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**High-level Workshop on “Public-Private Partnerships’ implementation in the Energy Sector in Africa: Challenges, Best Practices and New Trends”**

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**Public-Private Partnerships in  
Africa’s Energy Sector:**

*Challenges, best practices,  
and emerging trends*

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# Preface

The Governance and Public Administration Division (GPAD) of the United Nations Economic Commission for Africa (UNECA) has launched a series of activities designed to promote private sector investment opportunities through PPPs, by tackling the key challenges associated with these kinds of projects in the different infrastructure sectors in Africa. The first sector selected is energy. African leaders have drawn attention to Africa's low access to modern energy and have backed the NEPAD's Short-Term Action Plan (STAP, 2002) target that at least 35 percent of the population has access to electricity by 2020. More recently, the 12<sup>th</sup> African Union Assembly (2009) undertook to institute reforms conducive to private sector investment in infrastructure and develop major regional and continental hydroelectric power projects to ensure energy security in Africa.

This paper is designed to be a key early output of the PPP-related activities of GPAD's 2010-2011 Work Programme, which in turn is part of a broader mandate of the UNECA to promote private sector and enterprise development in Africa. As a non-recurrent publication, this paper will serve as the main background document for a workshop entitled "Public-Private Partnerships in Public Service Delivery: Best Practices and Emerging Trends" that will be held in Addis Ababa at the end of June 2011.

## Acronyms & Abbreviations

AfD	Agence Française de Développement (French development agency)
AfDB	African Development Bank
AICD	Africa Infrastructure Country Diagnostic
AUC	Africa Union Commission
BOOT	build-own-operate-transfer
BOT	build-operate-transfer
Capex	capital investment
DAC	OECD Development Assistance Committee
DBSA	Development Bank of Southern Africa
DFI	development finance institution
DRC	Democratic Republic of Congo
ECA	Europe and Central Asia
EIA	U.S. Energy Information Administration
EIB	European Investment Bank
EPC	engineering, procurement, and construction
ESMAP	Energy Sector Management Assistance Program
EU	European Union
GPAD	Governance and Public Administration Division, UNECA
GPOBA	Global Program for Output-based Aid
HH	household
IBRD	International Bank for Reconstruction and Development (the World Bank's non-concessional lending arm)
ICA	Infrastructure Consortium for Africa
ICT	information and communication technology
IDA	International Development Association (the World Bank's concessional lending arm)
IFC	International Finance Corporation
IPO	initial public offering
IPP	independent power producer
IPS	Industrial Promotion Services – a division of the Aga Khan Fund for Economic Development
KenGen	Kenya Electricity Generating Company
KfW	Kreditanstalt für Wiederaufbau (German development bank)
KPLC	Kenya Power and Lighting Company
LAC	Latin America and the Caribbean
LIC	low-income country
MDB	multi-lateral development bank
MDG	Millennium Development Goal
MENA	Middle East and North Africa
MIC	middle-income country
MW	megawatt
NEPAD	New Partnership for Africa's Development
NGO	non-governmental organization
NPCA	NEPAD Planning and Coordinating Agency
O&M	operations and maintenance
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
PCG	partial credit guarantee

PHRD	Policy and Human Resources Development
PFI	Private Finance Initiative (UK)
PIDA	Program for Infrastructure Development in Africa
PIDG	Private Infrastructure Development Group
PPA	power purchase agreement
PPF	World Bank Project Preparation Facility
PPI	private participation in infrastructure
PPIAF	Public Private Infrastructure Advisory Facility
PPP	public-private partnership
PRG	partial risk guarantee
PSC	public sector comparator
REC	Regional Economic Community
SAPP	Southern African Power Pool
SOE	state-owned enterprise
SPV	special purpose vehicle
SSA	Sub-Saharan Africa
STAP	NEPAD Short-Term Action Plan
TANESCO	Tanzania Electric Supply Company
UNECA	United Nations Economic Commission for Africa
VGf	viability gap funding
WSP	Water and Sanitation Program
WSS	water supply and sanitation

# Executive Summary

## 1. Introduction

The huge shortcomings in access to infrastructure services in African countries suggest that such countries need much higher levels of infrastructure investment and more expertise to operate and maintain infrastructure facilities. The private sector provides one source for such resources and infrastructure projects involving private participation have increasingly been used in developing countries to involve private companies in different aspects of infrastructure service provision. But this trend has been much weaker in developing country regions with mostly low-income countries (LICs), like Sub-Saharan Africa, than regions with mostly middle-income countries (MICs), like Europe and Central Asia or Latin American.

This paper is intended to initiate an effort by the Governance and Public Administration Division (GPAD) of the United Nations Economic Commission for Africa (UNECA) to promote private sector investment opportunities through PPPs by identifying and addressing the key challenges associated with these kinds of projects in the different infrastructure sectors in Africa.

Energy is the first sector to be selected for GPAD's PPP focus, due to its central role in sustainable development and poverty reduction efforts in Africa. Energy services enable basic human needs, such as food and shelter, to be met. They also contribute to both economic transformation and social development by promoting manufacturing and improving education and public health. Without substantially increased investment in energy, the MDGs will be difficult to achieve, particularly in a generally poor region like SSA.

Probably no other infrastructure sector inhibits GDP growth across the African continent more than power. AICD estimates that over a ten-year period as much as US\$48 billion in new investment is needed annually in Africa to make up the spending shortfalls in all infrastructure sectors. But US\$29 billion, or 61 percent of that total, is needed in the energy sector.

The key question for this paper is how can the private sector play a larger and more beneficial role in improving infrastructure service provision in Africa's power sector? Is it possible to structure such arrangements so that governments and their citizens benefit in terms of affordable, reliable power, while at the same time motivating private companies to provide these services because of the profits they can earn?

## 2. PPI in SSA Service Delivery

Definitions of PPP and PPI. There is no authoritative, widely-used single definition of public-private partnership (PPP). A large variety of terms, definitions, and acronyms are used to describe private participation in public service provision. For the purposes of this paper, perhaps the simplest way to distinguish PPPs from traditional forms of government contracting is to



define them as risk-sharing relationships in which a legal contract assigns public service delivery responsibilities to a private entity. The PPP contract allocates risks and rewards associated with the delivery of these public services between the private entity and the public owner or sponsor of the project. In other words, the compensation received by the private entity for this involvement can vary depending on performance.

The private sector can be involved in infrastructure service provision in several different ways, including through PPP arrangements like concessions and management contracts, or via other forms of “private participation in infrastructure” (PPI) like divestiture and merchant projects. PPPs may be either brownfield, meaning that they involve rehabilitation or extension of existing assets (for example, an existing transmission line or distribution system), or greenfield, meaning that they involve the design and construction of new assets (e.g., a new power plant or new transmission lines). There are also two principal ways in which a private partner in a PPP is paid for its services: either by managing the commercial retail sale of services to customers, or via payments by governments or government utilities on a periodic basis (usually annually or semi-annually) for the wholesale sale of services by the private provider, as is usually the case with independent power producer (IPP) projects.

PPI in SSA. PPI in general has made a steadily growing contribution in Africa, but in terms of sectors, most of it (77 percent of investment) has been in the ICT sector and in terms of countries, most of it (60 percent) has been limited to Nigeria and South Africa. Overall, PPI contributes much less to a broad range of infrastructure services in Africa than it does in other developing country regions.

Some simple calculations illustrate the difficulties of completing PPI projects in SSA over the last decade: Starting with the 223 PPI projects reaching financial closure in SSA since 2000, then subtracting the telecom (merchant) projects (90) and the non-investment leases, management contracts and emergency rentals (43), leaves about ten PPI projects per year in water, transport and energy, with a grand total of approximately four projects per year located in countries other than Nigeria or South Africa.

Telecommunications: The telecommunications sector has attracted by far the largest amount of private investment in SSA over the last decade (76 percent of the total), with 97 projects in 37 countries, and US\$60 billion in investments. The vast majority of these projects were merchant projects involving no formal PPP-type risk sharing contract. This is of course the most commercial infrastructure sector, with relatively low capital costs, light regulation, but robust profits.

Transportation: From 2000-09, 57 transport projects were concluded in 19 SSA countries. Investments in these projects, plus projects that were initiated prior to 2000, totaled US\$10.8 billion. This represents about 14 percent of total infrastructure investment in SSA over this period, making transport the second most active PPI sector after telecommunications. Most of these were concessions for port (container) facilities or railroads.

Water and sanitation: From 2000-09, 15 water and sanitation projects were concluded in 13 SSA countries. Investments in these projects, plus projects that were initiated prior to 2000, totaled US\$179 million, making this sector by far the least active in terms of private participation

(accounting for just 0.23 percent of total infrastructure investment in the region). Long-term concessions have been tried without success in this sector. The prevailing type of PPP is the management or lease contract, such as those that have been reasonably successful in West Africa.

### **3. PPI in SSA's Power Sector**

SSA's power sector. The investment needs in SSA's power sector are immense. The total installed capacity of the 47 countries in SSA (excluding South Africa) is about equal to that of Argentina, and somewhat less than countries like Turkey and Thailand (as well as South Africa), less than half the capacity of a country like South Korea, and barely 20 percent of a country like Brazil. By 2008, electricity consumption in the 47 countries of SSA (population of 723 million) remained extremely low, about half that of South Africa (population of 47 million).

AICD estimates of needed investment. AICD estimates the annual infrastructure spending needs in SSA for the ten-year period leading up to 2015 at about US\$93 billion annually. The needs are based on what is required to (i) address the region's infrastructure backlog, (ii) keep pace with the demands of economic growth, and (iii) attain a number of key social targets for broader infrastructure access. Existing annual spending on infrastructure is also estimated by AICD, at about US\$45 billion per years, leaving an annual spending gap of about US\$48 billion. The funding gap in the power sector, at over US\$29 billion, is by far the largest of any infrastructure sector, representing over 60 percent of all infrastructure funding needs.

The global picture of PPI in power. Globally, the power sector attracts over 44 percent of all PPI investment (compared with 25 percent in transport and 26 percent in ICT). In 2009, energy was the only sector in which PPI investment increased across the developing world. Driven by the closure of huge power projects in Latin America and South Asia, total investment reached US\$68.5 billion, its highest total ever and 45 percent of all PPI investment in 2009. This was also the first year since 1997 that energy investment led all other sectors, including telecommunications.

The SSA track record. The situation in SSA is quite different. AICD found that current capital investment in SSA's power sector (from all sources) is about US\$4.6 billion per year, far less than the US\$26.7 billion needed to meet AICD's ten-year power sector development goals. The private sector contributes only about 10 percent of that current total, very little when compared with private investment in other sectors like ICT (77 percent of PPI). In dramatic contrast to the 2009 record-setting total of PPI in the developing world's global power sector, PPI in SSA's power sector amounted to only 3.5 percent of total PPI in 2009.

Problems with PPI project types. The investment performance of the various PPI project types used in SSA's power sector is quite modest, particularly when compared with other regions. Each project type has particular challenges that need to be addressed if private participation is going to play a more productive role in the sector (table 3.5).

**Table 3.5**  
Problems with the Use of PPI Project Types in SSA’s Power Sector

PPI Project Type	Performance since 2000	Problems & Challenges	Possible Remedies
IPPs	20 projects	Small markets, costly power, uncreditworthy off-takers expensive to prepare	Larger, regional projects under PIDA sponsorship
Hydro IPPs	2 projects	Very expensive, risky and controversial, preparation costs very high	Larger, regional projects under PIDA sponsorship
Distribution Concessions	7 projects	Large investment needs relative to revenue, govt regulation of tariffs	Political risk insurance, partial risk guarantees, conceded asset accounts
Management Contracts	9 projects	Costly to structure, hard to get incentives right, dependent on broader sector reforms	Include customer care in incentive structure, find more local partners
Divestiture	5 projects	Assets often in poor condition, few functioning share markets	Refurbish and maintain assets
Merchant Projects	No projects	African power markets are not liberalized	Broad sector reform

Source: Author’s compilation.

#### 4. Regional Power PPI

The problem of size. The possibility of developing regional PPI projects in SSA is an important topic because such projects (involving two or more government “owners” of the project) would address several key problems in sector. One is the small average size of SSA IPP projects (91 MW for the 38 IPPs studied by Eberhard and Gratwick, 2010). The small size makes them unattractive to many international companies—too much must be spent on project preparation compared with the ultimate financial returns and the risks that must be managed.

The need for hydropower. Another problem is the difficulty in developing large-scale hydropower resources in SSA. The AICD study points out that SSA accounts for 10 percent of the world’s economically feasible hydropower potential, but only about 7 percent of SSA’s potential is being exploited. AICD recommends that large regional hydropower projects be developed as a way to facilitate more energy sector investment in Africa. But most of the economically exploitable hydro resources are located in countries like DRC, Ethiopia, and Guinea, which cannot justify the full exploitation of such resources on the basis of their own national needs, and are far removed from industrial centers with the demand for that kind of supply. But if developed on a regional scale, these large hydropower schemes could be

financially and economically justifiable because they are designed to anchor cross-border power transmission and trading.

But so far, no truly cross-border hydropower generation projects (involving multi-country project ownership) have reached financial closure in SSA, and only two regional power projects of any kind have closed—both natural gas transmission projects. Other power generating projects are sometimes referred to as regional projects because although they are “owned” by a single country, excess power is generated and then sold to off-takers in other countries. But only a few IPPs fall into this category.

Exporters and importers. One problem with regional power projects is that the most cost-effective exploitation of regional hydropower resources would require the countries with power development potential to become exporters of power and others to become importers. AICD estimates that as many as 16 SSA countries would be economically better off if they imported more than 50 percent of their power needs. But this means that many African countries would have to reconcile themselves to a situation in which they were not responsible for their own energy security.

Risks and challenges of hydropower. Another problem is that hydropower projects are difficult to do under the best of circumstances. They have much higher upfront capital costs than thermal projects, require long and expensive preparation, often involve significant environmental impacts and social displacement, and almost always attract heated opposition from environmental NGOs and other civil society groups, both locally and internationally. Even with the help of MDBs and donors, hydro projects are difficult. The World Bank has done only one national-level hydro project in the last decade. Countries like Ethiopia can develop hydropower resources for their own needs, without private participation, but would have difficulties developing and financing projects large enough to supply the massive amounts of power needed by their neighbors.

The importance of national governments. Perhaps the fundamental problem with regional PPI projects in any sector is the fact that such projects depend on the strengths and will of the national governments involved, rather than regional organizations. This is the case because donors, MDBs, as well as the private sector prefer to deal with sovereign governments when it comes to financing and managing infrastructure projects. A key challenge will be for regional entities in Africa, like RECs and power pools, to help national governments reconcile their national interests with regional development needs.

Reasons for optimism. Lessons have been learned from previous attempts to develop regional projects in SSA, such as the NEPAD Short-Term Action Plan (STAP). Weaknesses in STAP implementation have been identified and can be avoided in the future. Another reason for optimism is the potential of SSA’s four regional power pools. Most of the pools still lack key skills as well as mandates to lead on planning and investment. And power trading is still in its early stages. But the pools are attracting help from many sources and seem ready to address these challenges.

The promise of PIDA. One additional reason for optimism in this regard is the ongoing Program for Infrastructure Development in Africa (PIDA), sponsored by the African Union, NEPAD, and

the African Development Bank. The results of the flagship PIDA study, due in early 2012, are expected to include the identification and prioritization of regional infrastructure projects, including regional PPI energy projects that donors, MDBs, and African actors can take forward into preparation.

## 5. PPI Performance Factors: *What Governments Can Do to Optimize PPI Performance in SSA's Energy Sector*

Three kinds of performance factors facilitate project outcomes that meet reasonable expectations: (i) macro-economic factors, (ii) country-level factors, and (iii) project-level factors. These factors, and government options for dealing effectively with them, are discussed under each of these headings (summarized in table 5.1).

**Table 5.1**

PPI Performance Factors:

What governments can do to optimize them

Factors	Potential Problems	Government Actions
Macro-economic factors	<ul style="list-style-type: none"> <li>- Local currency depreciation;</li> <li>- Interest rate increases;</li> <li>- Lower economic growth;</li> <li>- Shortage of project finance for small projects in risky countries.</li> </ul>	<ul style="list-style-type: none"> <li>- Maintain emphasis on infrastructure investment;</li> <li>- Use government or donor/MDB funding to substitute for private sources;</li> <li>- Structure projects to deal with private sector risk perceptions.</li> </ul>
Country-level factors	<ul style="list-style-type: none"> <li>- Weak political leadership;</li> <li>- Poor investment climate;</li> <li>- Flawed policy, planning, regulation;</li> <li>- SOEs given preference;</li> <li>- Weak capacity to procure, negotiate, monitor, etc.</li> </ul>	<ul style="list-style-type: none"> <li>- Strengthen focus on business climate;</li> <li>- Seek capacity-building technical assistance from donors/MDBs;</li> <li>- Focus on best project candidates in priority sectors, leave the rest for ODA.</li> </ul>
Project-level factors	<ul style="list-style-type: none"> <li>- Project fragility caused by severe problems with PPI project cash flows &amp; profitability in poor countries.</li> </ul>	<ul style="list-style-type: none"> <li>- Structure projects to reduce private partner risks;</li> <li>- More donor/MDB help mitigating increased public partner risks;</li> <li>- Careful use of 3rd party guarantees.</li> </ul>

Source: Author's compilation.

Macroeconomic factors. Macroeconomic factors affect PPI in many ways, but the most direct impacts are on the cost of financing (resulting from changes in interest rates) and the value of project revenues (resulting from changes in the value of local currency or the local demand for services). The Asian Crisis of 1997 and the global financial crisis ten years later provide abundant examples of how macroeconomic shocks can affect PPI, depending on sources of finance and project structures.

Governments can mitigate macroeconomic risks by not backing away from infrastructure programs during times of crisis because they can provide a counter-cyclical economic stimulus during such periods. Governments can also preserve the momentum of PPI programs by using public finance (their own funds or money from donors and MDBs) to substitute for private sector finance until markets recover. Without the ability to contribute directly to project financing, poor countries need to rely more heavily on donors and MDBs, as well as the country-level and project-level options described below.

Country-level factors help explain why some countries managed these macroeconomic stresses well and others do not. These factors include things like political leadership, the investment climate, policy-making, planning, and regulation, as well as human resource capacity for project development, procurement, monitoring, and renegotiation.

Some SSA governments are taking strong leadership positions in favor of PPI and are making steady improvements in the enabling environments for such projects. Governments can access technical assistance funding from entities like the Investment Climate Facility (ICF) to keep this momentum going. Governments must also be ready to take forceful leadership roles when dealing with external sources of finance (donors, MDBs, non-OECD countries, the private sector), who often focus on their own funding priorities. Successful PPI programs in poor countries depend on maximizing demonstration effects by prioritizing those few project opportunities with strong chances for success – and leaving the rest for public works procurement funded by government budgets, ODA or Non-OECD financiers. Governments must think ahead about which projects will make sense as PPPs and which must be funded in some other way, otherwise they risk losing the best PPI opportunities.

Project-Level Performance Factors center around the ability of projects to meet expectations regarding cash flows and profitability. Profitability is often a longer-term objective of such projects, but in the meantime projects must achieve reasonably positive cash flows in order to have cash on hand to pay bills, particularly debt service. Without sufficient cash, projects can experience cash flow crises and become vulnerable to collapse. Unfortunately, non-recourse project finance techniques make PPI projects highly sensitive to problems with cash flows and profitability because of the high debt-equity ratios used in such projects to protect project sponsors. Lenders normally insist on tightly engineered PPP contracts, which shift project risks mostly to government partners. But in times of crisis, such measures have not worked well.

These concerns about cash flows and profitability continue to be important factors that limit private sector interest in PPI projects, especially in poor countries where governments may be less willing or able to meet financial commitments associated with large projects. The private sector now more carefully avoids PPI projects in poor countries like brownfield electricity distribution concessions, in favor of project structures less likely to experience problems with cash flows and profitability. Governments can and do structure projects that reduce these risks for private partners, but should realize that in doing so they are increasing their own risks, and the need for wider sector reforms to make sure those risks do not materialize.

How Donors/MDBs Can Help. In the haste to reestablish their involvement in power sector financing, donors and MDBs have sometimes lost sight of the need to strongly promote private

participation in the sector. As a result of this, too many power projects in Africa are going through early stage preparation by governments as if donors or MDBs will provide all of the financing. Later, when the need for private participation becomes more clear, it is often difficult and expensive to change direction.

Among other things, African countries need help in comprehensively planning, targeting, and prioritizing the use of PPI, ODA, non-OECD finance (mostly from Chinese, Indian and middle-east investors), and own-source revenues. The lack of this kind of planning often means that potentially successful PPI projects are pre-empted by ODA or non-OECD financing, or are attempted in situations where modest efficiency improvements offer opportunities for quick wins.

