private participation has grown substantially since 1990, with electricity becoming one of the leading infrastructure sectors in attracting private investment. Between 1990 and 1997 the private sector took on the management, operations, rehabilitation, or construction risk of 534 projects, with total investments of US\$131 billion (figures 1 and 2).<sup>2</sup> These projects have been implemented under schemes ranging from management contracts with or without investment commitments to divestitures to greenfield facilities under build-operate-own (BOO), build-operate-transfer (BOT), or similar arrangements. This Note provides an overview of the patterns and trends in these projects.

**FIGURE 1 ELECTRICITY PROJECTS WITH PRIVATE PARTICIPATION IN DEVELOPING COUNTRIES, 1990–97**



Source: PPI Project Database.

**FIGURE 2 INVESTMENTS IN PRIVATE ELECTRICITY PROJECTS IN DEVELOPING COUNTRIES, 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 water, transport, electricity, natural gas, and telecommunications.
- The following segments of the electricity sector are included: generation, transmission, and distribution.
- Moveable assets, incinerators, stand-alone solid waste projects, and small projects such as windmills are excluded.
- The period covered is 1984–97.
- The countries covered are 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 project.* 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 of them together are considered one project.

*Project types*

- **Management and operations contracts**—The private entity takes over the management of a state-owned enterprise for a given period. This category includes management contracts and leases.
- **Management and operations contracts with major capital expenditure**—A private consor-

tium 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.

- **Greenfield projects**—A private entity or a public-private joint venture builds and operates a new facility. This category includes build-operate-transfer and build-own-operate contracts as well as merchant power plants.
- **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.

*Definition of financial closure.* For greenfield projects and for management and operations contracts with significant private investment 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 management and operations contracts a lease agreement or a contract authorizing the commencement of management service must exist. For divestitures the equity holders must have a legally binding commitment to acquire the assets of the facility.

*Sources*

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

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

## Four major trends

The PPI Project Database shows strong, steady growth in private participation in electricity, whether measured in number of countries, number of projects, or value of investments. It also shows four main underlying trends:

- A regional and national concentration of projects.
- A higher concentration of investment in generation than in distribution and transmission.
- A dominance of greenfield projects and divestitures compared with management and operations contracts.
- Different regional approaches to private participation.

### Investments reflect a regional and national concentration

A regional breakdown of private electricity projects shows a concentration of projects in East Asia and the Pacific and Latin America and the Caribbean. This trend has also been noticeable in such sectors as water and transport. East Asian countries awarded 165 contracts, representing a total investment of about US\$50 billion, between 1990 and 1997 (table 1). In Latin America and the Caribbean 169 private electricity projects, representing a total investment of US\$45 billion, reached financial closure during the same period.

Although private participation in electricity has been spreading rapidly among developing countries, a few countries still capture most of the investment. The top ten countries ranked by investment in projects with private participation accounted for 58 percent of the projects and almost 76 percent of the total investment in 1990–97 (table 2). Two things should be noted in relation to the list of top ten countries by investment. First, China has taken a more cautious approach to private participation than any other top-ten country. Most of its projects have been developed as joint ventures between private sponsors and state-owned enterprises, with the Laibin B project the only one owned by a fully private consortium so far. In addi-

tion, the private stakes in Chinese projects have been inversely proportional to the size of the projects. Relatively big electricity projects have been developed by consortia in which the private sponsors own less than 50 percent of the equity, while in smaller projects the private stake may be up to 70 or 80 percent. Public-private joint ventures of this kind overstate the private involvement in electricity projects in China compared with other countries, where private electricity projects tend to be wholly or substantially privately owned. Second, although Chile has had significant investment in private electricity projects, it is not included in the list of top ten because much of the investment occurred in the 1980s.