Most of the structuring options available to governments in making projects more attracting to the private sector involve substantial government financial contributions to projects. In most African countries this kind of government support is not possible without sovereign-backed concessional borrowing that can be passed on to projects in the form of debt or equity. Donors and MDBs could facilitate more PPI projects in these countries by finding ways of allowing more of this kind of sovereign borrowing and tailoring it to the needs of PPI projects.

Donors and MDBs also need to harmonize their approaches to the identification of PPI projects. Not infrequently a development partner will select a project for ODA support, which might be a good candidate (usually one of few viable country candidates) for private sector participation.

## **6. Addressing the Most Urgent Need: *PPI Project Preparation***

The importance of preparation. Project preparation is perhaps the most important PPI performance factor—one that warrants its own extensive discussion because of its singular importance. Poor preparation can seriously undermine the viability of a PPI project even if the other main performance factors discussed in the last chapter have been optimized. Good preparation also can help optimize these other factors: it can demonstrate to governments the benefits of using PPI options, and can help in selecting the best option. Preparation is essential in confirming for potential private partners that projects are commercially viable and can avoid major problems with cash flows and profitability. Sound preparation can also help with enabling environment problems, by carrying out limited reforms as part of the “upstream” preparation process, and structuring contracts to take into account legal and regulatory weaknesses of host governments.

Ideally of course, external funding of these costs should not be necessary. Rational and fully informed economic actors would not prepare an infrastructure project without confident expectations that the project would be viable and able to generate overall benefits sufficient to outweigh its overall costs, including the costs of project preparation. But the estimation of project costs and benefits is far from a perfect science. This is especially true of large power projects in low-income country regions like SSA where project preparation is plagued by lack of operational data, and project implementation by unforeseen costs. In these environments the risk of losing money spent on project preparation represents a kind of uncertainty that often acts as a barrier at entry, by keeping both public and private participants from moving the projects

forward. This uncertainty that keeps projects from moving forward represents a kind of market failure that arguably warrants correction through some form of external support from donors or MDBs.

What must be paid for. An important but under-funded element in efforts to prepare African projects has often been “upstream” project preparation. Even if money is available for feasibility studies, the lack of basic legal and regulatory frameworks for the targeted sector can easily stall project development. Incomplete policies, plans and procedures can have similar effects. It is often difficult to get help for these activities from local or regional DFIs, donors, or MDBs. Donors often support PPP project preparation, but the amounts of funding available are relatively small and donor support for upstream project-specific work is scarce largely because it is risky – it is so far upstream from actual transactions that it may or may not result in financial closure of a deal. This makes the work unattractive to private sector developers, who must recover development costs from completed deals, but also unappealing for donors, who must justify expenditures with tangible results that clearly promote development objectives.

Costs of preparation. Very little research has been done on the costs of PPI project preparation in developing countries, but what has been done on such costs in the UK and Europe, suggests that costs in poor countries are very high, particularly considering the lack available data needed for feasibility studies as well as the need for considerable upstream preparation in these countries. Cost estimates for preparing large PPI projects in Africa’s power sector would reasonably include the following elements:

- Minimum costs to governments of upstream preparation are likely to be in the 3-5 percent range for large projects up to US\$1 billion in size, with a gradual decrease in preparation cost percentages for projects over US\$1 billion.
- Costs to governments associated with transaction work (PPP procurement and contract negotiation) on large regional projects are likely to be in the 4-5 percent range (assuming some overlap with upstream preparation).
- Total transaction costs for bidders are likely to be 10-12 percent, with the winning bidder expected to spend 4-5 percent and losing bidders the balance.
- New or particularly difficult sub-sectors (like hydropower) or large regional projects involving more than two countries, will likely warrant a 2-3 percent premium (shared between public and private partners). Unfortunately this is likely to apply to any large infrastructure project in Africa that combines MDB and private financing because few such projects have been completed on the continent. There have been only two African hydro PPP projects since 2000 (both under 400 MW in size).

This puts total expected preparation costs of large power projects involving MDB and private sector financing in the range of 19-25 percent of total capital investment, and costs to governments at about 8-12 percent. For a US\$500 million power project, a minimum of about US\$95 million would be required for total preparation and about US\$40 million for direct government costs alone.

Who has money for preparation? Governments have several options for covering project preparation costs. Countries can engage IFC Advisory to provide transaction assistance on PPP projects. Countries may also use donor resources either directly via bilateral programs or



through multi-donor trust fund programs like PPIAF, WSP, GPOBA or several of the PIDG facilities. Various project preparation facilities also been established, typically with donor support, by African DFIs and Regional Economic Communities. Finally, many national governments in Africa have also established PPP units largely to regulate the process of PPP project development in their countries and control resulting contingent liabilities for governments. But most of these facilities face severe limits on the amounts of funding they can make available for the preparation of individual projects, and differences in business plans and operating rules make it difficult for these facilities to work together.

What is needed? Grant funding is needed to help governments prepare large PPI projects. The World Bank has found that slow project start-up and readiness is a major cause of project delays and cost increases. Slow start-up, in turn, often results when governments must borrow money for preparation funding—this prompts them to use a sequential approach to project preparation tasks. This means that preparation steps are done one at a time, with a new step taken only when that last is completed and new money is sourced for the next step. Grants facilitate less risk-averse behavior on the part of governments, allowing a broad range of government preparation activities to be carried out prior to or in parallel with processing of main project financing by MDBs and/or private financiers, including government financial and technical feasibility studies, detailed design work, safeguard activities as well as basic procurement. The sequential approach to preparation is increasing preparation time by 12-24 months.

Most of the new external grant support is needed to help cover the public sector costs of preparation, although in some sub-sectors like hydropower, or for particularly large and risky projects, some private sector support is probably also warranted, perhaps on a cost-reimbursement basis involving winning bidders. A trust-funded facility of this kind could not be expected to cover the full costs of even government preparation of a large infrastructure project, which this paper estimates at US\$40 million for a US\$500 million project. But US\$15 million for a project of this size would cover most of the advanced preparatory work described above, and help avoid government adoption of a sequential approach to preparation. MDB loans and other grant funding could cover the balance needed for preparation. An initial trust fund capitalization of US\$300 million would be enough for the facility to work with 4-6 large power projects per year over its three-year pilot period.

# 1. Introduction

## 1.1 Purpose of this Paper

The huge shortcomings in access to infrastructure services in African countries suggest that such countries need much higher levels of infrastructure investment and more expertise to operate and maintain infrastructure facilities. The private sector provides one source for such resources and infrastructure projects involving private participation have increasingly been used in developing countries to involve private companies in different aspects of infrastructure service provision. But this trend has been much weaker in developing country regions with mostly low-income countries (LICs), like Sub-Saharan Africa, than regions with mostly middle-income countries (MICs), like Europe and Central Asia or Latin American.<sup>1</sup>

In response to these challenges, there has been growing interest in the role the private sector could play in infrastructure and public service provision, particularly through public-private partnerships (PPPs) and other forms of private participation in infrastructure (PPI). But such projects in Africa have produced mixed results, especially when compared with other developing country regions. Since 2000, SSA has accounted for only about 9 percent of the global total infrastructure investment related to private participation in infrastructure; 75 percent of that investment has been in telecommunications, and 60 percent of it has taken place in just two countries, Nigeria and South Africa.

This paper is intended to initiate an effort by the Governance and Public Administration Division (GPAD) of the United Nations Economic Commission for Africa (UNECA) to promote private sector investment opportunities through PPPs by identifying and addressing the key challenges associated with these kinds of projects in the different infrastructure sectors in Africa.

## 1.2 Why Begin with Energy?

Energy is the first sector to be selected for GPAD's PPP focus, due to its central role in sustainable development and poverty reduction efforts in Africa. Energy services enable basic human needs, such as food and shelter, to be met. They also contribute to both economic transformation and social development by promoting manufacturing and improving education and public health. Without substantially increased investment in energy, the MDGs will be difficult to achieve, particularly in a generally poor region like SSA.

As this paper attempts to demonstrate in subsequent sections, PPI in most other developing country regions has helped governments develop their power sectors through more efficient management of facilities and resources, and more capital investment. But in Africa, this has mostly not happened. On average over the last decade, only about 10 percent of all private sector investment in Africa goes into the energy sector, and that percentage has declined further over the last several years. As a result, PPPs have been of little help in addressing the region's

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<sup>1</sup> LIC and MIC refer to country categories used in OECD's list of countries eligible for development assistance.

power sector problems. And according to the recently completed African Infrastructure Country Diagnostic (AICD) study (Foster and Briceño-Garmendia, 2010), those problems are already severely retarding economic development and poverty alleviation:

- Power supply. SSA has fallen far behind other developing country regions in building installed generating capacity. SSA's capacity has developed at only about 3 percent annually over the last three decades, falling far behind as the region's GDP growth rate has accelerated to about 5 percent in recent years.
- Access rates. Rates of access to electricity in SSA have also stagnated as population growth has exceeded growth in new connections. Only about 20 percent of the population in the region has access to electricity, compared with 50 percent in South Asia and 80 percent in Latin America. In rural areas, with two-thirds of SSA's population, only about 12 percent of households have access to electricity.
- Reliability. The economic costs of power outages can reach 4 percent of GDP in some countries, as manufacturing enterprises face an average of 56 days per year without power. Informal sector businesses that lack their own backup generation capability face outage-related losses equal to as much as 20 percent of turnover. Shortages in some areas have been triggered or exacerbated by the impacts of droughts, oil price shocks, and conflict.
- Costs and tariffs. Power costs are unusually high in SSA, because of heavy reliance on small scale production, inefficient technology (too much diesel-based generation and too little hydropower), and widespread use of expensive, short-term leases for generating capacity, which can cost the equivalent of 3-4 percent of GDP in some countries. Tariffs are also very high, as much as three to four times more expensive than in South Asia and twice as high as East Asia, but they still do not cover costs because of poorly targeted subsidies, collection inefficiencies, and distribution losses.
- Power consumption. In 2005, the World Bank characterized SSA as the only region in the world where consumption was actually falling, because population growth was outstripping supply. Recent data suggests that consumption is now growing, but very slowly. At any rate, AICD estimates that the per capita electricity consumption in SSA is barely enough to power one light bulb per person for six hours per day.

Probably no other infrastructure sector inhibits GDP growth across the African continent more than power. AICD estimates that over a ten-year period as much as US\$48 billion in new investment is needed annually in Africa to make up the spending shortfalls in all infrastructure sectors. But US\$29 billion, or 61 percent of that total, is needed in the energy sector.

### **1.3 Is PPI a Realistic Alternative in SSA?**

No one disputes that the power sector in SSA is in crisis, but this does not necessarily mean that the private sector can make a significant contribution to a solution for the sector's problems. As subsequent sections of this paper demonstrate, PPPs and other forms of private participation

in infrastructure (PPI) are extremely difficult to do well in SSA—in any sector other than telecommunications. If it takes so much time and money to properly prepare these projects, and they are particularly difficult to do in poor countries, what justifies special attention to PPI in SSA rather than more effort to enhance traditional forms of public investment in and management of power facilities? After all, countries like Ethiopia have ambitious plans for developing their own power sectors without using the private sector. Why are donors and MDBs unable to help governments develop their power sectors without the need to rely on the private sector?

There are several reasons for focusing on PPI in Africa's power sector:

- Value for money. Private participation in the energy sector, even in poor countries, is generally viewed as successful in terms of meeting reasonable government objectives for investment and improved operating efficiency. A Stanford University study of IPPs in 12 countries covering the five years after the Asian Crisis in 1997 found that two-thirds of the projects resulted in investment leading to power generation, at prices and quality levels that met reasonable government expectations (Woodhouse, 2005). In an energy sector study comparing the performance in power distribution of 160 PPI projects with 90 state-owned enterprises, the World Bank found that PPI on average decreased distribution losses (by 11 percent), while increasing bill collection rates (45 percent), increasing the electricity sold per worker (32 percent), as well as the number of residential connections per workers (29 percent) (Gassner, et al., 2009).
- Global track record. IPPs are widely used in the developing world, including poor countries, and routinely account for 30-35% of all PPI-related investment commitments in countries like Vietnam and India, slightly less in Bangladesh, and more (close to 50%) in Pakistan. Energy is the only sector in which global investment numbers do not appear to have been affected by the recent global financial crisis. In fact, PPI-related investment in energy reached an all-time record level in 2009, accounting for over 45 percent of all such private investment across the developing world, more than investment in telecommunications (and all other sectors) for the first time since 1997.
- Performance in SSA. Overall, the private sector still plays only a marginal role in SSA's power sector, but three-quarters of the 24 countries surveyed by the AICD study had introduced some form of PPI in the sector, one-third had IPP projects, seven had more than one IPP, and several (including Kenya and Cote d'Ivoire) had registered significant successes with IPPs. Despite difficulties with PPI projects in the past, countries like Nigeria and Ghana are planning massive increases in private participation in their energy sectors. In their pioneering study of IPPs in SSA, Eberhard and Gratwick (2010) found that,

*“...IPPs have been an important source of new investment in the power sector in a number of African countries.”* (p. 3)

*“...the majority of projects have delivered and their contracts have been upheld.”* (p. 5)

“...the performance of IPPs is generally superior to that of state-owned plants.” (p. 30)

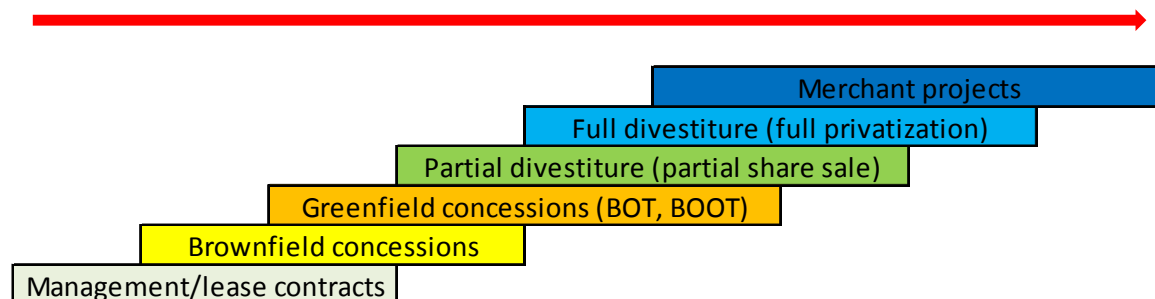
- **Resource scarcity.** AICD estimates that about US\$4.6 billion from all sources is invested annually in SSA’s power sector. About half of that total comes from a combination of PPI, official development assistance (ODA), and non-OECD sources (like China, India, the Middle East, etc.). But an additional US\$22 billion in capital investment is needed annually. In other words, filling this gap would require a ten-fold increase in the combined power sector investments made by PPI, ODA, and non-OECD financiers. Some African countries can meet their own individual power sector investment needs without the private sector’s help. But SSA as a whole cannot.

## 1.4 This Paper

**Key questions.** This paper addresses several key questions: how can the private sector play a larger and more beneficial role in improving infrastructure service provision in Africa’s power sector? Is it possible to structure such arrangements so that governments and their citizens benefit in terms of affordable, reliable power, while at the same time motivating private companies to provide these services because of the profits they can earn? Which of the PPI project options (figure 1.1) will work best in SSA? What can Africa learn from best practices in other regions? What part should be played by stakeholders in efforts to expand the use of such projects in Africa? The overall objective of this paper is to generate insights in all of these areas that can offer guidance to key actors and stakeholders on how best to involve the private sector in power projects in Africa.

**Figure 1.1**

Degrees of Private Participation in Power - and potential profitability



Source: Author’s compilation.

**What this paper does not cover.** There are several important topics relating to PPI in SSA’s energy sector, which are beyond the scope of this paper. One is the role that the private sector can and does play in projects involving renewable energy generation and energy efficiency. A second is the potential for private sector involvement in nuclear power generation in SSA. A third is energy sector regulation—it is discussed at several points in this paper, but it was not possible to do full justice to this topic in the limited time available for this study. A fourth is the role of small-scale service providers in Africa’s energy sector—the role is important, but very little data exists on this topic. Finally, North African countries offer valuable lessons with regard to IPPs and other aspects of PPI in the power sector, but because of limitations inherent in the

most accessible PPI-related data it proved impossible to comprehensively integrate North African PPI topics into this paper.

Organization. In addition to this introductory section, this paper is divided into five main chapters:

- Chapter 2 (*PPI in SSA Service Delivery*) discusses the role of PPPs and other forms of private participation in infrastructure (PPI) in public service delivery in Africa, and includes a status assessment, as well as a discussion of trends and lessons learned.
- Chapter 3 (*PPI in SSA's Power Sector*) offers an assessment of the status of PPI projects in the energy sector in Africa and the main challenges facing the implementation of projects types in this sector.
- Chapter 4 (*Regional Power PPI*) examines the need for and main challenges to regional and cross-border PPI projects in Africa's energy sector, as well as measures and mechanisms designed to address these key challenges.
- Chapter 5 (*PPI Performance Factors: What Governments Can Do to Optimize PPI in SSA's Energy Sector*) discusses three kinds of factors that affect the performance of PPI projects in SSA's power sector, their causes, and what governments can do to address the challenges resulting from these factors. Factors discussed are (i) Macroeconomic factors, (ii) Country-level factors, and (iii) Project-level factors. This chapter concludes with comments on what donors and MDBs can do to help.
- Chapter 6 (*Addressing the Most Urgent Need: PPI Project Preparation*) discusses the single most important PPI project performance factor affecting projects in SSA's power sector, project preparation.
- Chapter 7 (*Conclusions*).
- Each chapter also includes case studies (formatted as text boxes) that are used to highlight successes and failures of efforts to facilitate more private sector participation in Africa's energy sector.

Notes on terminology: throughout this paper, unless otherwise indicated, "Africa" refers to Sub-Saharan Africa (SSA). The term "private participation in infrastructure" (PPI) is used in this paper to refer to public-private partnerships (PPPs), as well as other forms of private participation, like divestiture and merchant projects (these terms are defined in Chapter 2).

## **1.5 Sources**

Although a significant body of existing analytical literature covers private sector involvement in such projects, most of it focuses on projects in MICs, where the vast majority of PPPs in the power sector have been developed. A few short analytical pieces have addressed the problems of

doing such projects in LICs, but more substantial studies focused specifically on this latter group of countries are rare.<sup>2</sup>

However, several sources of information now exist, which together shed some light on this topic.

- The PPI Project Database, managed by the World Bank and PPIAF, continues to accumulate information on investment commitments associated with 4,600 PPI projects in 137 countries, information that can be broken out by country income category.
- After several years of work, the flagship report of the AICD study was published in 2010. Sponsored by the African Union, NEPAD and the African Development Bank, AICD is a donor-funded survey of infrastructure financing needs in African countries, which includes the most comprehensive data ever assembled on this topic.
- In addition, recent work at African institutions have focused on the African energy sector and now offer some of the best insights available on private participation in this sector. Special mention must be made of the work by Anton Eberhard and his colleagues at the University of Cape Town's Graduate School of Business, Programme for the Management of Infrastructure Reform & Regulation (MIR).

The recovery of the developing country market for projects involving private funding and/or management over the 2002-07 period triggered new analytical work focused on what went wrong with such projects in the aftermath of the Asian Crisis, and what started working after the end of the 1990s. These studies provide information on innovative types of contracts, new kinds of project companies, and changing sectoral priorities, all of which offer lessons about risk mitigation and project structuring that may have application in Africa. The global financial crisis that affected this market beginning in 2007 has also prompted surveys and research that assesses impacts on the poorest countries.

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<sup>2</sup> See Houskamp and Tynan (2000) and Leigland (2010a).

## 2. PPI in SSA Service Delivery

### 2.1 Overview

This chapter sets the stage for a discussion of PPPs in Africa's energy sector by talking about all kinds of private participation in infrastructure (PPI), globally and in Africa. This discussion covers the history of such projects, the current status of PPI in Africa, emerging trends and lessons learned. The following topics are included:

- A Typology of PPPs and Other Forms of PPI
- PPI: The Global Context
- PPI in SSA
- Impacts of the Financial Crisis on PPI in SSA
- Types of PPI Projects Used in Africa
- PPI in Telecommunications, Transport, and Water

This chapter concludes that PPI in general has made a steadily growing contribution in Africa, but in terms of sectors, most of it (75 percent of investment) has been in the ICT sector, and in terms of countries, most of it (60 percent) has been limited to Nigeria and South Africa. Overall, PPI contributes much less to a broad range of infrastructure services in Africa than it does in other developing country regions. The impacts on African PPI of the recent global financial crisis underscore the fragility of the PPI market in Africa, and the need for concerted action by governments and other stakeholders to ensure that PPI makes more of a contribution to infrastructure development needs on the continent.

### 2.2 A Typology of PPPs and Other Forms of PPI

There is no authoritative, widely-used single definition of public-private partnership (PPP). A large variety of terms, definitions, and acronyms are used to describe private participation in public service provision. For the purposes of this paper, perhaps the simplest way to distinguish PPPs from traditional forms of government contracting is to define them as risk-sharing relationships in which a legal contract assigns public service delivery responsibilities to a private entity. The PPP contract allocates risks and rewards associated with the delivery of these public services between the private entity and the public owner or sponsor of the project. In other words, the compensation received by the private entity for this involvement can vary depending on performance.

It is worth distinguishing several different ways in which the private sector can be involved in infrastructure service provision, including the important difference between PPPs and other forms of "private participation in infrastructure" (PPI) (table 2.1). The highest profile form of PPP involves investment by the private entity in the assets needed for service delivery, as well as operation of the assets over a long period of time. In other words, public service provision is expected to benefit from private sector efficiencies in managing service provision, as well as private sector expertise in financing and constructing (or rehabilitating) public assets. Usually, these kinds of PPP contracts, often referred to as **concessions**, must be long-term in order for the



private entity to recoup its investments via the sale of the services. An example of this kind of contract would be an electricity distribution concession, in which a private company takes over management of a power distribution utility, rehabilitates and extends the assets, then manages distribution of power to customers and recoups its investments via user fees.

**Table 2.1**

A Typology of PPPs and Other PPI Projects

<p><b>PPP Types:</b></p> <ol style="list-style-type: none"><li>1. <b>Brownfield concession</b> – a private entity takes over the management of an <u>existing</u> government-owned enterprise and also assumes significant risk for investments needed to extend, complete, or rehabilitate the enterprise facilities.<ul style="list-style-type: none"><li>• Rehabilitate, operate, and transfer (ROT)</li><li>• Rehabilitate, lease or rent, and transfer (RLT)</li><li>• Build, rehabilitate, operate, and transfer (BROT)</li></ul></li><li>2. <b>Greenfield concessions</b> – a private entity builds and operates a <u>new</u> facility for a period, and under conditions, specified in a contract.<ul style="list-style-type: none"><li>• Build, lease, and transfer (BLT)</li><li>• Build, operate, and transfer (BOT)</li><li>• Build, own, and operate (BOO)</li></ul></li><li>3. <b>Management and lease contracts</b> – a private entity manages a government-owned facility for a period, and under conditions, specified in a contract, but the government retains responsibility for investments. Government rental of mobile power plants owned and operated by private sponsors are also included in this category.</li></ol> <p><b>Other Types of Private Participation in Infrastructure (PPI):</b></p> <ol style="list-style-type: none"><li>1. <b>Divestiture</b> – transfer of equity ownership from government to a private entity via asset sale, public offering, or mass privatization program.<ul style="list-style-type: none"><li>• Full – the entire enterprise or facility is sold; the government retains no interest.</li><li>• Partial – via partial share sale; the government maintains an ownership share.</li></ul></li><li>2. <b>Merchant</b> – a private sponsor builds a new facility at its own risk in a liberalized market, with no revenue guarantees provided by the government.</li></ol> <p>Source: Adapted from the World Bank and PPIAF, PPI Project Database</p>
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Another typical example of this kind of concession in the power sector is the so-called “**independent power producer**” (IPP) project. This usually involves the development of a new (greenfield) power generating facility by a private company that sells the power on a wholesale basis to government utilities that distribute it to individual customers. In the case of IPPs, the assets may belong to the private company, but the power must be sold to the government (or a government power utility) for retail distribution as a public service to customers. For IPPs, the critical form of PPP contract is usually the “**power purchase agreement**” (PPA) between the private power generator and the government purchaser of the wholesale service.

A less widely used form of PPP, but one with relevance for the topics discussed in this paper, involves a contract that requires management of public services by a private entity, but not major capital investment. These contracts are typically shorter in term because the private entity does not need long periods of time to recoup investments. An example of this kind of contract would be a **management contract**, pursuant to which a private entity would manage (but not invest in) a government-owned power distribution company, for which the private entity would be

compensated via annual payments from the government rather than by selling power to customers.

It is worth noting that PPPs may be either “**brownfield**,” meaning that they involve rehabilitation or extension of existing assets (for example, an existing transmission line or distribution system), or “**greenfield**,” meaning that they involve the design and construction of new assets (e.g., a new power plant or new transmission lines). It is also worth keeping in mind the two principal ways in which a private partner in a PPP is paid for its services: either by managing the commercial **retail sale** of services to customers, or via payments by governments or government utilities on a periodic basis (usually annually or semi-annually) for the **wholesale sale** of services by the private provider. These government payments may be referred to in a number of ways, for example, “unitary” or “annuity” payments.

Finally, two additional kinds of PPI project should be distinguished from PPPs as defined above. The first is **divestiture or privatization** of government assets, in which a government relinquishes ownership of assets by selling them to a private company. The sale itself is not a form of PPP as defined above, but the subsequent use of those assets in public service delivery might qualify, as in the case of a power plant sold to a private company that in turn signs a PPA to sell the power back to the government for retail sale to customers through a government-owned distribution utility (this would be a brownfield IPP). The second is **merchant projects** involving the ownership, construction and operation of assets by a private company at its own risk without a government commitment to buy the services. In telecommunication or energy sectors, merchant projects normally operate in liberalized markets where the sale of services is unrestricted by a PPP contract with government—in other words, the private entity is free to sell the services to anyone who can pay.

Divestitures and merchant projects have grown in popularity since the mid-1990s because in many cases they are less risky for private companies. Both of these additional kinds of PPI project are important, valuable ways in which the private sector can be involved in infrastructure services, and both will be touched on in this report. But both are also somewhat different from PPPs as defined here.

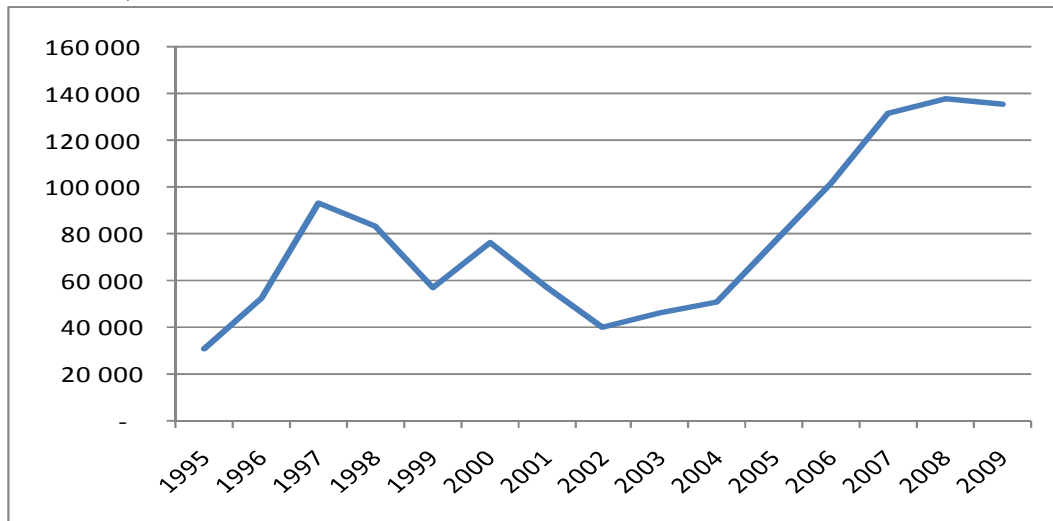
### **2.3 PPI: The Global Context**

Since the late 1980s, the World Bank has tracked the progress of all the kinds of projects identified above under the general heading of “private participation in infrastructure” (PPI). The Bank’s data indicates that PPI has experienced a roller coaster ride of popularity since the early 1990s (figure 2.1).

**Figure 2.1**

PPI Investment in Developing Countries (water, energy, transport, telecom), 1995-2009

Current US\$ millions



Source: World Bank and PPIAF, PPI Project Database

In the late 1980s, the growing popularity of private involvement in service delivery operation and management was to a large extent a reaction against government provision of services, either directly by government enterprises or indirectly with the help of government subsidies. Traditionally, governments in developing countries tended to assume that markets could not deliver beneficial public services, and opted to provide goods and services themselves. The result of this intervention often was to distort markets and “crowd out” the private sector. Because government and donor resources were limited, these direct interventions either failed to meet public service needs or generated temporary and unsustainable supply. In the worst cases, the supply of the goods and services became a form of patronage. By the end of the 1980s, widespread problems with poorly conceived state involvement in basic service delivery provided the basis for a return to an economic policy framework with much more of an emphasis on market-based provision of these services.

In the early 1990s, the development community sometimes took this view of market-based service provision to an extreme, generally viewing private participation in a large variety of infrastructure service situations as workable on a self-sustaining basis with customer tariffs set at full cost-recovery levels. It was assumed that costs of services provided to poor customers generally could be covered by cross-subsidization, with wealthier customers charged more to cover these costs. Traditional forms of government intervention, including the use of government subsidies, were viewed as a thing of the past for services like water, power, and transport, which (it was thought) could recover the costs of operations and maintenance (O&M) as well as capital investment from tariffs charged to users. By the mid-1990s, the World Bank began sharply cutting back its infrastructure lending because of the expectation that the private sector would largely fill infrastructure investment and service delivery needs in many developing countries.

The Asian Crisis in 1997 triggered a long period of decline in PPI by demonstrating to the development community that (among other things) the private sector could not always be

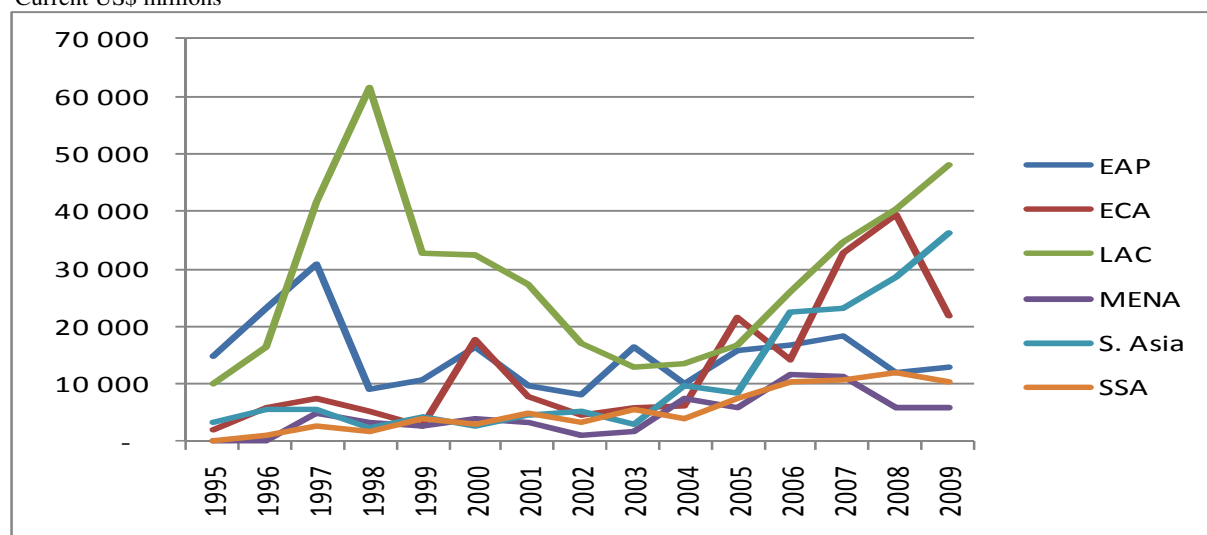
expected to take on and mitigate all the commercial risks associated with basic service provision, and assigning project risks to the public sector did not automatically mean that those risks would be effectively managed. And although measures like cross-subsidization proved to be useful, they were often inadequate by themselves to generate enough extra revenue to fill the gap between actual costs of provision and what poor customers were willing or able to pay. In any case, a growing body of research documented that even in most developed countries customers did not pay the full cost of basic services. It became clear that more meaningful government risk sharing was warranted and even essential in many cases. The global PPI market started to rebound in 2002 as it began to find ways of reducing risks for private partners, or finding more effective ways of shifting them to public partners via capital grants, subsidies, political risk insurance, and other measures. The PPI market also began to change structurally after the Asian Crisis, with a growing percentage in the mix of less risky divestitures and merchant projects, fewer brownfield projects (which turned out to be much riskier in developing countries than expected), and fewer, bigger projects in general, perhaps in recognition of the high costs of preparing well structured, sustainable PPI projects in developing countries.

Different regions of the developing world have had very different experiences with PPI, largely due to different levels of GDP, degrees of local capital market development, and proximity to the project finance banking institutions of Europe and North America (figure 2.2). Latin America, with only one LIC, was by far the most active region in terms of PPI in the late 1990s, and remains the leading region. Europe and Central Asia began to surge in 2004, as European banks began to finance investments there associated with EU accession—but the proximity to these banks led to a severe cutback in investment with the onset of the global financial crisis in 2008. East Asia was a leading region in the early to mid-1990s, but has never fully recovered from the 1997 East Asian Crisis. Among all regions in terms of PPI investment, South Asia—led by massive PPI investments in India—has exhibited tremendous growth since the 1990s and captured second place among all regions in 2009 with regard to total PPI-related investment.

**Figure 2.2**

PPI Investment in Developing Countries, by Region, 1995-2009

Current US\$ millions



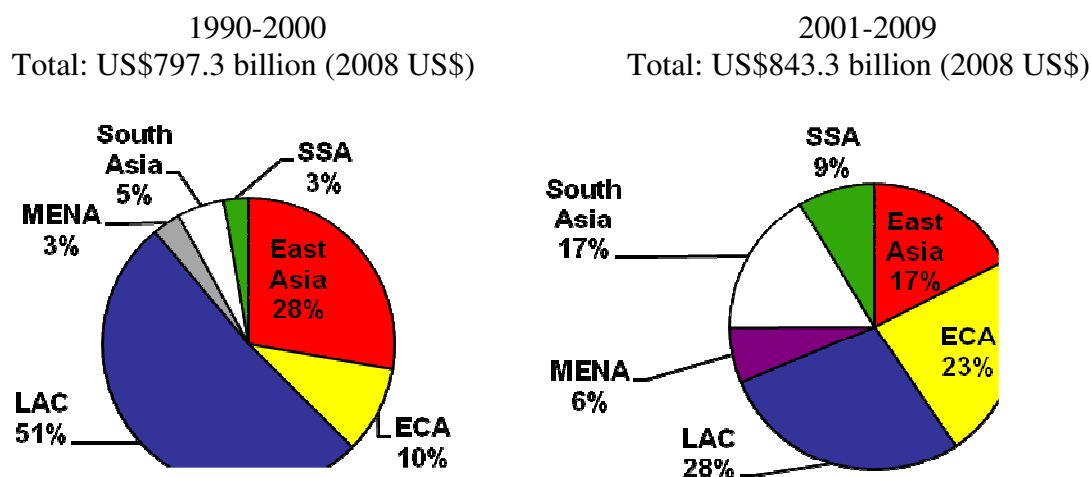
Source: World Bank and PPIAF, PPI Project Database

## 2.4 PPI in SSA

PPI objectives been very difficult to achieve in SSA, although at first glance it might seem that a more positive judgment is warranted. Sub-Saharan Africa has more than tripled its share of global PPI since the 1990s, making the region one of the world's most improved PPI performers over that period (figure 2.3).

**Figure 2.3**

PPI Growth in SSA Compared with Other Regions: 1990-2009



Source: World Bank and PPIAF, PPI Project Database

In addition, the AICD study found that the private sector already accounts for an impressive level of infrastructure investment in SSA, by contributing about 29 percent of total current capital spending – about a quarter less than the African public sector (38 percent), but more than the combination of ODA (15 percent) and flows from non-OECD countries like China, India, etc. (10 percent) (table 2.2).

**Table 2.2**

Sources of Annual Financial Flows to SSA Infrastructure

US\$ billions

Operations & Maintenance	Capital Investment						All Spending
	Public Sector Capex	Non-OECD Financiers	Official Development Assistance	Private Households	Private Sector	Total Capex	
20.4	9.3	2.4	3.7	2.1	7.3	24.8	45.2
Percentage of Total Capex	38%	10%	15%	8%	29%	100%	

Source: Foster and Briceño-Garmendia (2010).

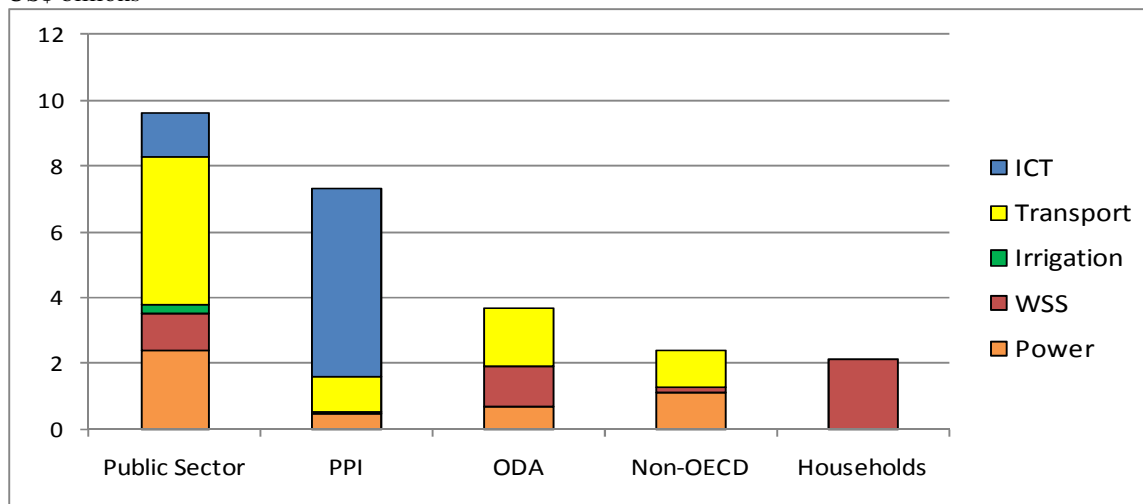
But the reality behind these statistics is somewhat less positive:

- First, the SSA capital investment total, plus the US\$20.4 billion a year spent by governments on O&M, is only about half of what is needed annually over a ten-year period for SSA to reach modest service delivery levels.
- Second, investment is also heavily skewed in terms of countries, with about 60 percent of total SSA PPI investment shared equally by just two countries, Nigeria and South Africa.
- Third, PPI is heavily skewed in terms of sectors, with 77 percent of SSA’s private investment since 2000 going to telecommunications (figure 2.4). The energy sector, arguably most in need of urgent major capital investment, attracts only 10 percent of PPI.

**Figure 2.4**

Sources of Current Infrastructure Investment in SSA, by Sector

US\$ billions



Source: Foster and Briceño-Garmendia (2010)

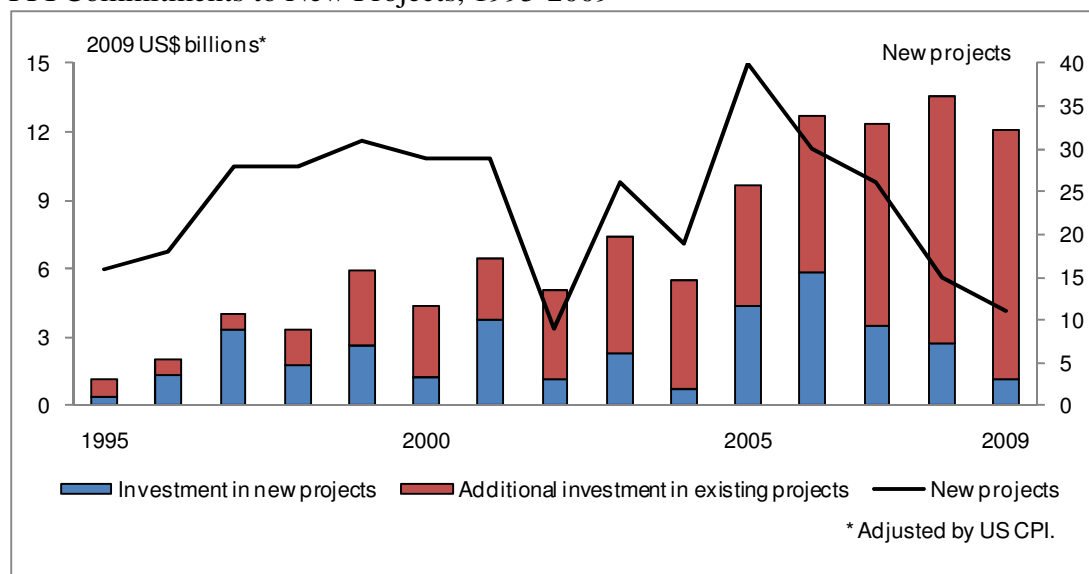
Some simple calculations illustrate the difficulties of completing PPI projects in SSA over the last decade: Starting with the 223 PPI projects reaching financial closure in SSA since 2000, then subtracting the telecom (merchant) projects (90) and the non-investment leases, management contracts and emergency rentals (43), leaves about ten PPI projects per year in water, transport and energy, with a grand total of approximately **four projects per year** located in countries other than Nigeria or South Africa. The PPI Database has registered only four regional PPI projects since 2000, involving ten countries (two in transport, two in energy transmission).