The list of top ten countries changes substantially when the total investment in private electricity projects is expressed in per capita terms (table 3). Relatively small countries, such as Belize, Jamaica, and the Lao People's Democratic Republic, appear more active in private participation in electricity by this measure. Lao PDR is an unusual case. Its high per capita investment is explained mainly by its two ex-

**TABLE 1 PRIVATE ELECTRICITY PROJECTS IN DEVELOPING COUNTRIES, BY REGION, 1990–97**

Region	Projects	Total investment in projects with private participation (1997 US\$ millions)
<b>East Asia and the Pacific</b>	<b>165</b>	<b>49,741</b>
<b>Europe and Central Asia</b>	<b>112</b>	<b>10,436</b>
<b>Latin America and the Caribbean</b>	<b>169</b>	<b>45,311</b>
<b>Middle East and North Africa</b>	<b>10</b>	<b>6,721</b>
<b>South Asia</b>	<b>57</b>	<b>16,799</b>
<b>Sub-Saharan Africa</b>	<b>21</b>	<b>2,040</b>
<b>Total</b>	<b>534</b>	<b>131,048</b>

Source: PPI Project Database.

**TABLE 2 TOP TEN DEVELOPING COUNTRIES IN PRIVATE PARTICIPATION IN ELECTRICITY, BY TOTAL INVESTMENT, 1990–97**

Country	Total investment in projects with private participation (1997 US\$ millions)	Projects
Brazil	17,644	20
China	15,015	60
Argentina	12,011	63
Philippines	10,901	39
Indonesia	9,569	13
India	9,219	29
Pakistan	6,924	20
Malaysia	6,330	9
Colombia	5,873	16
Thailand	5,645	39
<b>Total</b>	<b>99,130</b>	<b>308</b>

Source: PPI Project Database.

**TABLE 3 TOP TEN DEVELOPING COUNTRIES IN PRIVATE PARTICIPATION IN ELECTRICITY, BY INVESTMENT PER CAPITA, 1990–97**

Country	Total investment in projects with private participation (1997 US\$ millions)	Investment per capita (1997 US\$)
Chile	5,000	347
Argentina	12,011	341
Malaysia	6,330	308
Belize	61	276
Hungary	2,091	205
Morocco	4,823	179
Colombia	5,873	157
Philippines	10,901	152
Jamaica	314	123
Lao PDR	552	117

Source: PPI Project Database.

port-oriented private electricity projects, the country's only private electricity projects to reach financial closure by 1997.

#### Investments focus on new generation

A striking characteristic of private participation in electricity has been the concentration of investments and projects in generation compared with transmission and distribution (figure 3). Of the total investment in private electricity projects in developing countries, 73 percent has been captured by the 377 projects that involve the construction of power generation plants (table 4). Most of these projects have been in East Asia and the Pacific, Latin America and the Caribbean, and South Asia. Most of the projects that involve stand-alone distribution businesses have been in Latin America and the Caribbean (thirty projects) and Europe and Central Asia (twenty). Integrated utilities with private participation have been mainly in Europe and Central Asia (sixty-three) and Latin America and the Caribbean (eleven). Only Latin America and the Caribbean has had stand-alone electricity transmission projects with private participation.

#### Greenfield projects and divestitures dominate

Another interesting feature of private participation in electricity has been the predominance of greenfield projects and divestitures (figure 4). Of the total investment in private electricity projects, about 56 percent has been directed to the 286 greenfield projects, and 40 percent to the 223 divestitures. Divestitures have been a more common route for introducing private participation in electricity than in the water sector, where privatizations have been rare (see Viewpoint 147).

Management and operations contracts have been rare in the electricity sector compared with the water sector. By 1997 twenty-five such contracts had been signed for electricity facilities. Of these, eighteen involved significant capital expenditure by private sponsors in expanding or rehabilitating the facilities. The other

seven were management or lease contracts, which transfer the management of generation or distribution facilities to the private sector while leaving the public sector primarily responsible for new investments.

### Regional approaches vary

The dominant type of private participation has varied among regions. Latin America and the Caribbean and Europe and Central Asia have favored divestitures, while Asia has shown a clear preference for greenfield projects. These patterns reflect country policy priorities.

**Latin America and the Caribbean.** Following the Chilean model, most Latin American countries have introduced private participation in electricity as part of broader reforms that usually include the establishment of a more competitive market structure. This approach has involved vertical separation of the electricity sector into three basic business units (generation, transmission, and distribution), transfer of at least generation and distribution to the private sector and establishment of new regulatory frameworks, and introduction of market mechanisms to encourage competition.<sup>3</sup> This strategy has been reflected in an emphasis on divestitures. Of the 169 private electricity projects in the region, 97 have been divestitures. These projects have accounted for 67 percent of the investment in privatized electricity companies in developing countries and 77 percent of the total investment in private electricity projects in the region (figures 5 and 6).

The dominance of divestitures in the region has prevailed across the segments of the sector. Argentina, Bolivia, Brazil, Chile, Colombia, and Peru have privatized significant distribution and generation facilities as stand-alone businesses. Argentina, Bolivia, and Chile have also privatized most transmission facilities, and Brazil and Colombia are planning to divest soon.

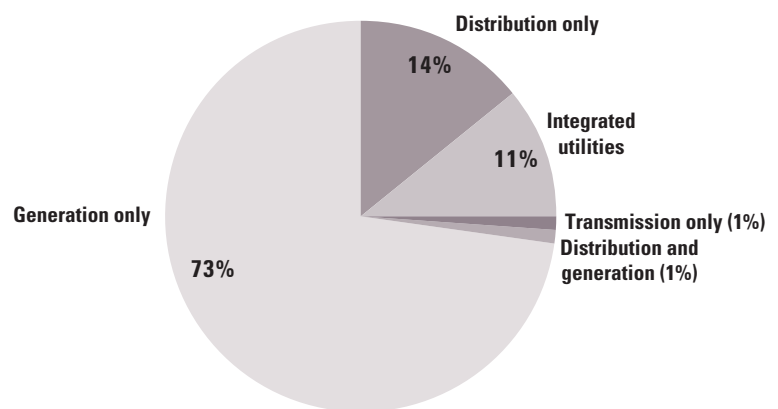
In this new business environment investments in private electricity projects have been driven mainly by market signals such as electricity

**TABLE 4 ELECTRICITY PROJECTS WITH PRIVATE PARTICIPATION IN DEVELOPING COUNTRIES, BY SEGMENT, 1990–97**

Segment	Projects
Distribution only	55
Transmission only	10
Generation only	377
Distribution and generation	6
Integrated utilities	86
<b>Total</b>	<b>534</b>

*Source: PPI Project Database.*

**FIGURE 3 INVESTMENTS IN PRIVATE ELECTRICITY PROJECTS IN DEVELOPING COUNTRIES, BY SEGMENT, 1990–97**



*Source: PPI Project Database.*

prices and demand growth. Of the US\$34 billion invested in divestitures in the region, more than US\$5.5 billion has been invested in expanding or rehabilitating the facilities of privatized companies. Of the seventy greenfield projects that reached financial closure in the region by 1997, twenty-nine were merchant power plants, with total investment of US\$5.4 billion. These investments have shown that private financing of power investment in competitive markets is feasible in a sound business environment.

The development of private power plants under BOT or BOO contracts has been less popular in

Latin America and the Caribbean than in Asia. Thirty-seven BOT or BOO contracts reached financial closure in the region by 1997, representing a total investment of US\$4.8 billion. Most of that investment was captured by eighteen projects in Colombia, Brazil, and Guatemala, countries that had already embarked on comprehensive reform of their electricity sectors. The other nineteen contracts were signed by Costa

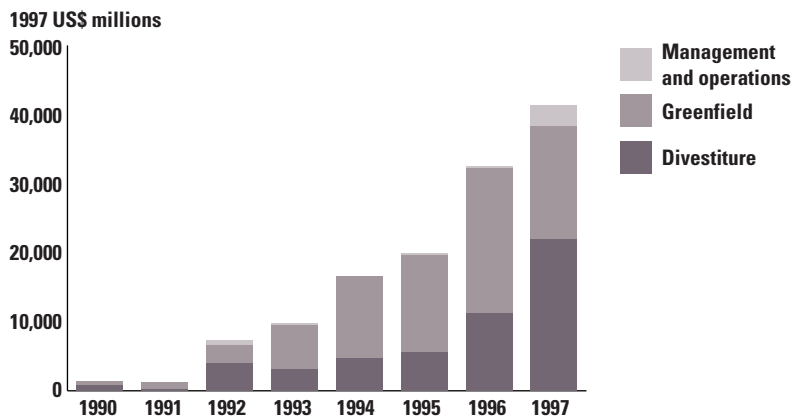
Rica, Jamaica, the Dominican Republic, and Honduras, which in most cases have adopted the Asian model of private participation.