In contrast to SSA, the mostly middle-income countries of North Africa have used their stronger credit ratings to achieve significantly higher levels of PPI performance since 2000. Energy has played a larger role in infrastructure investment (17 percent vs. 10 percent in SSA), and telecoms a smaller role (63 percent vs. 77 percent in SSA). Again, subtracting telecom projects and management and lease contracts from the total number of PPI projects since 2000 (54), leaves 35 projects over this period, or about 3.5 per year shared by just five countries (compared with 4 projects per year shared by 46 SSA countries). In terms of total PPI investment, North Africa’s total represents about 45 percent of the total investment realized in SSA over the same period. The PPI Database has registered no regional PPI projects in North Africa since 2000.

The impacts of the 2007-08 global financial crisis on PPI in Africa are worth noting, if only because they underscore the fragility of these kinds of projects in SSA. Despite early optimism that Africa would be sheltered from the worst effects of the global crisis, the downturn seems to have severely impacted PPI in SSA. The impact of the crisis in SSA is clear from the sharp drop in the number of new projects and related investment in 2007 and 2008 (figure 2.5). As the financial crisis recedes, the SSA numbers have dropped to pre-1995 levels, with no signs of recovery apparent through 2010 (for more on the macro-economic factors that affect PPI projects, see Chapter 5).

**Figure 2.5**

PPI Commitments to New Projects, 1995-2009



Source: World Bank and PPIAF, PPI Project Database

## 2.5 Types of PPI Projects Used in Africa

As noted above, “private participation in infrastructure” (PPI) is defined by the PPI Project Database to include the full range of private involvement tracked by the database team, including divestitures and merchant projects. Using that data it is possible to construct a picture of the different types of PPP project structures used in Africa, while distinguishing them from non-PPP options like divestiture and merchant projects (table 2.3).

**Table 2.3**

Types of PPI Project Investments (and numbers of projects) in SSA, 2000-09

Sectors	PPPs:						Other PPI:				Totals	
	Brownfield Concessions		Greenfield Concessions		Mgmt/Lease Contracts		Divestiture (full/partial)		Merchant Projects			
	US\$ millions	No.	US\$ millions	No.	US\$ millions	No.	US\$ millions	No.	US\$ millions	No.	US\$ millions	No.
Telecom	0	0	575	5	0	2	5 423	18	25 210	69	31 207	94
Transport	5 423	46	4 307	5	36	3	4	2	10	1	9 780	57
Power	1 461	11	5 237	25	106	28	436	5	0	0	7 241	69
Water	31	1	121	1	12	13	0	0	0	0	164	15
Totals	6 916	58	10 239	36	154	46	5 863	25	25 220	70	48 392	235

Source: World Bank and PPIAF, PPI Project Database

Brownfield concessions. In contrast to their popularity in the early 1990s, brownfield concessions are associated with relatively little investment across all developing country categories since the Asian Crisis in 1997. This is true in SSA as well, although such projects continue to be used in Africa's transport sector (but much of the investment shown under this category in Table 2.3 actually comes from the governments or donors involved in these deals). These concessions involve the construction of some new infrastructure assets to improve or extend existing facilities, but mostly focus on rehabilitation. Theoretically such projects should be relatively easy to do because risks associated with initial financing and construction are largely reduced by the time a PPP contract is signed. But two other kinds of risks have made these projects unpopular with the private sector, especially in poor countries.

The first is the fact that assets are typically in very poor condition because of lack of maintenance. This risk is often compounded by the lack of reliable information about the condition of assets and the nature of the customer base (who the customers are, where they are located, which ones pay their bills, etc.). Private partners sometimes sign concession contracts and thereby agree to restore these distribution assets to good working condition, only to find out that deterioration was much worse than originally estimated. This poor condition means that rehabilitation is often so expensive that these costs cannot be recovered during the operation of the facility over the normal 20- to 30-years of a concession contract. Traditionally such contracts have included mechanisms to ensure that private partners are compensated for undepreciated asset values at the end of the concession period, but in poor countries potential private partners often question the willingness or ability of governments to make good on such long-term commitments. The emergence of new approaches to this problem has helped with some recent transport concessions, and may have application in other sectors, like energy (box 2.1).

A second kind of risk is the fact that brownfield concessions have traditionally been associated with the distribution of infrastructure services (mostly transport followed by water and sanitation) to end-users who pay for operating costs via fees. (Distribution systems are mostly in place for basic services, even in the developing world, and are operated by network utilities—to involve the private sector in the rehabilitation or extension of such systems, brownfield concessions are normally required.) Of the various transport subsectors, brownfield concessions have been most closely associated with toll roads. In the water sector, 80-90 percent of brownfield concessions involved distribution. But the inability or unwillingness of end-users to pay cost-reflective tariffs for these services, combined with the reluctance of regulators to allow such tariffs, helped make brownfield concessions the riskiest type of PPP during the 1990s. With the Asian Crisis, brownfield concessions went into the sharpest and longest decline of any PPP type.<sup>3</sup> In poor regions like SSA this has been particularly damaging given the extensive need for rehabilitation of poorly maintained existing assets, especially in the power sector.

Greenfield projects. The overall aversion to any risks associated with large investments in existing facilities in poor countries is reflected not only in the relatively small investments associated with divestitures and brownfield concessions in these countries, but also with relatively larger investments in greenfield and merchant projects. These projects involve the creation of new assets by private partners. As noted earlier, in developed markets these kinds of

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<sup>3</sup> For more on brownfield concessions, see Leigland (2008).



### **Box 2.1: Risk Mitigation Innovations in Brownfield Concessions**

The preparation of the Kenya-Uganda Railway Concession, which was signed in late 2006, involved an innovative mechanism to solve a long-standing problem with brownfield concessions of all types. If the approach on Kenya-Uganda rail works, it may have application to concession in other sectors, including energy.

At the time of contract closure, only a handful of railway concessions were in operation in Sub-Saharan Africa, and only two had been in operation for more than five years. One of the reasons why private investment is scarce in the African railway sector, and financial risk transfer to private operators rare even under these existing concessions, is because operators argue that track rehabilitation and renewal should be financed by governments. Their rationale is that the long life expectancy of these assets (often 40-50 years) makes it impossible for private companies to pay for them and recoup this investment over the 20-30 year life spans of normal concession agreements.

The traditional approach for dealing with this problem is for concessionaires to finance initial investment, with governments committing to compensate concessionaires for unamortized investment at the end of the concession period. But this approach has never been popular with operators because they question the willingness and/or ability of governments to make good on potentially large commitments made decades earlier by other officials no longer in government.

As a consequence of this perceived risk, concessionaires usually insist that governments also pay for some or all of the initial investment, if necessary by securing "soft" loans from donors or MDBs and on-lending these funds to concessionaires. Most new rail concessions in Africa are of this kind. In effect, governments are becoming financiers of their own concessions, raising questions about the extent to which they can also monitor contract compliance and effectively represent the rights of service beneficiaries. And because even under this newer approach governments must commit to make some end-of-contract payments if called for, the possibility exists that some private operators ultimately will manage the risk of government failure to make good on these commitments by slowing down privately-financed track rehabilitation and replacement toward the end of the concession period.

The Kenya-Uganda concession addressed this problem by adopting an approach never before used. The concessionaires were required to make the initial track investment, but the investment was protected with two related mechanisms.

First, a "conceded asset account" was created for all of the public assets associated with the concession. Assets handed over to the concessionaires were to be accounted for as concessionaire liabilities to the government and amortized accordingly. Newly acquired or improved assets, such a rolling stock, were to be amortized under the same account, but treated as credits to the concessionaires. By independently auditing the account frequently, the amortization of these investments could be monitored, and the added value by the concessionaires assessed. This conceded asset account was designed to be the basis on which the accounts between the concessionaires and the governments could be reconciled whenever the concession contract was terminated, or upon its natural expiration.

Second, government's willingness and ability to make good on obligations relating to this conceded assets account were supported by two separate IDA Partial Risk Guarantees (PRGs). These were guarantees to the respective concession companies—US\$30 million for RVR-Kenya and US\$15 million for RVR-Uganda. The PRGs would be triggered by the failure of either government to meet its contract termination payment obligations relating to the Conceded Asset Accounts (or failure to pay any liquidated damages). In other words, the concession contract was structured so that any breach of contract terms by any party potentially would lead to contract termination, which in turn would lead to a requirement to make good on any obligation documented in the conceded asset account. In the case of a government obligation to pay, such an obligation was backed by the PRG.

This combination of mechanisms had never before been structured into a long-term infrastructure concession contract, much less a transport project. They played an important role in maintaining investor interest during the bidding process, attracting lenders to the deal (including both commercial banks and MDBs), and shifting project risk to the private operator. Exactly the same problem limits the private investments associated with brownfield concessions in the power sector. These kinds of risk mitigation mechanisms may prove useful in that sector as well.

projects are considered more risky because of uncertainties regarding construction, licensing, operation, etc. But greenfield and merchant projects represent lower risks for private partners in poor countries because the partners better understand the assets they will be in control of, and know that the assets will normally not need massive unanticipated investment. Accordingly, greenfield and merchant projects account for a much larger share of all PPI investments in low-income regions like SSA than they do in middle-income regions.

Management and lease contracts. These arrangements tend to be short term and involve little or no capital investment by the private partner. But such projects continue to be used because they can help reduce inefficiencies in the operation of infrastructure services. They also involve lower levels of risk for private partners than other forms of PPI, and are more attractive to such partners in risky sectors such as water or power distribution, where tariff regulation and customer willingness and ability to pay for services can be serious problems. Today, governments and donors are sometimes willing to divide up projects that would have been done in the early 1990s as traditional brownfield concessions, with private companies taking on operations and maintenance via management contracts and governments taking on financing of investment (with donor help). Although management contracts have been shown to improve operating efficiency, targeting of benefits is sometimes a problem and highly-paid, foreign private operators sometimes become scapegoats for broader sectoral problems caused by poor government planning and lack of investment (things that management contractors are usually not responsible for). Governments in Africa have often refused to renew such contracts once their initial terms have been completed because although the contracts are introduced with great fanfare, they fail to solve the most glaring problems in a sector.

Merchant projects. Merchant projects overwhelmingly dominate PPI financing of African infrastructure, accounting for almost 65 percent of total new investment since 2000 (table 2.3). Unlike some other regions where a portion of merchant-related investment has gone to the power section, all such investment in SSA has been in telecommunications. (The percentage of total investment attributable to merchant projects is about half this high in non-African middle-income countries.) A merchant project involves construction of a new facility, but unlike a traditional greenfield concession there is no on-going public-private risk-sharing relationship formalized in a contract (and therefore merchant projects are not classified as PPPs in this study). The private developer assumes the construction, operating, and market risk for the project, but by the same token normally does not share the project rewards—concession fees are not paid to the government. Such projects are particularly attractive to private partners in robust, liberalized markets where the government provides no revenue guarantees, but also does not regulate prices. The role of government in such projects is usually limited to licensing.

The popularity of this type of project was only slightly affected by the Asian Crisis and has proved to be far more resilient than any other form of PPI arrangement. This is not particularly surprising considering the fact that such projects involve conventional private investment, unregulated tariff structures, and do not rely for sustainability on government-implemented risk mitigation mechanisms such as off-take agreements and project revenue guarantees. Thus the wide-spread failure of such risk mitigation measures during the Asian Crisis had little impact on merchant projects.

Divestiture. Divestiture accounts for only about 12 percent of infrastructure investment in the SSA region, almost all of it in telecommunications (table 2.3). In contrast, divestiture in predominantly middle-income regions like East Asia or Latin America includes a significant share in energy (up to 40 percent) in addition to telecommunications. These middle income regions register up to eight times more investment via divestiture than does SSA. That low-income regions would make much less use of divestiture than middle-income regions is not surprising. As noted above, infrastructure assets in the poorest countries are usually less well maintained than those in more affluent countries, incentivizing investors to minimize exposure to risks associated with those assets. This translates into much less investor interest in buying existing assets in African countries, or taking control of them via brownfield concessions.

Divestitures, like merchant projects, are not usually classified as public-private partnerships because they also lack on-going risk-sharing relationships formalized in contracts. But partial divestiture implies continuation of some government ownership and often a retention of some control. As such, partial divestiture represents an ongoing, risk-sharing relationship between public and private partners and has long been viewed as a low-risk alternative to brownfield concessions, because it is another widely-used way of involving the private sector in investment and management of existing facilities that remain to some extent under governmental ownership and control. This is particularly true in partial share sales to strategic equity partners. About 78 percent of divestiture-related investment in SSA comes via partial divestiture. This is not dramatically different from the percentages in other developing country regions.

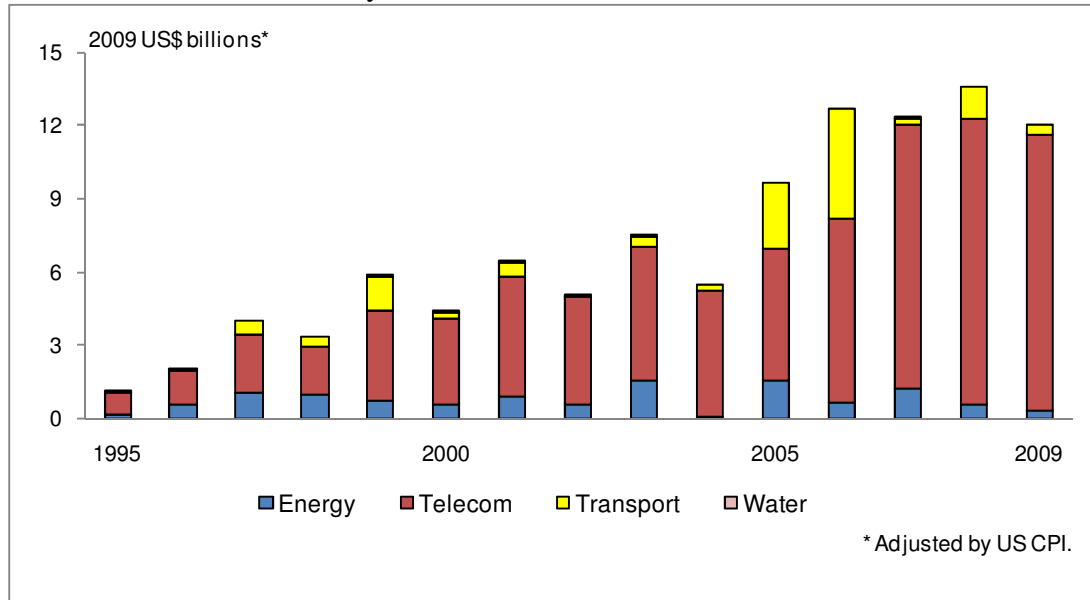
## **2.6 PPI in Telecommunications, Transport, and Water**

The focus of this paper is on PPI projects in SSA's energy sector, and this topic will be the focus of the next chapter. But it seems reasonable to assume that some of the lessons learned in the other infrastructure sectors might be usefully applied to energy. Accordingly, this section reviews Africa's PPI experience in telecommunications, transport, and water supply and sanitation.

Telecommunications: The telecommunications sector has attracted by far the largest amount of private investment in SSA over the last decade (76 percent of the total), with 97 projects in 37 countries, and US\$60 billion in investments. Additional investment in projects initiated during the 1990s accounted for 47 percent of this total (figure 2.6). It is also likely that the "flight to quality" associated with the global financial crisis may have even further driven up telecom investment in Africa as a percentage of total infrastructure investment from 2007-09, and reduced shares going to transport and energy.

**Figure 2.6**

PPI Commitments in SSA by Sector, 1995-2009



Source: World Bank and PPIAF, PPI Project Database

Over 98 percent of the PPI investment in telecommunications came via merchant projects or divestiture of telecom companies—in other words, non-PPP arrangements that do not involve contractual risk-sharing agreements between public and private partners. Merchant projects have no need for project preparation or procurement by government. In the IT sector they typically involve robust revenue streams, even in poor countries, because they are often secured by prepayment systems. They involve relatively inexpensive, mass produced technology, relatively low capital costs, and most benefit from unregulated tariffs.

The growing prevalence of merchant projects in this sector is consistent with a global trend involving the decreasing frequency of traditional PPP arrangements (especially greenfield or brownfield concessions) in the ICT sectors of emerging market economies. Many sector experts consider this to be a positive development. PPPs were once the only vehicle legally available to facilitate private sector participation in countries that allowed only state-owned telecommunication operations. But it has become increasingly clear that there is little benefit from state ownership or operation of ICT service providers. PPPs in the sector are increasingly seen to be inconsistent with the promotion of liberalized ICT markets and competitively-neutral regulation and policies.

There are indeed situations in Africa where it makes sense to use ICT PPPs, for example where there is a need to promote universal service coverage for various ICT services that private firms are reluctant to fully finance. But generally speaking, the role of PPPs in the telecom sector should continue to decline as the challenge of harnessing private sector resources in a cost-effective fashion becomes less of a matter of government involvement in PPPs and more a matter of better planning, policy and regulation to stimulate competition among private service providers by increasing the number of mobile operators and liberalizing access to international gateways.

Transportation: From 2000-09, 57 transport projects were concluded in 19 SSA countries. Investments in these projects, plus projects that were initiated prior to 2000, totaled US\$10.8 billion. This represents about 14 percent of total infrastructure investment in SSA over this period, making transport the second most active PPI sector after telecommunications.

Seaport container handling concessions dominated the activity in this sector and have recorded substantial successes—these are probably the most viable non-telecom PPPs in Africa. Over the 2000-09 period, 27 seaport projects were concluded, accounting for US\$4.2 billion in investment. Ports are relatively attractive targets for PPI because of their ability to generate hard currency revenues. The landlord port model, now generally regarded as the preferred PPI model for the sector, has only been used in Ghana and Nigeria, with other models used elsewhere. Nevertheless, PPI of one kind or another is widespread in the port sector. Cancelled or distressed projects are relatively rare, and performance improvements have been the norm, particularly with concessioning of container terminals.

Rail concessions have been reasonably popular, and more are planned—12 were completed over the 2000-09 period. In part, the proliferation of these projects since the early 1990s seems to result from increased competition for profitable freight services with newly deregulated road transport. Railways were often left with enough revenues to cover operating costs, but not to renew stock. Rail concessions have often been used to maintain the facilities and generate more fee income (often paid by the concessionaire to the government), so that governments could finance improvements and upgrades. But they typically involve little private investment in rail or rolling stock, because operators feel that it is highly unlikely they will be fully compensated for undepreciated assets at the end of the concession period. This is a typical problem associated with investments in assets that have a 50-year life span, pursuant to 20-30 year concession agreements in poor countries. But as noted earlier in this chapter the problem has been addressed recently on some rail projects in ways that might help with brownfield concession in other sectors, like energy (box 2.1). In the meantime however most of the long-term capital investments associated with African rail concessions will continue to be financed by governments with the help of donors or MDBs.

The development of toll roads in Africa is limited by a lack of vehicular traffic, except in South Africa and a few other transport corridors. AICD estimates that only 7-8 percent of the total continental road network has the traffic density to support the development of traditional user-pay toll roads. Only three road PPPs were registered over the 2000-09 period. Of course, drivers do not have to pay directly for the use of roads; governments can pay via shadow tolls or other mechanisms. But most SSA governments do not have the resources to take on such liabilities.

Water and sanitation: From 2000-09, 15 water and sanitation projects were concluded in 13 SSA countries. Investments in these projects, plus projects that were initiated prior to 2000, totaled US\$179 million, making this sector by far the least active in terms of private participation (accounting for just 0.23 percent of total infrastructure investment in the region).

Eleven management or lease contracts were concluded for water and sewerage utilities, and two for sewage treatment plants. These projects generated negligible capital investment. A brownfield concession was completed for a water utility in South Africa (US\$31 million) and a greenfield concession was completed for a water treatment plant in Sudan (US\$121 million).

Traditional brownfield concessions in the water sector, involving substantial private investment, have rarely been attempted in low-income countries in the decade following the Asian Crisis. But greenfield concessions and management or lease contracts that aim at operational efficiency and service quality rather than private investment seem to be gaining reputations for modest levels of success (Marin, 2009). Investment is often associated with management or lease contracts, but usually is paid for with government and donor funding, as in the case of the *affermage* contracts in West Africa (where investment is implemented by government asset holding companies), or from annual cash flows, as in projects in Mali and Cote d'Ivoire. But these efforts to lower private partner risks with non-investment PPPs do not protect these projects from problems.

Of all the infrastructure sectors, water and sanitation has proved to be the most difficult for PPI. This is especially true in African countries. It is likely that government ownership, financing, and even management will remain the norm in these countries for the foreseeable future.