**Europe and Central Asia.** Private participation in electricity in Europe and Central Asia has been concentrated in the Czech Republic, Hungary, Kazakhstan, the Russian Federation, and Turkey. Except in Turkey, the approach has been similar to that in Latin America—privatizing vertically disaggregated companies. This approach reflects a priority on improving the reliability and efficiency of existing assets rather than expanding capacity. Of 112 private electricity projects, 105 have been divestitures, accounting for 66 percent of the investment in the region. The privatization mechanism has differed across countries, however. Hungary and Kazakhstan have sold controlling stakes to private consortia, while the Czech Republic and Russia have opted for mass privatization programs.

The new investment that has come along with divestiture has been limited, with additional investments in privatized companies reaching only US\$2.7 billion by 1997. The main reason has been low retail tariffs, which have been inadequate to provide long-term funding for additional investment. Another reason has been the excess capacity in most of these countries. The same reasons explain why greenfield projects have been an exception in the region. Only seven greenfield projects, all under BOT or BOO arrangements, had reached financial closure by 1997; these projects accounted for investments totaling US\$3.5 billion. Five of these projects, representing a total investment of US\$3.2 billion, have been in Turkey.

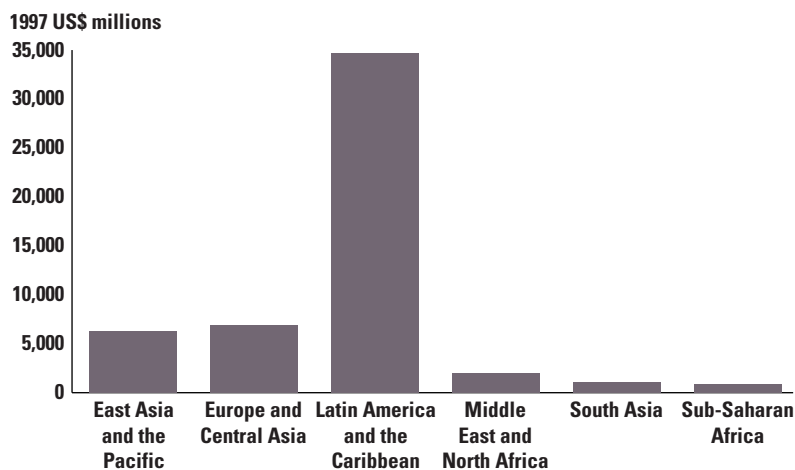
**Asia.** Asian countries have introduced private participation in electricity mainly through private financing of new generation capacity in the form of independent power producers. This approach reflects the priority given to expanding capacity to keep pace with expected demand growth and the slow progress in implementing deeper sectoral reforms. Of the 165 electricity projects reaching financial clo-

**FIGURE 4 INVESTMENT IN PRIVATE ELECTRICITY PROJECTS IN DEVELOPING COUNTRIES, BY TYPE OF PROJECT, 1990–97**



Source: PPI Project Database.

**FIGURE 5 INVESTMENT IN PRIVATIZED ELECTRICITY PROJECTS, BY REGION, 1990–97**



Source: PPI Project Database.

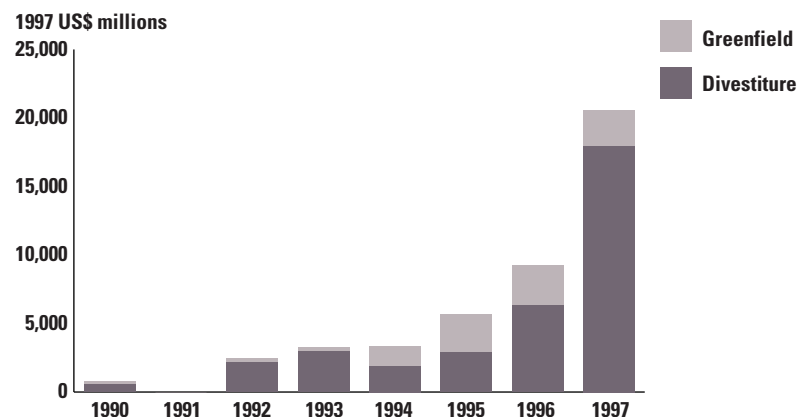
sure in East Asia and the Pacific by 1997, 139 involved the construction of new power generation plants. These projects accounted for 57 percent of total investment in private greenfield electricity projects in developing countries and 84 percent of the total investment in private electricity projects in the region (figures 7 and 8). In South Asia fifty-four of fifty-seven private electricity projects involved the construction of new power plants. These projects represented 21 percent of the total investment in greenfield projects and 93 percent of the total investment in private projects in the region.

The priority given to expanding generation capacity is also reflected in other forms of private participation pursued in East Asia and the Pacific. The eleven management and operations contracts signed in the region have involved investment commitments to rehabilitate existing generating facilities. Most of the fifteen partial divestitures in the region have been international public offerings of minority stakes in state-owned generating companies aimed at raising funds for the construction of new facilities, or negotiated sales of shares in small provincial generating plants.

Introducing private participation in generation without first—or at least simultaneously—undertaking deeper sectoral reforms is potentially problematic. In many cases this strategy has reduced pressures to implement cost-covering retail tariffs. Postponing tariff adjustments affects the creditworthiness of power off-takers and usually leads to demands for government guarantees of power purchase agreements, exposing taxpayers to substantial contingent liabilities. In most cases taxpayers are also left to bear the risk of misestimates of future demand for bulk power. Many of these problems have become dramatically apparent in the past year as the region has weathered a major macroeconomic crisis (see Viewpoint 146). The crisis will likely lead to a reassessment of past approaches and accelerate progress in introducing private participation in distribution and in implementing related structural and regulatory reforms.

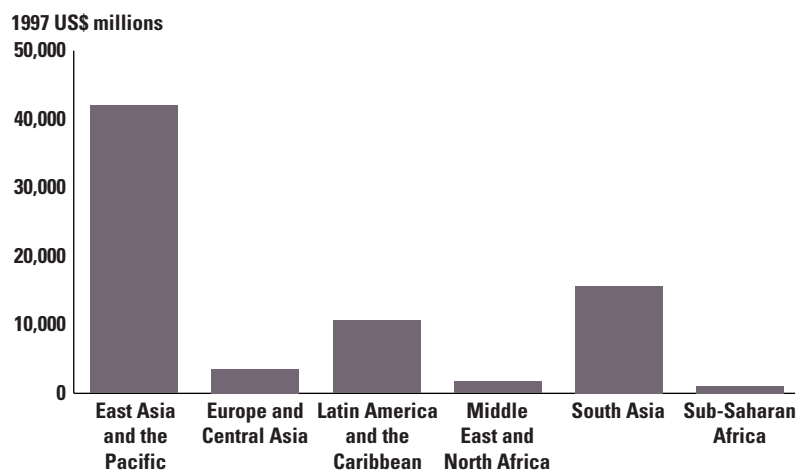
**Africa and the Middle East.** Private participation in electricity in Sub-Saharan Africa and in the Middle East and North Africa remains at a relatively early stage. This situation reflects limited progress in implementing cost-covering tariffs and in opening the sector to private capital and, particularly in many countries of Sub-Saharan Africa, investor perceptions of high country risk.