## **3. PPI in SSA's Power Sector**

### **3.1 Overview**

As noted in the introduction to this paper, energy plays a critical, central role in economic development and poverty reduction. This chapter focuses on the extent to which PPI can and does make a contribution to the huge needs for investment and efficiency gains in Africa's energy sector. Investment needs in the sector are quantified, the performance of PPI in other regions is assessed as a way of gauging best practice, and PPI in Africa's energy sector is evaluated against that backdrop. The following topics are discussed in this chapter:

- The Multi-dimensional Problems in SSA's Power Sector
- Investment Needs Quantified
- Best Practice: The PPI Contribution to Power Sectors of Other Regions
- PPI Performance in SSA's Power Sector
- Challenges Associated with PPI Project Types

This chapter concludes that, although as much as 60 percent of Africa's total infrastructure investment needs are in the energy sector, PPI plays only a marginal role in meeting those needs. Only about 10 percent of all PPI investment in Africa has gone into the energy sector over the last ten years. If all new PPI investment (in all sectors) in 2009 were diverted into energy, it would contribute only about half of what is needed to meet capital investment needs in the sector on an annual basis.

This chapter concludes with a detailed discussion of the problems experienced in Africa with the types of PPI projects described in Chapter 2. Perhaps the most glaring shortcoming is the almost total absence of PPI projects involving generation of hydropower—by far the largest untapped source of energy on the continent.

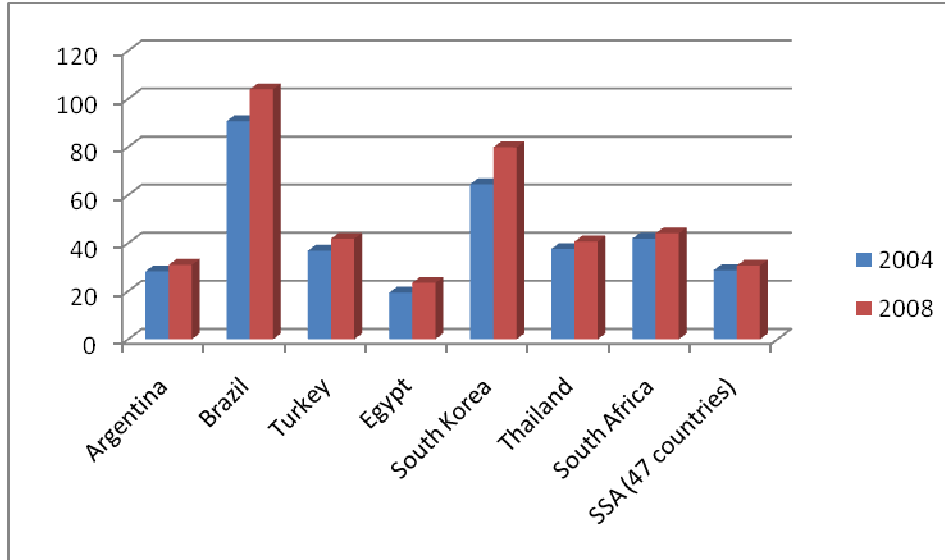
### **3.2 The Multi-dimensional Problems in SSA's Power Sector**

Recent data from sources such as the U.S. Energy Information Administration (EIA), confirm AICD's conclusions about massive, multi-dimensional problems in SSA's energy sector, which were summarized in the introduction to this paper.

For example, EIA data allow a comparison of the installed electricity generating capacity in South Africa, the rest of SSA, and several other developing countries chosen more or less at random (figure 3.1). The total installed capacity of the 47 countries in SSA (excluding South Africa) is about equal to that of Argentina, and somewhat less than countries like Turkey and Thailand (as well as South Africa), less than half the capacity of a country like South Korea, and barely 20 percent of a country like Brazil.

**Figure 3.1**

Total Electricity Installed Capacity in Africa and Selected Countries (Gigawatts)

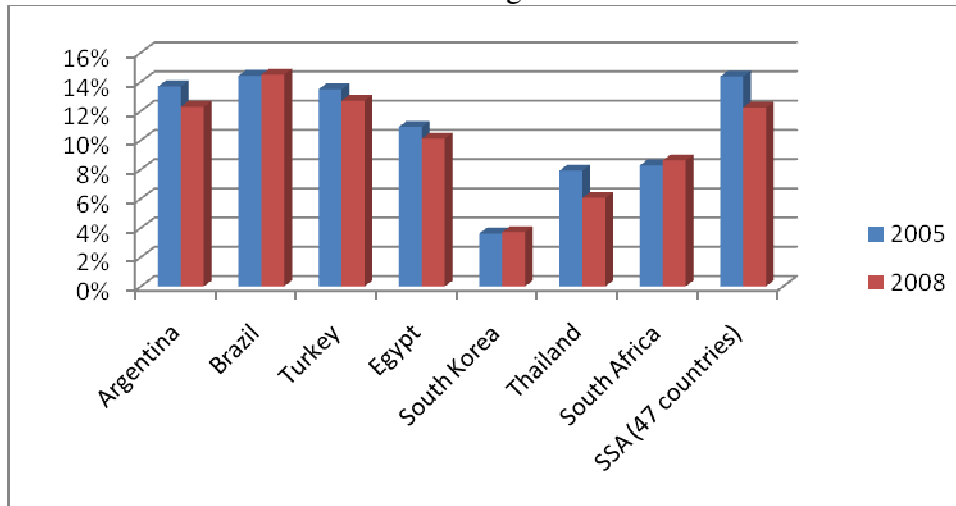


Source: EIA

At the same time, SSA (excluding South Africa) performs poorly in a comparison of these same countries regarding total distribution losses as a percentage of total generation from 2005 to 2008 (figure 3.2). The 47 countries of SSA rank near the top of these measures, although some progress has been achieved since 2005.

**Figure 3.2**

Total Distribution Losses as a Percentage of Total Generation



Source: EIA

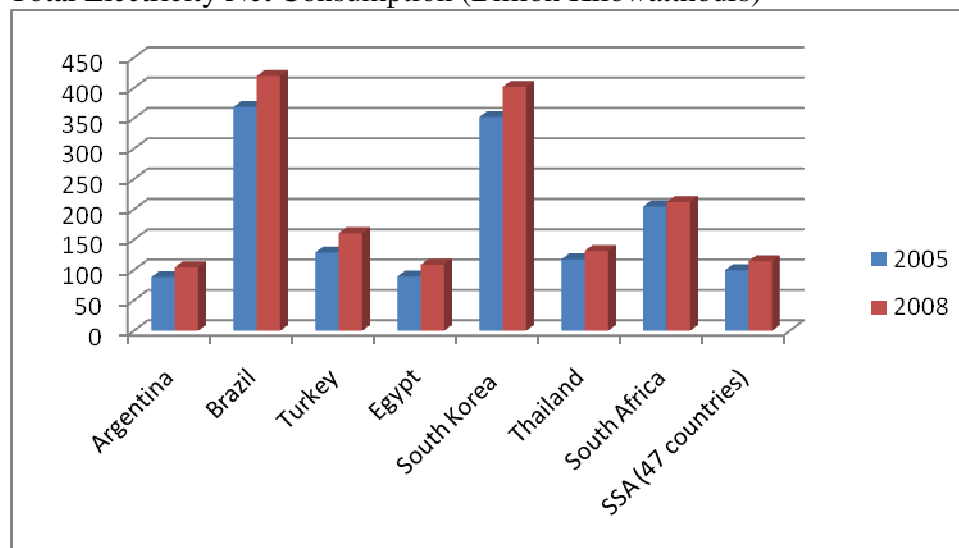
Finally, EIA figures confirm that by 2008, electricity consumption in the 47 countries of SSA (population of 723 million) remained extremely low, about half that of South Africa (population of 47 million) (figure 3.3). The rate of growth in SSA over this three-year period (15 percent)



was also considerably lower than in Argentina (18 percent), Turkey (25 percent), and Egypt (22 percent).

**Figure 3.3**

Total Electricity Net Consumption (Billion Kilowatthours)\*



\*Consumption of electricity computed as generation, plus imports, minus exports, minus transmission and distribution losses.

Source: EIA

### 3.3 Consequences of Deficient Power Infrastructure

Efforts to promote economic growth and reduce poverty depend on adequate supplies of services like water supply, transportation, health, education, communications, as well as energy. Each of these service sectors contributes to development and generally speaking the more of each, the more development is generated. But not all sectors are developed at the same pace. As subsequent sections of this paper illustrate, the transport sector attracts about 83 percent more capital investment than does the energy sector, despite the fact that investment in energy is massively underfunded, but investment in transport is not. It is true that energy supply competes with these other services for the allocation of scarce capital and scarce opportunities for policy and institutional reform. But African policy makers need to be aware that increased energy availability disproportionately stimulates development by having a multiplier effect on the productivity of other service sectors – more than they increase the productivity of energy (Toman and Jemelkova, 2002). Energy availability and reliability can help in the following ways:

- Increase the productivity of education (literacy, school completion rates, etc.) by allowing reading when there is no natural light;
- Facilitate the use of more modern machinery and techniques, for example in manufacturing, that increase the productivity of workers;
- Facilitate sharp increases in farm productivity through electrified pump irrigation;
- Increase the productivity of workers and enterprises by extend the length of the workday;
- Improve health, particularly of workers, by improving the quality of indoor air;

- Reallocate capital tied up in providing energy service redundancy via backup generators;
- Improve the storage of medicine;
- Promote better access to safe drinking water (deeper wells, more reliable, larger-scale water treatment);
- Facilitate the use of refrigeration and thereby reduce food-borne illnesses, lower the costs of food production and make it easier for subsistence households to meet and go beyond basic dietary requirements;
- Enhance investments in road networks by facilitating the wider availability of transport fueling;
- Improve the use of information technology (radios, televisions, computers, and other electronic devices);
- Reallocate household time (especially by women) from energy provision to improved education, income generation (e.g., via animal husbandry, microenterprise, etc.), and greater specialization of economic functions;
- Generally improve quality of life through better health, less drudgery, more leisure, greater communication opportunities, and increased social status.

With power infrastructure as deficient as it is in SSA, the region faces not just a power crisis, but a massive, much broader development crisis as well.

### 3.4 Energy Sector Investment Needs Quantified

AICD estimates the annual infrastructure spending needs in SSA for the ten-year period leading up to 2015. The needs are based on what is required to (i) address the region's infrastructure backlog, (ii) keep pace with the demands of economic growth, and (iii) attain a number of key social targets for broader infrastructure access. The latter two target categories, involving economic and social factors, are modest compared with achievements already realized in other regions, but ambitious in terms of SSA's starting point (Foster and Briceño-Garmendia, 2010):

- AICD Economic Targets:
  - ✓ Attain demand-supply balance in power production...
  - ✓ by developing 7,000 MW of new generation capacity annually...
  - ✓ within a regional framework entailing 22,000 MW of new cross-border interconnection.
- AICD Social Targets:
  - ✓ Raise household electrification rate by about 10 percentage points over current levels...
  - ✓ entailing an additional 57 million new household connections.

Existing annual spending on infrastructure is also estimated by AICD, and the annual spending gap—what is needed over and above existing spending—is the result of subtracting current spending from the total needed (table 3.1). The funding gap in the power sector is by far the largest of any infrastructure sector, representing over 60 percent of all infrastructure funding needs.

**Table 3.1**

## SSA's Annual Infrastructure Funding Gap

US\$ billions

	Electricity	ICT	Irrigation	Transport	WSS	TOTAL
Spending needs	40.8	9.0	3.4	18.2	21.9	<b>93.3</b>
O&M	14.1	2.0	0.6	8.8	7.0	33.0
Capex	26.7	7.0	2.7	9.4	14.9	60.4
Existing spending	11.6	9.0	0.9	16.2	7.6	<b>45.3</b>
O&M	7.0	2.0	0.6	7.8	3.1	20.4
Capex	4.6	7.0	0.3	8.4	4.5	24.9
Funding Gap	29.2	0.0	2.5	2.0	14.3	<b>48.0</b>
O&M	7.1	0.0	0.0	1.0	3.9	12.6
Capex	22.1	0.0	2.4	1.0	10.4	35.5

Percentage of Total Funding Gap	61%	0%	5%	4%	30%	100%
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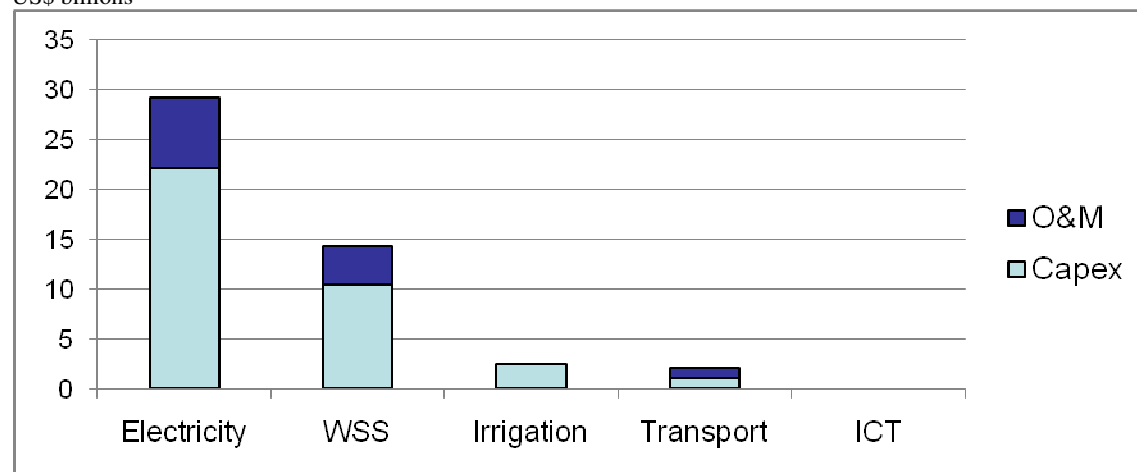
Source: Foster and Briceño-Garmendia (2010)

Looked at from a slightly different perspective, the capital investment needs alone of the power sector are larger than all funding needs (operations, maintenance, and capital investment) in all the other sectors combined (figure 3.4).

**Figure 3.4**

## Annual SSA Infrastructure Sector Funding Gaps

US\$ billions



Source: World Bank and PPIAF, PPI Project Database

It is worth remembering that the infrastructure funding gaps will impact different kinds of African countries in different ways, particularly if the size of a country's GDP is taken into account (table 3.2).

**Table 3.2**  
Annual Power Sector Funding Gap by SSA Country Type

Country Category	Capex Gap	O&M Gap	Total Gap
	Percentage of GDP		
Middle-Income country	2.0	1.9	3.9
Resource rich country	1.6	0.5	2.0
Low-Income country - nonfragile	4.1	0.1	4.2
Low-Income country - fragile	6.9	0.2	7.1
Totals	2.7	0.9	3.6

Source: Foster and Briceño-Garmendia (2010)

- Middle income countries (MICs) are those classified as such on the OECD's DAC List of countries eligible for official development assistance. These countries, like South Africa, Botswana, and Cape Verde, constitute a relatively small minority of African nations. Although they account for almost half of the total power sector funding gap in SSA, this translates into a lower share of GDP than in the case of many Low-Income countries (LICs).
- Resource rich countries are those that can depend heavily on revenues from generous endowments of natural resources like minerals and petroleum. AICD classifies a country as resource rich if its primary commodity revenues exceed 10 percent of GDP. Gabon is the single African MIC classified in this category; the rest are LICs. These countries face the lowest annual power sector funding gap of any country category, when the gap is measured in terms of percentage of GDP.
- Low-income non-fragile countries are those classified as LICs on the OECD DAC List (GDP per capital less than US\$745). Examples include Ethiopia, Uganda, and Senegal. In dollar terms, these countries face a slightly higher power sector financing gap than their resource rich counterparts, but the share of GDP involved is over twice as much.
- Low-income fragile countries are those LICs that face development challenges because of conflict, weak governance, and/or limited administrative capacity. Fourteen SSA countries fall into this category. They include Ivory Coast, DRC, and Sudan. These countries face the smallest annual power sector funding gap in dollar terms, but by far the largest in terms of GDP share. In fact, combined with other infrastructure financing needs, these countries cannot realistically be expected to meet AICD's ten-year economic and social targets.

Finally, in what geographical areas is power sector investment needed most in Africa? AICD calculates this based on the power development plans and investment needs assessments of the various power pools across the continent (table 3.3). West Africa requires most of its new investment in transmission and distribution. Southern Africa, with the by far largest total investment needs, requires most of it in power generation.

**Table 3.3**  
Where Annual Investment in SSA's Power Sector is Needed

US\$ billions annually

Types of Investment	Central African Power Pool	Eastern African Power Pool*	Southern African Power Pool	Western African Power Pool	Island States	Totals
Investment:						
Rehabilitation	0.1	0.3	2.6	1.0	0.0	<b>4.0</b>
New generaion	0.9	3.5	4.5	3.5	0.1	<b>12.5</b>
New transmission & distribution	0.3	3.0	2.9	3.7	0.2	<b>10.1</b>
Total investment	1.3	6.8	10.0	8.2	0.3	<b>26.6</b>
Operations & maintenance	0.2	1.1	8.4	4.0	0.3	<b>14.0</b>
Total annual spending needs	1.4	7.9	18.4	12.3	0.6	<b>40.6</b>

\*Including Nile basin, but excluding Egypt

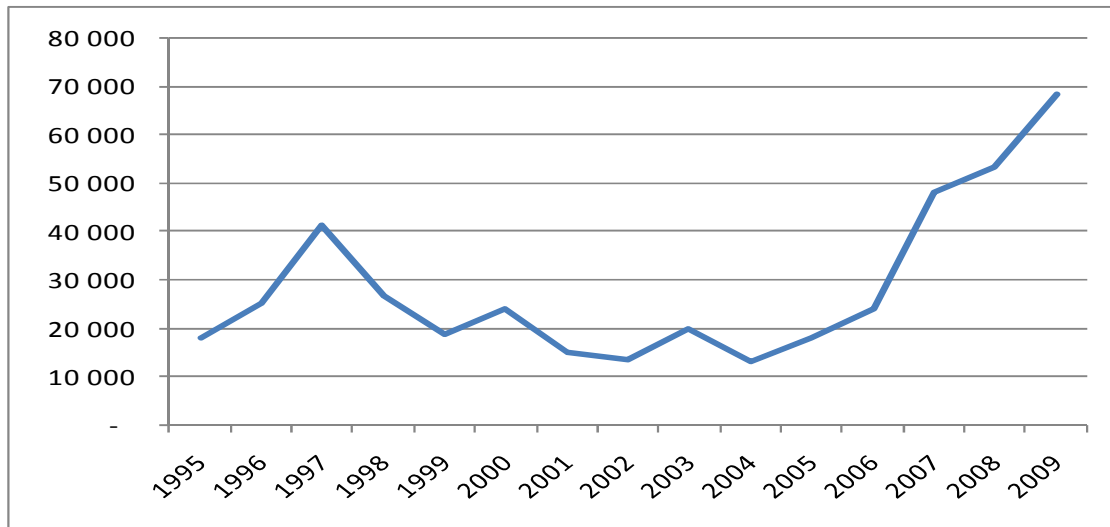
Source: Foster and Briceño-Garmendia (2010)

### 3.5 Best Practice: The PPI Contribution to Power Sectors of Other Regions

PPI-related power investment in all developing countries has gone through roughly four phases since the beginnings of the PPI boom in the early 1990s (figure 3.5).

The first phase was marked by tremendous growth in the early 1990s, driven largely by the rapidly expanding numbers of IPP projects. From 1992-97 the energy sector attracted more PPI investment than any other sector, including telecommunication. By mid-1998, 73 developing countries had begun taking steps to introduce private participation in their power sectors. A year later, 600 power projects of various kinds were in preparation.

**Figure 3.5**  
PPI Investment in Power, all Regions, 1995-2009  
Current US\$ millions



Source: World Bank and PPIAF, PPI Project Database

But as the Asian Crisis began to unfold in 1997, PPI in power began a dramatic second phase—a precipitous decline that would last for about five years. A host of events helped accelerate the departure of private power investors from these emerging markets, including the collapse of Indonesia’s IPP sector, the spectacular implosion of large individual projects (like the Dabhol project in India and the Hub project in Pakistan), as well as exogenous factors like the Enron corporate scandal and the domestic recession in the U.S.

The market then began a third phase as it stabilized over the 2001-05 period. Total investment ranged from US\$11-16 billion during this period. The average annual number of power projects during this period fell to about half that of the late 1990s, and the average project size declined sharply as well. In 2002, average power project size was about US\$166 million compared with US\$360 million in 1997.

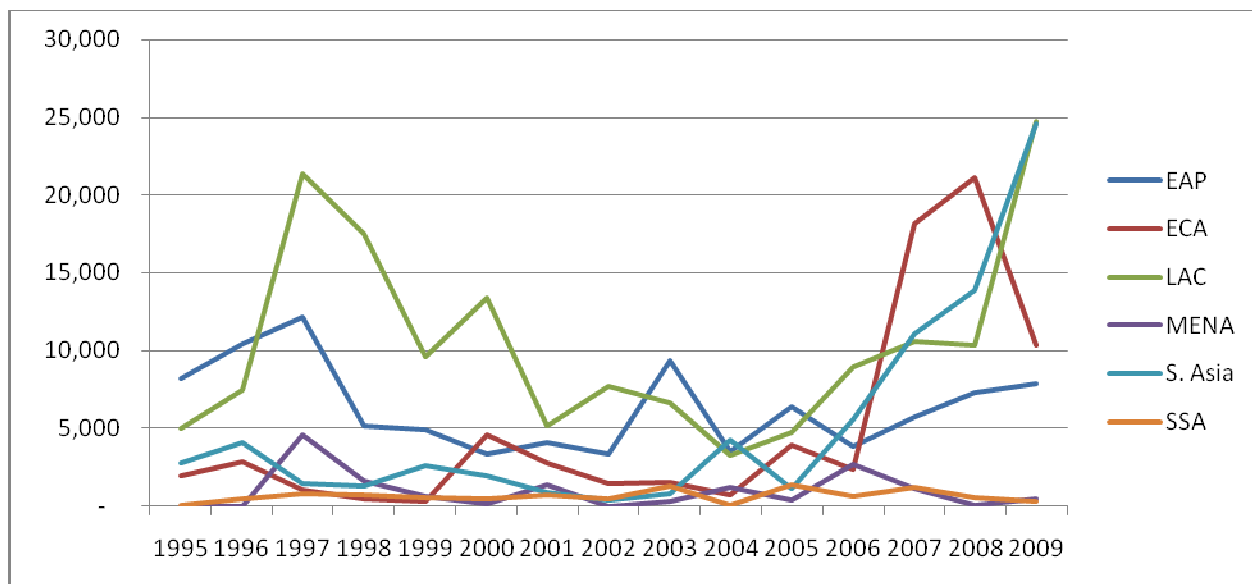
But by 2005, PPI investment in power entered a fourth phase as it began to grow sharply once again. In fact, this growth (which has continued through 2010) demonstrates stronger recovery than the overall PPI market. By 2007, PPI in power had exceeded in real terms the previous high in 1997, and continued to grow, showing none of the leveling off in response to the global financial crisis that is evident in the overall market.

In 2009, energy was the only sector in which PPI investment increased. Driven by the closure of huge power projects in Latin America and South Asia (figure 3.6), total investment reached US\$68.5 billion, its highest total ever and 45 percent of all PPI investment in 2009. This was also the first year since 1997 that energy investment led all other sectors, including telecommunications.

### Figure 3.6

PPI Investment in Power, by Region, 1995-2009

Current US\$ millions



Source: World Bank and PPIAF, PPI Project Database

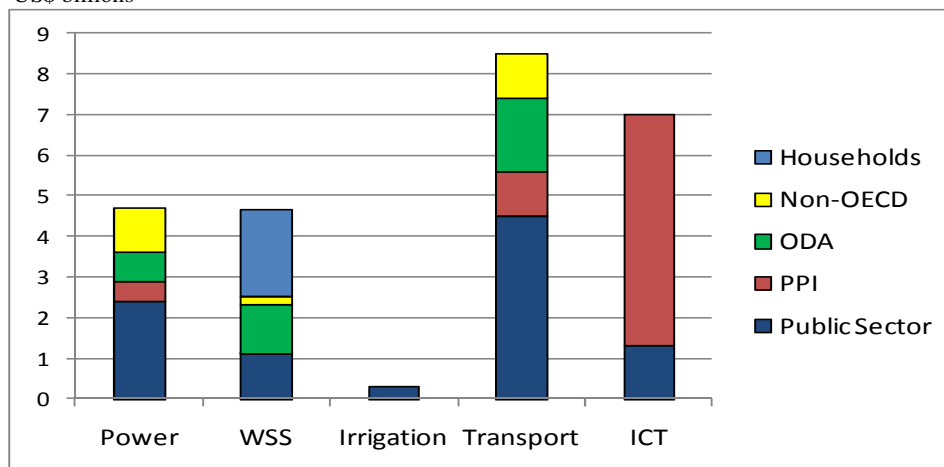
### 3.6 PPI Investment in SSA's Power Sector

As noted earlier (table 3.1), current capital investment in SSA's power sector (from all sources) is about US\$4.6 billion per year, far less than the US\$26.7 billion needed to meet AICD's ten-year power sector development goals. The private sector contributes relatively little to that current total, particularly when compared with private investment in other sectors (figure 3.7).

**Figure 3.7**

Sources of Current Annual Capital Investment in SSA's Infrastructure Sectors

US\$ billions



Source: Foster and Briceño-Garmendia (2010)

From 2000-09, 69 energy projects were concluded in 27 SSA countries (table 3.4).

**Table 3.4**

## New PPI Projects in SSA's Energy Sector, 2000-09

	PPPs:						Other PPI:				Totals	
	Brownfield Concessions		Greenfield Concessions		Mgmt/Lease/Rental Contracts*		Divestiture (full/partial)		Merchant Projects			
	US\$ millions	No.	US\$ millions	No.	US\$ millions	No.	US\$ millions	No.	US\$ millions	No.	US\$ millions	No.
<b>Electricity:</b>												
Generation	395	4	3 042	20	105	20	420	4	-	0	3 962	48
Distribution, transmission & generation	909	3	-	0	-	6	-	0	-	0	-	9
Distribution & generation	74	2	-	0	-	0	-	0	-	0	74	2
Distribution & transmission	-	1	-	0	-	1	-	0	-	0	-	2
Distribution	84	1	-	0	1	1	-	0	-	0	85	2
<b>Natural Gas:</b>												
Distribution	-	0	55	1	-	0	16	1	-	0	71	2
Distribution & transmission	-	0	1 234	2	-	0	-	0	-	0	1 234	2
Transmission	-	0	906	2	-	0	-	0	-	0	906	2
<b>Totals</b>	<b>1 461</b>	<b>11</b>	<b>5 237</b>	<b>25</b>	<b>106</b>	<b>28</b>	<b>436</b>	<b>5</b>	<b>-</b>	<b>0</b>	<b>7 240</b>	<b>69</b>

\*Includes 19 rental contracts for generation

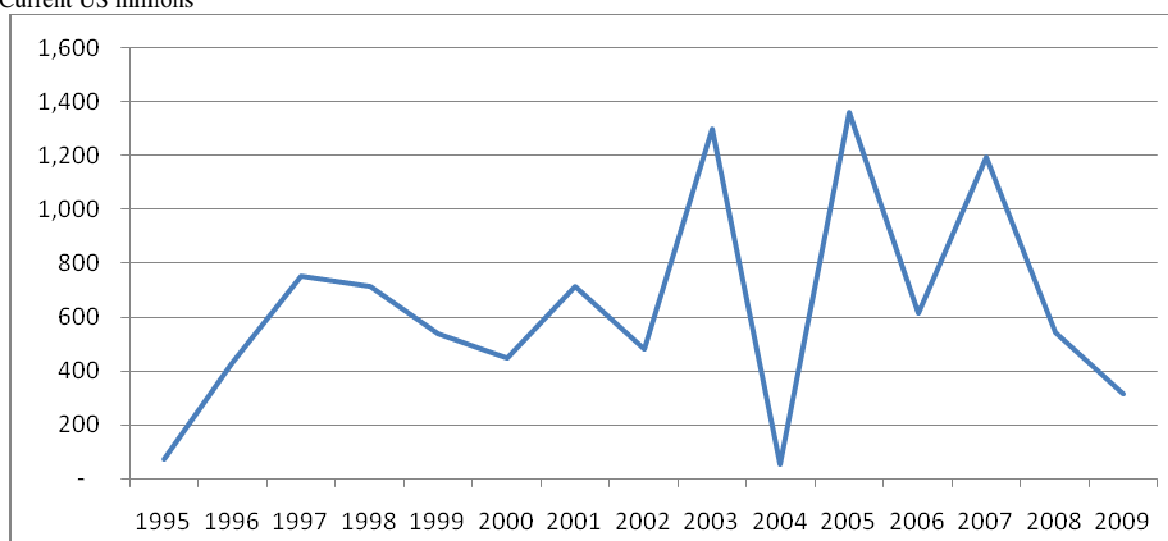
Source: World Bank and PPIAF, PPI Project Database

Investments in these projects, plus projects that were initiated prior to 2000 represents about 10 percent of total PPI investment in SSA over this period. These low levels of investment have contributed to an erratic investment profile over the 1995-09 period, as infrequent, relatively large investments in individual projects have had inordinate impacts on the overall market (figure 3.8).

**Figure 3.8**

### PPI Investment in SSA's Power Sector, 1995-2009

Current US millions



Source: World Bank and PPIAF, PPI Project Database

### 3.7 Challenges Associated with PPI Project Types Used in SSA's Power Sector

The investment performance of the various PPI project types used in SSA's power sector is quite modest, particularly when compared with other regions. Each project type has particular challenges that need to be addressed if private participation is going to play a more productive role in the sector. This section reviews the main project types, their traditional shortcomings, as well as some potential solutions to these problems (table 3.5).

**Table 3.5**



## Problems with the Use of PPI Project Types in SSA's Power Sector

PPI Project Type	Performance since 2000	Problems & Challenges	Possible Remedies
IPPs	20 projects	Small markets, costly power, uncreditworthy off-takers expensive to prepare	Larger, regional projects under PIDA sponsorship
Hydro IPPs	2 projects	Very expensive, risky and controversial, preparation costs very high	Larger, regional projects under PIDA sponsorship
Distribution Concessions	7 projects	Large investment needs relative to revenue, govt regulation of tariffs	Political risk insurance, partial risk guarantees, conceded asset accounts
Management Contracts	9 projects	Costly to structure, hard to get incentives right, dependent on broader sector reforms	Include customer care in incentive structure, find more local partners
Divestiture	5 projects	Assets often in poor condition, few functioning share markets	Refurbish and maintain assets
Merchant Projects	No projects	African power markets are not liberalized	Broad sector reform

Source: Author's compilation.

**Generation.** Since 2000, electricity generation accounted for most of SSA's PPI investment activity, with 48 new projects, US\$4.5 billion in investment (including investment in projects initiated before 2000), and 6,620 MW of generating capacity. Most of these were greenfield projects, but 19 were power plant rental contracts entered into to secure short-term, expensive generating capacity needed to cope with power emergencies.

SSA's limited ability to use private investment to keep power generating capacity growth in line with GDP growth is one of the reasons why Africa's power sector is so different in size from those of other developing country regions. PPI investment levels and numbers of projects have fallen far behind those of other regions that were at roughly similar stages of development 30 years ago. SSA's generating capacity per million people was roughly at the same level as South Asia in 1980, but the gap has widened significantly, particularly since South Asia began using PPI mechanisms in the early 1990s (table 3.6).

**Table 3.6**  
SSA vs. S. Asia – PPI Energy Sector Projects, 1995-07

<b>SSA</b>				<b>South Asia</b>			
PPI Projects in SSA's Energy Sector - 1995-07				PPI Projects in SA's Energy Sector - 1995-07			
(Numbers of projects by PPI type)				(Numbers of projects by PPI type)			
	Generation only	Distribution (& transmission)	Combined functions	Generation only	Distribution (& transmission)	Combined functions	
Brownfield concession	4	5	7	0	1	0	
Greenfield concession	40	6	0	127	3	1	
Divestiture	5	2	1	3	10	1	
Mgmt & lease	1	5	5	0	0	0	
<b>Totals</b>	<b>50</b>	<b>18</b>	<b>13</b>	<b>130</b>	<b>14</b>	<b>2</b>	<b>146</b>
			<b>81</b>				

<b>SSA</b>				<b>South Asia</b>			
PPI Projects in SSA's Energy Sector - 1995-07				PPI Projects in SA's Energy Sector - 1995-07			
(Investment by PPI type - US\$ millions)				(Investment by PPI type - US\$ millions)			
	Generation only	Distribution (& transmission)	Combined functions	Generation only	Distribution (& transmission)	Combined functions	
Brownfield concession	395	87	1 378	0	22	0	
Greenfield concession	3 586	2 233	0	34 680	433	0	
Divestiture	1 020	338	0	1 697	2 387	677	
Mgmt & lease	0	5	0	0	0	0	
<b>Totals</b>	<b>5 001</b>	<b>2 663</b>	<b>1 378</b>	<b>36 377</b>	<b>2 842</b>	<b>677</b>	<b>39 896</b>
			<b>9 042</b>				

Source: World Bank and PPIAF, PPI Project Database

**IPPs.** Twenty of the generation projects reaching financial closure in SSA since 2000 are normally classified as independent power producer (IPP) projects. Like public-private partnerships generally, there is no single, universal definition of “independent power producer” (IPP). Usually the term refers to a privately-sponsored power generating facility that sells electricity through a national power grid, pursuant to a long-term contract (the power purchase agreement or PPA). The facilities are normally “project financed,” meaning that they are heavily financed with debt, with most of the financing coming via limited-recourse loans to special purpose project vehicles. The PPAs are highly technical documents that usually serve to confirm for lenders that power will be purchased at specified prices under a variety of circumstances. The PPAs are often supported by government payment guarantees and credit enhancements like letters of credit, escrow accounts, liquidity facilities, tax exemptions, etc., but the confidentiality and severe risk engineering of most PPAs (shifting the responsibility for managing many key risks to governments) has created controversy in connection with some African power projects (box 3.1).

In most developing countries, the purchaser (or off-taker) of the power is a state-owned electricity utility that carries out retail power distribution to customers. In cases where the domestic power market has been liberalized, the so-called “single buyer” market may no longer exist and IPPs may be able to sell power to competing distribution companies and/or large private users. The definition of IPP is usually limited to greenfield projects, although privatized (or concessioned) brownfield generating facilities can also operate in this fashion.

The use of IPPs has been promoted for decades by development institutions like the World Bank, who see these projects as essential elements of reform programs designed to move vertically-integrated power utilities toward competition. But as some earlier sections of this paper indicate, IPPs normally entail large risks and are difficult to structure in ways that ensure the reliable,

long-term, cost-effective generation of affordable power. Risks can include opposition from local and international civil society groups, geological or weather problems (in the case of hydro projects, water flows may be less than anticipated), natural disasters, bureaucratic delays (including delays in arranging financing from private sources or DFIs), escalating construction costs, overly optimistic estimates of economic growth and power demand, abrupt changes in government policies, laws, or regulations affecting the power sector, unfair competition from existing state-owned electricity utilities, failure to meet operating standards required by lenders, negative environmental impacts, fuel supply or pricing problems (in the case of thermal plants), and changing business strategies on the part of investors and operators.

A major source of concern regarding IPPs in many LICs is the fact that typically, neither the host government nor the utility off-taker is particularly creditworthy, so their pledges to make good on PPA commitments tend to have little credibility with project financiers. No SSA government or power utility is classified by international rating agencies as “investment grade,” and some are virtually bankrupt. This does not necessarily mean that once an IPP reaches financial closure it cannot be sustained—in fact, empirical studies of “successful” IPPs do not find correlations between success in achieving project objectives and the creditworthiness of off-takers. But lack of such creditworthiness makes project financing more expensive, requires more support arrangements on the part of host governments, and probably means that a substantial number of potential power generating projects in poorer regions like SSA are not even considered for development as IPPs. Lack of off-taker creditworthiness often results from retail electricity tariffs that do not cover substantial portions of operating costs, poorly targeted subsidies, and electricity regulators who do not promote the use of cost-reflective tariffs in a transparent, consistent manner.

Since the early 1990s, a total of about 40 IPPs have reached financial closure in SSA, but about half of them are smaller than 40 MW. The 40 IPPs contribute about 4,400 MW of generating capacity, out of a total capacity of about 75,000 MW for all of SSA. In other words, the track record of SSA’s IPPs has been modest. They have added small, but much needed amounts of

### **Box 3.1: The Controversy around Power Purchase Agreements (PPAs)**

On November 12, 2002, a Ugandan judge ordered the release of the power purchase agreement (PPA) that had been signed by the government during preparation of the Bujagali hydropower project, an independent power producer (IPP) project that was expected eventually to generate 200 MW of power from a facility to be built on the River Nile. Press accounts first cited government officials as saying that the PPA did not exist. In arguments before the judge, the government eventually argued that release of the PPA would impair the government's economic credibility and the private operator's legitimate commercial interests.

Why would a court case be needed to make public such a document, signed by the government and effectively committing Ugandan citizens to pay specific prices for electricity generated by the plant? The answer is complicated, but it helps explain some of the difficulties of doing viable IPPs in developing countries.

PPAs are important, widely-used tools for identifying and allocating IPP project risks among public and private parties. The collapse of many power projects during the Asian Crisis triggered a private sector search for a "bomb-proof" PPA, which would protect private partners from all kinds of project risk. As a result, PPAs have become more complex and technical over time. But whatever these changes, an enduring aspect of most PPAs is the inclusion of "take or pay" clauses that require the government off-taker to pay for a pre-determined amount of electricity from a private generating facility even if consumer demand is insufficient for the retail sale of all that power. For hydro plants, these clauses may also apply to payments required whether or not water flows are adequate to generate the needed supply. Critics charge that take-or-pay clauses constitute a kind of corporate welfare, by reducing key private sector project risks to almost nothing.

The financial terms of PPA can be burdensome for government purchasers of power in other ways as well. The agreements normally set prices to fully cover the debt service needed to repay construction loans, operation and maintenance costs, tax liabilities, as well as return on investor equity. In the case of most African IPPs, the payments for power purchase also must be made in hard currency to protect the IPPs from exchange rate risks associated with the changing relative values of foreign currency, required to pay debt service, and local currency, in which project revenues are normally denominated. In times of economic crisis, PPAs can trigger sharp increases in power costs: the real cost of power increases because the local currency loses value, but power prices also increase in effect because while demand may decrease, take-or-pay clauses require off-takers to pay the same amount to the generator.

PPA's are usually kept confidential for a number of commercial and reputational reasons, and sometimes they are associated with projects that involve uncompetitive bidding, secretive negotiations between public and private partners, corruption, poor planning by governments, incomplete mitigation of various project risks, as well as exceptionally high power prices. Whatever legitimate commercial reasons might be involved in keeping such documents confidential, even the World Bank's Inspection Panel has admitted that full disclosure of such documents is necessary if the general public is to be in a position to consider the social and economic implications of such projects.

In an effort to introduce some rigor into the process of developing PPAs, the World Bank developed a set of procedures that could be used by government officials in a reasonably thorough evaluation of PPA terms and conditions, and help document and justify a government's reasons for supporting particular PPAs. The procedures were published in 2008, in connection with World Bank work in the Nigerian power sector. The procedures make use of international best practice and performance benchmarks to carry out: (i) an assessment of a PPA's completeness; (ii) evaluations of the average purchase price, price affordability, and project risks; and (iii) an assessment of price-risk trade-offs (Besant-Jones, et al., 2008).

As for Bujagali, the controversy around the "non-existent" PPA faded briefly when the private operator who had negotiated and signed the agreement pulled out of the project after various delays and allegations of corruption. The project was eventually rebid and a new PPA was signed in late 2005. The new PPA was eventually made available in hard copy only by the Ugandan regulator's office.

generating capacity, and most of the projects have survived distress and renegotiations to prove themselves as sustainable projects. But many of these projects have not been well structured, and some do not produce reliable, cost-effective power. In effect, most of these IPPs have been pilot projects as most SSA countries have not fully committed to private power generation, because of difficult experiences completing and maintaining IPPs as well as the desire to continue supporting state-owned utilities. Overall, independent power production remains a marginal aspect of SSA's energy sector.

Hydropower IPPs. These projects represent a type of IPP that is desperately needed in Africa, where 93 percent of the continent's economically feasible hydropower potential (about 10 percent of the world's total) remains untapped. The AICD study suggests that regional hydro projects are one of the few ways of scaling up power development in Africa so that projects become economically and financially viable. And hydropower projects of any significant size cannot be done without mixed public-private involvement. But if traditional thermal IPPs are difficult to do, hydropower projects are even more challenging, despite large amounts of concessional financing available for such projects from donors and MDBs. The World Bank has done only one national-level hydro IPP in the last decade—Bujagali—which took 15 years to complete (box 3.2). The Bank currently has two dozen hydropower projects in its development pipeline, but expects none of them to be finished in the near to medium term. Only one other national-level hydropower IPP has reached financial closure in Africa, the 400 MW Bui project in Ghana, currently being developed by the Chinese firm, Sino Hydro, with an expected completion date of 2012.

Distribution and transmission. PPI projects other than generation have also played a small role in this sector since 2000. Sixteen projects over this period involved electricity distribution and integrated utilities, and accounted for US\$1.2 billion in investment. Five natural gas transmission and distribution projects were completed since 2000, involving US\$2.2 billion in investment. The performance of these kinds of projects has also been generally disappointing. Projects representing a third of this total have since been cancelled or are currently in distress. Perhaps because of these performance issues, investment in electricity distribution and transmission relative to generation is much less in SSA (4 percent) than in the entire developing world (14 percent). The use of emergency rental power generating facilities is also much higher in Africa than in other regions—SSA accounts for 53 percent of all such contracts world-wide.