**FIGURE 6 INVESTMENT IN PRIVATE ELECTRICITY PROJECTS IN LATIN AMERICA AND THE CARIBBEAN, BY TYPE OF PROJECT, 1990–97**



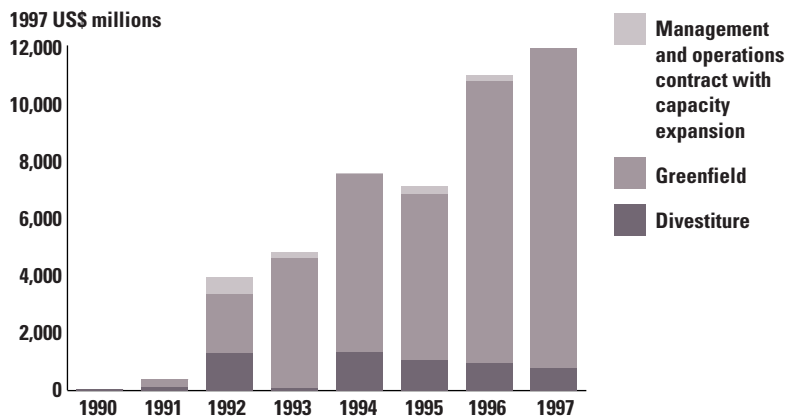
Source: PPI Project Database.

**FIGURE 7 INVESTMENT IN PRIVATE GREENFIELD PROJECTS IN ELECTRICITY, BY REGION, 1990–97**



Source: PPI Project Database.

**FIGURE 8 INVESTMENT IN PRIVATE ELECTRICITY PROJECTS IN EAST ASIA AND THE PACIFIC, BY TYPE OF PROJECT, 1990–97**



Source: PPI Project Database.

In Sub-Saharan Africa private participation has taken different forms. Five countries (Comoros, Côte d'Ivoire, Gabon, Guinea, and Guinea-Bissau) have transferred the management of their integrated utilities to private firms through management and operations contracts with major capital expenditure, while three countries (Ghana, Mali, and São Tomé and Príncipe) have awarded five management contracts. There have been nine greenfield power projects and two divestitures in the region. The divestitures have been relatively small and have involved isolated cases rather than entire electricity utilities.

In the Middle East and North Africa private participation in electricity has so far been limited to a few greenfield projects and a management and operations contract awarded by Morocco that covers both power and water. But if recent proposals are implemented, there should be a rapid increase in private participation throughout the region over the next few years.

## Conclusion

The electricity sector is at the forefront of the worldwide trend of growing private participation in infrastructure. Although sixty-two developing countries have made at least some progress in introducing private participation in electricity, the breadth and depth of the private participation remain uneven. The most successful countries have been those that have found

the political will to abandon a long history of subsidized tariffs and to establish regulatory frameworks that offer credible commitments to investors. The sustainability of forms of private participation that do not involve these elements is being tested in some countries in Asia, where recent experiences should provide important lessons for countries that are at an earlier stage in framing their private participation strategies.

<sup>1</sup> All dollar amounts are in 1997 U.S. dollars.

<sup>2</sup> The PPI Project Database records total investment, not private investment alone, in infrastructure projects with private participation.

<sup>3</sup> For a discussion on power markets in Argentina and Chile see Peter Lalor and Hernan Garcia, "Reshaping Power Markets—Lessons from Chile and Argentina" (Viewpoint 85, June 1996) and Antonio Estache and Martin Rodriguez-Pardina, "Regulatory Lessons from Argentina's Power Concessions" (Viewpoint 92, September 1996).

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

Viewpoint is an open forum intended to encourage dissemination of and debate on ideas, innovations, and best practices for expanding the private sector. The views published are those of the authors and should not be attributed to the World Bank or any of its affiliated organizations. Nor do any of the conclusions represent official policy of the World Bank or of its Executive Directors or the countries they represent.

To order additional copies please call 202-458-1111 or contact Suzanne Smith, editor, Room F6P-188, The World Bank, 1818 H Street, NW, Washington, D.C. 20433, or Internet address [ssmith7@worldbank.org](mailto:ssmith7@worldbank.org). The series is also available on-line ([www.worldbank.org/html/fpd/notes/notelist.html](http://www.worldbank.org/html/fpd/notes/notelist.html)).

♻️ Printed on recycled paper.