Distribution concessions. Brownfield concessions involving electricity distribution are rare in SSA, with only 7 projects reaching financial closure from 2000-09, and only two involving distribution only. Such projects have proved to be extremely risky, particularly in poor countries. Concessionaires must rehabilitate and extend distribution networks, then recoup their investments via the retail sale of power to thousands of customers under price regimes that are normally determined by regulators. Although “independent” regulation has become the norm in SSA, this does not always mean that price setting will not be influenced by highly contentious political circumstances, or that prices will allow cost recovery by the concessionaire. Since the Asian Crisis, such projects globally have been more likely than any other power project to experience cancellations, major disputes, or non-renewal after scheduled contract termination. The incidence of such problems is higher in SSA than in other regions. Distribution concessions that are likely to be viewed as successful by both public and private stakeholders will require

### Box 3.2: Bujagali – Challenges for Hydro IPPs

Uganda's Bujagali hydropower IPP is scheduled to begin limited operation by the end of 2011. This will bring to a close one of the most problematic, expensive and controversial IPPs ever attempted in Africa. In fact, Bujagali will be the first hydro IPP of any significant size to become operation in SSA. Its experience provides a dramatic account of the kinds of challenges facing hydro IPPs in Africa.

Bujagali's development began in 1994 with the signing of an MOU between the government and AES Nile Power, a subsidiary of US-based AES Corporation. The project was attractive to the government because although small in size (200 MW) it represented a 70 percent increase in the country's installed generating capacity. When completed, it would help shift reliance from costly thermal power to more reliable and less expensive hydropower and help reduce load shedding, reduce electricity tariffs, etc. As a run-of-the-river project it would not require a traditional dam, and the government hoped it would therefore avoid some of the controversy that was gravitating to dam projects internationally.

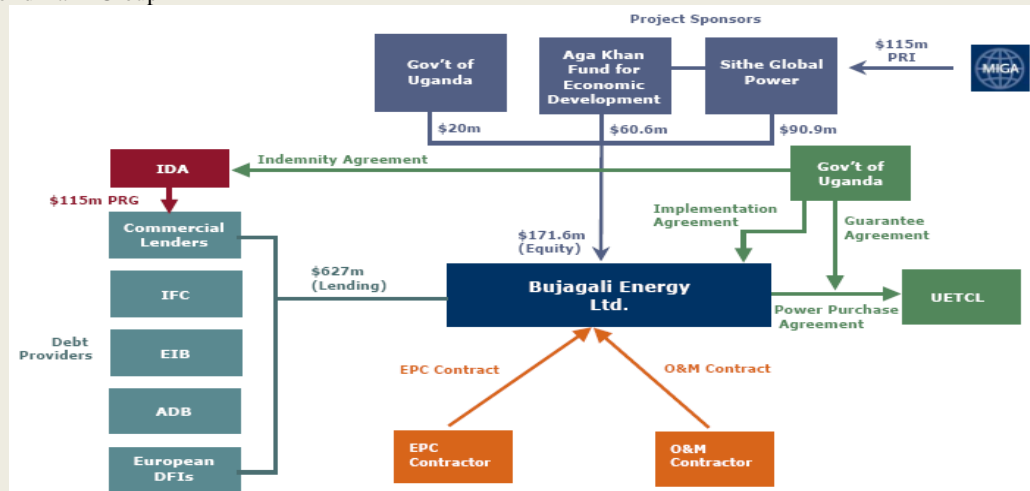
Years of negotiations followed the MOU signing. Over this period the project was plagued with rumors of corruption, poor planning, and over-pricing, fed by the non-competitive selection of AES, and the government's reluctance to make public the power purchase agreement. The project also quickly became the target of heated attacks by environmentalist NGOs and other civil society groups who claimed that it was not a least-cost alternative and would severely damage the environment, despite its avoidance of dam construction. Over this period, the World Bank's Inspection Panel reviewed the project, the Ugandan Parliament debated the PPA in closed session for nine months, NGOs successfully sued the government to release the PPA, then published highly critical evaluations of it, and the U.S. Justice Department launched a corruption investigation. Suddenly, in 2002 a Ugandan government minister admitted to receiving a payment from the AES consortium, the World Bank suspended its support for the project, and the consortium disbanded. In 2003, AES announced its departure from the project.

But the government and the World Bank renewed their commitment to the project and in 2004 a competitive bidding process was initiated. In 2005, the preferred bidder was announced—a consortium led by Industrial Promotion Services, the industrial sector operating division of the Aga Khan Fund for Economic Development. Bujagali reached financial closure in 2007—it had become an US\$860 million, 250 MW, build-operate-transfer (BOT) project, based on a 30-year power purchase agreement signed with the government-owned electricity transmission company. At US\$3.4 million per MW, Bujagali became the most expensive IPP to reach financial closure in SSA by 2010 (Eberhard and Gratwick, 2010).

Perhaps the most dramatic feature of the final deal was the sheer number and complexity of additional supporting arrangements required for financial closure of a 250 MW project (see the graphic below). A host of DFIs and MDBs provided debt financing: IFC (US\$130 million), EIB (US\$130 million), AfDB (US\$110 million), and European DFIs (US\$142 million). Lending by commercial banks was backed by a World Bank partial risk guarantee against an IPS debt service default resulting from government failure to meet its PPA obligations (US\$115 million). The IPS co-sponsor, Sithe Global Power, successfully applied to MIGA for political risk insurance against government breach of contract (US\$115 million). The Ugandan government also contributed US\$20 million in equity—about 12 percent of the equity total—and agreed to security measures like a liquidity facility and a debt service reserve account with escrow features, and of course a sovereign guarantee backing the PPA.

#### Bujagali Project Structure

Source: World Bank Group



cost-reflective tariffs, enforceable rights to disconnect non-paying customers, connection subsidies for the poor (and probably some kind of cross-subsidization of tariffs), visible improvements in the quality and quantity of service, and some degree of protection for existing employees. Structuring concessions to deal with all of these issues requires a host of complex and sometimes expensive risk mitigation features (box 3.3).

In addition, the fundamental problem with brownfield concessions of all sorts must be addressed effectively in the power sector. This is the reluctance of private partners to make large investments in long-term assets, because they suspect that government partners will be unwilling or unable to ensure full compensation for such investments over the life-time of the concession contract. This problem is particularly evident in poor countries because of the unusually high ratio of rehabilitation/extension investment costs to operating revenues over the life-time of the contract. Public partners usually promise to set tariffs at cost-reflective levels to compensate for investment, and mechanisms are usually included in concession contracts to compensate operators for unamortized investments at the end of the contract period. But most private operators suspect that they will not be fully compensated after 20-30 years of operation. Experiments with World Bank partial risk guarantees have shown some promise for solving this problem in the rail sector (box 2.1 in the last chapter). Something similar might be feasible to support brownfield concessions in the power sector.

Management contracts. Only 9 management contracts were concluded in SSA's power sector from 2000-09. These arrangements involve the provision of expertise by private operators pursuant to performance contracts that shift some risk to the contractor—if performance does not meet specified targets, compensation is reduced. Because these arrangements involve little or no investment, they considerably reduce the normal PPP risks faced by private partners. But despite the potential of such contracts for reducing the huge operating inefficiencies in power systems, as well as the reduced risks for private partners, these kinds of PPPs present something of a paradox in SSA. While they seem to do well in achieving targeted performance objectives, that success has had little to do with how the contracts and contractors have been viewed by host country governments (box 3.4).

Divestiture and merchant projects. Perhaps the most dramatic difference between SSA and the rest of the developing world involves the use of “other PPI” projects, like merchant power projects and divestiture of power companies. From 2000-09, these kinds of projects accounted for about 30 percent of PPI investment in power in all developing countries, but only 6 percent in Africa. Globally, the use of these arrangements across all sectors has outstripped that of traditional PPPs since the Asian crisis, because they typically involve lower risks for private partners than PPPs, but often achieve the same results. Partial divestiture, for example, is the most widely used form of infrastructure privatization, largely because it allows a continuing public-private relationship in the management of facility without some of the risks associated with brownfield concession contracts. But although such arrangements can be attractive alternatives to PPPs, they depend heavily on things like liberalized power markets (for merchant plants), and capital markets that can facilitate the privatizations of power companies via share sales. Neither of these features is prevalent in SSA.

### **Box 3.3: Umeme—Making a Brownfield Power Concession Work in SSA**

In 2004, the Ugandan government signed a 20-year concession agreement with Umeme Ltd., a consortium jointly-owned by Globeleq (an investment company owned by the UK government) and Eskom Enterprises (the non-regulated investment subsidiary of South Africa's state-owned energy utility). In 2006, Eskom dropped out of the consortium, and Globeleq was later replaced by Actis Capital, another UK-owned enterprise.

Umeme is one of the rarest of PPP types in the African energy sector, a distribution-only brownfield concession that must purchase power from a government wholesaler and sell it to retail users, in the process recouping the investments it is contractually obligated to make in the rehabilitation and extension of existing assets. Brownfield distribution concessions were the hardest hit form of PPP during the Asian Crisis and the only kind to have never really recovered in the years since. Only two such projects reached financial closure in SSA from 2000-09, despite the urgent need to rehabilitate brownfield assets in this sector—AICD estimates that at least 25 percent of the installed generating capacity in SSA does not currently produce power, mainly because of lack of maintenance, and over 60 percent of these assets require major refurbishment.

Umeme is a classic example of what has proved to be a highly risky PPP arrangement—the concessionaire must rely for its cash flow and profitability on (i) its own skills in targeting and managing rehabilitation investments, (ii) its ability to achieve efficiency improvements in retail service delivery, (iii) the willingness and ability of the government power generator and transmission company to make power available at reasonable wholesale rates; and (iv) the willingness of government regulators to set retail tariffs at levels necessary to ensure that investments can be recouped over the life-time of the concession.

Umeme leases the power distribution system from the Uganda Electricity Distribution Company (UEDCL), one of the three government-owned companies created when the government unbundled its single, vertically-integrated electricity utility in 2001. The concession contract imposes the kinds of obligations on Umeme that made such projects so vulnerable to cash flow problems during the late 1990s. Umeme must: (i) operate and maintain UEDCL's electricity distribution network for 20 years; (ii) bill and collect revenues from all connected customers based on tariffs set by the government's Electricity Regulatory Authority; (iii) make an investment of at least US\$5 million in the first 18 months of the agreement and a minimum of US\$65 million in system rehabilitation over the first five years of the agreement; (iv) pay monthly lease fees to UEDCL for the use of the distribution assets; and (v) return in good order control of all assets, including all new investments, to UEDCL at the end of the 20-year lease period.

In order to make this classic concession structure work, the government and its development partners had to agree to several non-classic project features, mostly designed to mitigate risks that Umeme perceived to be associated with government promises regarding regulation and payments for electricity services:

- A partial risk guarantee (PRG) of US\$5.5 million was issued in support of the concession by the World Bank. The PRG makes possible a Letter of Credit issued by Citibank Uganda, which Umeme can access if it experiences cash flow problems due to failures by the government to make good on commitments regarding (i) tariff regulation (e.g., the regulator must allow full pass-through of the bulk electricity supply tariff charged by the government's state-owned energy generator and transmission companies); (ii) payment of electricity bills by government agencies (they must pay their bills within 60 days of receipt); and (iii) payments in the event of early termination due to breach by the government (the government must compensate Umeme for all undepreciated investments at the time of termination).
- In addition to the PRG, Globeleq and Eskom applied for and received US\$40.5 million in guarantees covering their equity investment in, and shareholder loans to, Umeme. The 20-year MIGA guarantees cover against the risks of transfer restriction, war and civil disturbance, and breach of contract.
- The concession contract also included an "opt-out" clause, allowing its international shareholders to walk away from the arrangement after 18 months. Umeme would be allowed to recover from the government half of its initial investment obligation of US\$5 million if it decided to exit during the trial period, which was later extended by another six months. The opt-out clause provided Umeme with a substantial degree of comfort that they would have protection during the early, high risk years of the concession. (As Guasch, 2004, found in his study of concessions in Latin America, 42 percent of these projects required renegotiation within 2.2 years of initiation.) Although Umeme and the government disputed a number of issues during the trial period, the opt-out clause was never used. By 2010 Umeme had invested US\$96 million in the distribution network—considerably more than the US\$65 million required by the contract.

Finally, also very important for Umeme was the fact that donors and MDBs like the World Bank continued their support for Uganda's power sector, in ways that were extremely helpful to the concession. For example, in 2007 the Bank provided US\$300 million loan to the government, which among other things was designed to pay for a new thermal generation facility explicitly justified by the need to supply adequate levels of affordable power to Umeme.



### **Box 3.4: Questions about Management Contracts**

The use of management and lease contracts has grown in many developing country regions, as prospective private partners attempt to limit their liabilities on potentially risky PPI projects. Management contracts (and leases) typically involve little or no capital investment by private partners, who normally are remunerated via fees paid by governments (often adjusted for performance) rather than from tariff revenues collected from customers. According to the PPI Database, the numbers of such low-risk contracts have remained stable since the late 1990s, never accounting for more than 10 percent of all PPI contracts. They mostly involve water and sanitation services, followed by transport. Less than 20 percent of these contracts are for electricity-related services.

In the 1990s, such contracts were sometimes viewed a first step toward deeper forms of PPI, such a long-term concessions. The frequency with which that actually happened has been low, although in Africa such transitions occurred in Mali and Gabon. But since the late 1990s more of these contracts have been viewed as ends in themselves – ways of making relatively short-term improvements in operating efficiency and transferring skills to local staff. They are also increasingly paired with investment programs paid for by governments and their donors. For example, in 2006 the Kenyan government signed a two-year contract with Manitoba Hydro to manage electricity distribution services on behalf of the government's Kenya Power & Lighting Company (KPLC). The KPLC contract was paralleled by a US\$150 million multi-donor electricity sector recovery project in Kenya, which donors felt needed support from the management contract for full and efficient implementation. A similar arrangement exists in Ghana, where a water management contract is paralleled by a large donor-funded sectoral investment program.

But questions about the extent to which such contracts meet the needs of governments have been raised because so many of these arrangements have not proved to be sustainable. The AICD study notes that 17 management contracts have been concluded for electricity services in 15 SSA countries, but that only three remain in operation. Four were terminated prematurely, and others were simply not renewed. The KPLC contract falls into this latter category – the Kenyan government announced in April 2008 that the arrangement would end after its first two-year term. Local Kenyan newspapers attributed the decision not to renew to government concerns over high costs and poor performance. Anti-privatization critics characterized the termination as more evidence that such “stealth” privatization arrangements almost always fail.

But the actual situation of the contract is more complicated. The contract was never intended as a transition to a longer-term PPI arrangement, and in fact only made allowance for a one-year extension. Both the government and the contractor agree that at least three-fourths of the long list of performance targets were met, although the two parties disputed the precise percentage (and the exact size of the resulting performance bonus). But compensation paid to the expatriate management team was much higher than that ever received by prior Kenyan managers, and the contractor also had to weather several labor disputes. Any extension of the contract was supposed to be paid for by the Kenyan government (the first two-years was paid for by the World Bank), and that would have been difficult given other critical spending priorities that had arisen in the wake of the country's post-election civil unrest in 2008.

The non-renewal of management contracts in Africa has also been part of a process that has occurred several times in the African water sector (e.g., in Uganda and South Africa), where a series of short-term expatriate contracts demonstrated to government decision makers that training, more independence, and better compensation can lead to more efficient, commercial operations directed by government managers. In the meantime, more needs to be done to improve the performance targets and incentives incorporated into such contracts, customer service issues must be better addressed, and cost-effective generation planning and procurement must be recognized as foundations for the successful implementation of such contracts in the electricity sector. For more on these kinds of performance improvements, see Ghanadan and Eberhard (2007).

As for the KPLC management contract, the anti-privatization rhetoric that accompanied the non-renewal of that agreement in 2008 seems to have been more the result of local election campaigning than any profound dissatisfaction with the contractor. In June 2009 KPLC and Manitoba Hydro announced the signing of a MOU to formalize joint efforts to bid for electricity business opportunities in Africa (KPLC, 2009). A year later, the two partners won a bid for a 5-year management contract to improve the performance of the Liberia Electricity Company.

## 4. Regional Power PPI

### 4.1 Overview

This chapter discusses the role that regional PPI projects might play in Africa’s power sector. This is an important issue because developing regional or cross-border projects (involving two or more government “owners” of the project) would address several key problems in sector. One is the lack of generating capacity in SSA—regional projects with multi-country off-takers would allow countries with fewer power resources to import power from neighbors with more resources than they need for national purposes. Another problem is the small average size of SSA IPP projects (91 MW for the 38 IPPs studied by Eberhard and Gratwick, 2010). The small size makes them unattractive to many international companies—too much must be spent on project preparation compared with the ultimate financial returns and the risks that must be managed. The AICD study recommends that large, regional hydropower projects be developed as a way to facilitate more energy sector investment in Africa. On a regional scale, large hydropower schemes could be financially and economically justifiable because they are designed to anchor cross-border power transmission and trading.

This chapter explores the challenges surrounding regional power projects in SSA by covering the following topics:

- The Challenges of Regional Hydropower
- Previous Efforts to Develop Regional Power Projects
- The Potential of Regional Power Pools
- PPI Performance in Regional Energy Projects
- The Importance of National Governments for Regional PPI Projects
- The Biggest Single Problem with Regional PPI
- The Role of Donors and MDBs

This chapter concludes that so far, no truly cross-border hydropower generation projects (involving multi-country project ownership) have reached financial closure in SSA, and only two regional power projects of any kind have closed—both natural gas transmission projects. Other power generating projects are sometimes referred to as regional projects because although they are “owned” by a single country, excess power is generated and then sold to off-takers in other countries. But only a few IPPs fall into this category. One reason for optimism in this regard is the ongoing Program for Infrastructure Development in Africa (PIDA), sponsored by the African Union, NEPAD, and the African Development Bank. The results of the flagship PIDA study, due in early 2012, are expected to include the identification and prioritization of regional infrastructure projects, including regional PPI energy projects, that donors, MDBs, and African actors can take forward into preparation.

### 4.2 The Challenges of Regional Hydropower

While the need for more electricity generation is massive and growing rapidly in SSA, the thermal and especially hydro resources necessary to produce that power are available, but

generally not under development. The AICD study points out that SSA accounts for 10 percent of the world's economically feasible hydropower potential, but only about 7 percent of SSA's potential is being exploited.

Several problems limit the ability of SSA to make full use of this potential:

- Most of the economically exploitable hydro resources are located in countries like DRC, Ethiopia, and Guinea, which cannot justify the exploitation of such resources on the basis of their own national needs, and are far removed from industrial centers with the demand for that kind of supply. A country like Ethiopia is exploiting these resources for its own needs. Accordingly, the projects do not involve transmission lines or off-take agreements necessary for them to serve regional purposes. Because they are done for national purposes, the projects are relatively small and can be done without help from the private sector.
- Power transmission between these countries and those with much higher power demand is under-developed, meaning that significant investments in transmission facilities would be a necessary part of major hydropower exploitation in SSA. (AICD calls for annual investments of US\$10 billion in transmission and distribution, in order to realize 22,000 MW of new cross-border transmission capabilities in ten years.)
- Four regional power pools have been established in SSA, with the intention eventually of trading excess power among member countries. But excess power is not being generated in any region, and such trading is non-existent currently except for some activity in the SADC region. The ability of these pools to actually manage such trading probably will require extensive further development.
- The most cost-effective exploitation of regional hydropower resources would require the countries with power development potential to become exporters of power and others to become importers. AICD estimates that as many as 16 SSA countries would be economically better off if they imported more than 50 percent of their power needs. But this means that many African countries would have to reconcile themselves to a situation in which they were not responsible for their own energy security.
- Hydropower projects are difficult to do under the best of circumstances. They have much higher upfront capital costs than thermal projects, require long and expensive preparation, often involve significant environmental impacts and social displacement, and almost always attract heated opposition from environmental NGOs and other civil society groups, both locally and internationally (see the discussion of Bujagali in the last chapter, box 3.2). Even with the help of MDBs and donors, hydro projects are difficult. The World Bank has done only one national-level hydro project in the last decade (Bujagali, which took 15 years to complete and has become one of the most expensive and controversial IPP projects ever to reach financial closure in Africa). A country like Ethiopia has the capacity to make good on its impressive plans for hydropower development—without the private sector's participation. But the development of huge, regional hydropower projects, one of which could easily be nine or ten times the size of

Ethiopia's existing installed capacity, is probably beyond the capabilities of Ethiopian officials to manage without considerable outside assistance.

- Any kind of large infrastructure project involving more than one country owner is exceptionally difficult to do, anywhere in the world. Such projects raise thorny questions about who should develop such projects, who borrows to finance them (and under what conditions), who benefits from the projects, who administers them, etc. All of these problems can be solved, and have been addressed in regions like Latin America, but such projects are not common anywhere.

### **4.3 Previous Efforts to Develop Regional Power Projects**

Regional integration has been a high priority in Africa for many years, and has spawned a complex regional network of organizations designed to work across borders on important issues, including infrastructure. These organizations include the Regional Economic Communities, power pools, transport corridor authorities, as well as continent-wide bodies like the African Union, NEPAD (now known as the Nepad Planning and Coordinating Agency, or NPCA), and regional DFIs like the AfDB and DBSA.

Energy is probably the infrastructure sector where the need for regional projects has been most often discussed, but most often frustrated. The small size of national power markets in Africa has drawn considerable attention over the last three decades. Of the 48 SSA countries in 2008, 36 have less than 1,000 MW of generating capacity and 23 under 200 MW (EIA), a threshold that AICD says is well below the minimum scale needed for system efficiency.

A series of high profile efforts have been undertaken in SSA since the end of the 1990s, to identify, develop and implement regional infrastructure projects. In 2002, after long consultations with other regional organizations, NEPAD published its Short-Term Action Plan (STAP). STAP identified over 100 activities, which included facilitation, capacity building, studies as well as about 40 investment projects. By the time of the final STAP evaluation in 2010, STAP included 27 energy sector projects, of which 12 were classified as investment projects (2 involved power generation).

But STAP performance was consistently disappointing over the years, for all the reasons that make regional projects of any kind difficult to do anywhere. A considerable number of STAP projects were abandoned as unsuccessful or simply stopped making progress. The final STAP evaluation found almost no information on many of the projects and even had trouble locating an authoritative list of projects after all of the additions, deletions, and amendments since 2002.

Problems with STAP energy projects fall into several areas:

- Political: There was no single STAP implementing or monitoring body. NEPAD acted as a coordinating agency. The RECs were viewed as “owners” of and “executing agencies” for STAP activities. But neither RECs nor power pools had the authority to make regional investment decisions or had even the general support from member states necessary to drive these projects. In any case, member states demonstrated low levels of

commitment to regional power projects, and political instability and conflict in some regions made cross-border projects impossible.

- **Financial:** Investment projects in the energy sector were generally not prepared to a level that would demonstrate bankability to investors or donors/MDBs. Project objectives often were unclear, making cost estimates difficult. Very little attention was paid to different kinds of potential financing sources and arrangements. Most of the investment projects were not specifically targeted to the private sector, but were intended for regional DFIs or MDBs.
- **Technical:** Power projects were often stymied by the lack of coordinated cross-border operating frameworks and technical standards. Access to transmission systems remained unclear for many projects. Regulatory frameworks lacked harmonization.
- **Project management:** Many STAP projects, including those in the energy sector, lacked real implementation plans, milestones, target dates, or the assignment of responsibilities. Project progress was not monitored on a regular basis by anyone.

The lessons of STAP have not been lost on key regional stakeholders. In 2010, the African Union, with donor funding and in association with NPCA and the AfDB, launched its Program for Infrastructure Development in Africa (PIDA), which includes a vastly better resourced attempt to identify and prioritize regional infrastructure projects across Africa, as well as address the political, financial, technical and project management challenges mentioned above. The general TOR for the PIDA study clearly states the importance of the private sector for the achievement of PIDA objectives: "... it should be noted that an explicit aim of PIDA is the mobilization of private sector participation in infrastructure development" (African Union, et al., 2009, Sect. 2.3.6). The PIDA study, expected to be completed in early 2012, will focus much of its effort on regional energy projects.

#### **4.4 The Potential of Regional Power Pools**

AICD estimates that if regional power trading were pursued to its full economic potential, it would cut US\$2 billion annually from SSA's total power system development and operation costs. Much of that would result from the substitution of hydropower, generated in countries like DRC and Ethiopia, for thermal power now used in much of the rest of Africa—even accounting for the higher initial capital costs of hydro projects. Power trading of this kind would help make large hydro projects commercially viable and facilitate much needed private investment in such facilities. But power trading is almost non-existent in SSA, and questions exist about the ability of the four regional power tools to carry out such trading.

The power pools were of course created with power trading in mind. They would link generation and transmission across borders to enable the dispatch of available capacity from one system to another in a way that matches supply and demand in a region. These coordinated linkages would allow individual utilities to select the least-cost mix of generation and transmission capacity and thereby reduce capital and operating costs while retaining reliability and security of power supply.

The four regional power pools established in SSA are in very different stages of development. The Southern Africa Power Pool (SAPP), created in 1995, is the most advanced of the pools, with market mechanisms for power trading, environmental guidelines, and joint planning activities. More than 90 percent of Africa's power trading takes place in SAPP, although most of it has been on a bilateral basis between South Africa and its neighbors, and the amount of this trading has declined recently as South Africa has begun to experience power shortages. In all, however, only 16 percent of Africa's total power is traded, in contrast to the 40 percent of a much larger total installed capacity, which AICD estimates would be necessary to keep pace with GDP growth.

Why do SSA power pools not play a stronger role in power planning and trading? Several key reasons have been identified (Castalia, 2009):

- Power pools do not have mandates to take planning or investment decisions. Member governments have not made legally enforceable commitments regarding power pool authority in matters of planning, pricing, settlement rules, etc. Often because of sensitivities around energy security, power pools lack strong support from member states.
- Power pools also lack capacity to carry out many of these functions. The pools typically depend heavily on the expertise of their members, most of whom are state-owned utility companies. Neither membership lists nor regional indicative investment plans normally emphasize the importance of IPPs (power pool lists of existing projects sometimes do not even include IPPs).
- A key power pool capacity shortcoming is in the area of finance mobilization. Most power pools do not carry out investment planning in way that takes into account likely sources of finance. Investment plans typically have a "wish list" character, with projects for which economic and financial viability have not been established, or projects that are technically and politically so challenging that the chances of their realization in the near future are non-existent.
- As a consequence of some of the shortcoming mentioned above, power pools generally lack the skills or orientation to seriously consider ways of increasing private participation in the energy sector.
- Finally, several more exogenous factors limit the effectiveness of power pools. The shortage of excess power generating capacity means that very little power is available for trading. The lack of regional regulatory bodies means that technical codes and regulatory issues are not harmonized across borders. The RECs, power pools, and river basin commissions have generally not worked out mutual responsibilities for power program monitoring or supervision.

There are reasons for optimism. All of these power pools know what is expected of them and all are actively engaged in regional power issues. They all receive support from African regional organizations like the AU, NEPAD, AfDB, as well as the RECs. Donors and MDBs have also

focused on the importance of power pools in recent years. Regional regulation is also beginning to develop, particularly in southern Africa.

#### **4.5 PPI Performance in Regional Energy Projects**

SSA's actual experience with regional infrastructure projects suggests that they will continue to be difficult. The World Bank's PPI Database has recorded only four regional infrastructure projects on the African continent since 2000 (all in SSA). Two of these have been in the power sector—both greenfield natural gas transmission projects. The possibility of developing large, cross-border hydro IPPs seems even more remote. Since 2000, only two national-level hydro IPPs have reached financial closure in SSA. One was the Bujagali project in Uganda (250 MW), developed with the help of the World Bank and expected to start operation in late 2011. The other is the Bui hydro project in Ghana (400 MW), currently being developed by the Chinese firm, Sino Hydro, with an expected completion date of 2012.

In 2003, a renewable energy project development company owned by five African governments—Westcor—was created to drive the development of Inga III in the DRC, expected to be the largest hydropower IPP ever attempted in Africa (3,500 MW), and the first truly regional generating project. Eventually, the DRC was approached by aluminum company BHP Billiton with an offer to help develop a somewhat smaller plant to power a planned smelter in the country. DRC then decided to develop Inga III as a national project, rather than a regional one, and Westcor took a decision to disband. Inga III is still likely to have regional characteristics, but the original plans for significant new generating (and cross-border transmission) capacity have been put aside. Nevertheless, the Inga III experience offers a host of important lessons regarding the pitfalls of regional hydropower IPPs in Africa (box 4.1).

However, it would be misleading to imply that large regional projects are easier to do in some other region. Since 2000, the PPI Project Database has recorded only three other cross-border energy projects in other developing country regions, two in Latin America and one in Europe and Central Asia. The reasons for so few regional projects are well understood in PPI markets. In 2009, international rating agency, Fitch Ratings, summed up these reasons in a special report, "Large Projects, Giant Risks?" Some of the lessons discussed in the paper include the following:

- Large infrastructure projects require popular support and political clarity (especially with regard to comprehensive costs) in order for approval, funding, and implementation to be carried out in an uninterrupted, non-controversial fashion.
- Risk allocation and governance are critical factors for the success of infrastructure projects, but large regional projects typically entail an even larger and more complex set of risks generated by public and private stakeholders with overlapping and conflicting interests.
- The conceptualization and planning of large projects are particularly lengthy and complex exercises; this complexity entails uncertainty, which in turn requires contractual and financial flexibility—things that are not often found in tightly engineered PPP contracts.

#### **Box 4.1: Inga III – the Challenge of Regional Hydropower IPPs**

Inga III, the largest hydro-power IPP in Africa for which some preparation has been undertaken, offers useful lessons regarding the challenges associated with the preparation of such projects. Inga III was intended to be the third and largest project in the Inga basin of the Congo River in the DRC. It was expected to generate 3,500 MW and cost US\$5 billion, including transmission system investments of US\$1.5 billion.

In 2003, DRC's power utility joined with four others in southern Africa – the likely off-takers of Inga III power – to create the Western Power Corridor Company (Westcor Pty Ltd.), to develop the project. But at 3,500 MW Inga III would have been by far the largest energy project ever attempted in Africa – as of 2010, the largest hydro IPP in Africa was the 400 MW Bui generating plant in Ghana, expected to be on-line in 2012. A project the size of Inga III would require funding from a variety of private and public sources, as well as an IPP operating structure. Westcor agreed to finance technical pre-feasibility and feasibility studies, as well as an environmental impact assessment. The World Bank provided a US\$600,000 grant to the DRC to finance an early stage, client-executed “bankability assessment” to set out a financing strategy and structuring plan for the project.

The bankability consultants concluded that the total cost of the project had reached almost US\$9 billion. They recommended a financing plan involving US\$6.6 billion provided by four MDBs, six DFIs (like DBSA, FMO, etc.), export credit agencies, Chinese policy banks, and commercial banks. In addition, over US\$2.2 billion in equity financing would have to come from independent power producers, vendors, EPC contractors, as well as the DRC government, who would have to source external concessionary loans for its share. The staggering size of the required investment, 78 percent larger than 2005 estimates, gave pause to all of the prospective project participants. A total project cost estimate of US\$9 billion would likely mean total public and private sector preparation costs of well over US\$1 billion.

The study (by BNP Paribas, 2009) also highlighted a host of project risks, in addition to the huge size of the financing needed. The expected 12-year construction period meant that it would be “extremely challenging to commit the off-takers for such a long period on a take-or-pay basis... no one can foresee what price countries or private users will be willing to pay in 12 years for power.” The fact that the DRC had “no legislation and no single set of procedures for the award of a concession in a form suitable to the project” would require project sponsors to obtain rights and authorizations from various governmental and local authorities in order to implement the project – but such authorizations would be granted in different ways for different time periods, increasing political risks for private investors, as well as the possibility of corruption.

As the bankability study was being completed, several other developments were unfolding around Inga III. Interest was growing on the part of some African regional organizations in bypassing Inga III in favor of moving forward directly with Grand Inga, a 40,000 MW generating project. At the same time, the DRC government was approached by BHP Billiton with an offer to locate an aluminum smelter in the country if they could construct Inga III as a 2,500 MW plant, at a total cost of US\$3.5 billion, which would supply electricity to the smelter. The DRC accepted BHP Billiton's offer in 2010 and declared the regional dimension of Inga III to be at an end. At that time, Westcor indicated that it would disband.

Inga III offers a number of lessons about large hydro-power IPPs in Africa. First, the idea of a special purpose, multi-stakeholder project company like Westcor seems like a reasonable approach for addressing the problem of who should develop and manage such a project. Unfortunately, the individual country shareholdings in Westcor were never more than US\$100,000 each, severely limiting the work that Westcor could actually undertake.

Second, the World Bank's suggestion of a recipient-executed, early-stage “bankability” study was an extremely useful tool in initiating realistic thinking about what downstream transaction activities would be needed, like financing and structuring strategies, as well as the upstream preparation needed in areas like legal and regulatory reforms.

Unfortunately, both the Westcor preparation work and the bankability study suffered from a lack of funding. Westcor never raised the financing needed to carry out the technical feasibility study and environmental impact assessment. The DRC's bankability study was under-resourced with grant funding, plus the consultants had trouble accessing information from DRC officials—the study took over three years to complete. The absence of the Westcor technical studies and delays in completing the bankability study meant that much of the original project momentum was lost by the time BHP Billiton made its offer to take on the Inga III project.



- Large projects usually involve extraordinary construction constraints that must be carefully managed in terms of technical, contractual, and managerial arrangements.
- Cross-border projects are highly sensitive to geopolitics, a type of risk that is particularly difficult to manage.
- Reasonably accurate demand forecasting for infrastructure projects is always difficult, but it is especially difficult—and quite hazardous—for large regional projects.

Thus, unlike the earlier discussion of PPI in the energy sectors of other regions, the rest of the developing world does not have much to offer in terms of best practice in regional PPI projects. Solving this particular problem in a way that achieves significant benefits for Africans will require truly ground-breaking work by African stakeholders in the area of regional power PPI.

#### **4.6 The Importance of National Governments for Regional PPI Projects**

Perhaps the fundamental problem with regional PPI projects in any sector is the fact that such projects depend on the strengths and will of the national governments involved, rather than regional organizations. This is the case for two reasons:

First, private partners insist on dealing with sovereign governments, not supranational entities like RECs or power pools. Most power purchase agreements in Africa will require sovereign guarantees because of the weak credit standing of government utility off-takers. Every participating government that purchases power will need to supply such guarantees in support of large regional projects. This does not mean that large regional projects can or should be done without private sector participation. In fact, typically any large infrastructure project in Africa will necessarily involve the private sector, whether the project was originally anticipated to be a PPI project or not. Experience with the Bujagali project (250 MW) suggests that even generation projects under US\$900 million may be too big to be financed exclusively by donors and MDBs (the original idea behind Bujagali), because of country lending ceilings. In other words, the involvement of the private sector in most regional infrastructure projects will mean that financial closure of any of them will depend on the strengths of the participating national governments.

Second, MDBs also favor relationships with sovereign national governments, and they typically define regional projects in ways that emphasize leading roles for the individual sovereign governments involved. Some so-called regional funding is typically available from sources like the World Bank or the African Development Bank, and such funding may help project debt go significantly above the individual country lending caps established by these financiers. But virtually all such lending must be attributed to individual sovereign governments. Because virtually every large infrastructure project in Africa also must involve support from MDBs, how these multilateral organizations view regional projects is extremely important. A good deal of work is ongoing in these organizations to find better ways of supporting regional projects, and some experiments have been attempted, but for the foreseeable future the success of regional projects will depend on the strengths of national governments.<sup>4</sup>

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<sup>4</sup> By the terms of its charter, the World Bank is unable to lend for projects not backed by sovereign government guarantees of repayment. But in 2006 the Bank and the IFC created a joint department to make loans and guarantees

The leading role played by national governments in regional PPI projects does not mean that such projects cannot be successful—it is not essential for a regional body like a REC or a power pool to “own” and “execute” a regional project for it to be viable. Assuming this key role played by national governments, regional projects have been attempted in several ways, some of which hold promise for more extensive application:

- Some “regional” projects have been done as separate, but coordinated, national projects. For example, the Kenya-Uganda Rail concession actually involved two parallel concession contracts, supported by two sets of MDB support packages, as well as two different local incorporations of the same operating company. But because technically this was not one project co-owned by two governments, it has never been classified as a cross-border project.
- Some regional projects have been done as private sector-driven “merchant” projects that minimize public-private contractual risk sharing and depend on separate off-take agreements with governments. For example, some of the undersea ICT cable projects have been driven and financed by private sector consortia that sell service off-takes to individual governments. Because these merchant projects are not co-owned by more than one government, they are also not classified as cross border projects.
- Some regional PPI projects have been done as projects that are driven by direct agreements between visionary heads of state. An example of this is the Maputo Development Corridor established in 1996 through a partnership between Mozambique and South Africa established and energized by Presidents Nelson Mandela and Joaquim Chissano. The corridor links South Africa’s most industrialized heartland, the Gauteng province via Mpumalanga province in the east, to the Mozambican port of Maputo. This arguably is the only successful regional spatial development corridor in Africa—perhaps because such cooperation at the highest levels of government is hard to come by.
- A few regional projects have been driven by special purpose vehicles owned and managed by share-holder governments. An example of this was Westcor’s ill-fated attempt to develop Inga III as a regional project involving five off-taking governments. Westcor was under-resourced and slow to move Inga III ahead, but did suggest that an SPV approach might be effective under other circumstances. SPVs have been used with mixed results on some regional power projects in SSA not involving the private sector (box 4.2).

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available to sub-sovereign government entities, such as provinces and municipalities. The commitments were booked on the IFC’s balance sheet because of the Bank’s charter restrictions. The program was highly successful, but the global financial crisis reduced the IFC funding available for these sub-sovereign lending activities and the program was cut back in 2010. Nevertheless in showing the viability of sub-sovereign lending, not backed by sovereign national guarantees, the program suggested the possibility of making such loans and guarantees available to qualifying supra-national entities as well. Such a program is under consideration at a number of MDBs.

#### **Box 4.2: Selected Regional Hydropower Projects in SSA (not involving PPI)\***

**Cahora Bassa** is a large hydropower project on the Zambezi River in Mozambique, consisting of a dam, a 2,075 MW generating plant and a 1,420 km transmission line to a sub-station in South Africa. The original purpose of the project was to supply South Africa with low cost power. Only about 75 MW of total capacity was reserved for Mozambique's domestic market, although that share has been increased substantially and the country now relies on the project for 90 percent of its power (peak demand is now about 500 MW). The project was designed in the mid-1960s, promoted jointly by the governments of Portugal and South Africa. The dam was completed in 1977, but the war of independence in Mozambique interrupted power transmission to South Africa from 1981 to 1998. The facility and its transmission lines needed extensive repair in the late 1990s for power transmission to resume. The facility now operates at close to full capacity. The facility is owned and operated by an SPV, Hidroelectrica de Cahora Bassa (HCB), which is majority owned (85 percent) by the Government of Mozambique (Portugal sold its majority holding in the company in 2007).

Overruns in construction, the 17 years without revenue from South Africa, plus the restoration needed in the late 1990s, made the total project hugely expensive. By 2007 its total debt had reached over US\$3.5 billion. The project survived only because the Portuguese government backed the debt and absorbed the losses during the long period of inactivity.

**Nangbeto** is a small hydroelectric facility on the Mono River, which forms the border between Benin and Togo. The facility consists of a dam, a 65 MW power generating plant, and transmission lines. The objective of the project was to provide Benin and Togo with low cost power as an alternative to the power that both countries were importing from their neighbors. The facility was designed in the early 1980s and construction was completed in 1988. It operates at close to full capacity except for several months of each year when generation is not possible because of low water levels in the Mono River. This puts the total annual power output at about 35 percent less than it would be with full year-round operation. The scheme is owned and operated by Communaute Electrique du Benin (CEB), a utility co-owned by the two governments. It sells Nangbeto's power to the two state-owned distribution utilities. The governments provided sovereign guarantees for the financing, which came exclusively from ODA in the form of an IDA loan from the World Bank, as well concessional financing from a collection of other MDBs and donors. The project cost about US\$123 million, somewhat less than original estimates because of changes recommended during construction by a panel of experts financed by the World Bank.

Revenues of CEB have been below expectations because the off-taking distribution companies cannot pay the full cost of the power due to low collection rates and tariffs set well below cost-recovery levels. CEB is unable to cut off power supply because of intervention by the two governments.

**Ruzizi II** is a small hydroelectric facility on the Ruzizi River, which flows from Lake Kivu to Lake Tanganyika in Central Africa, forming the border between Rwanda and DRC. The facility involves a dam and power station (36 MW), plus related infrastructure. Its purpose is to supply utilities in Burundi, Rwanda, and DRC with additional low-cost hydropower. The project development process was plagued by low capacity on the government side, plus a lengthy effort to secure all of the financing necessary for the project. Preparation started in 1975, construction in 1984, and operation in 1989. The construction and operation of Ruzizi II is handled by the Societe Internationale de l' Electricite des Pays des Grands Lacs (SINELAC), which also owns the facility. (Early stage development of the project was handled by another regional organization, EGL.) SINELAC was created in 1984 and is owned and jointly managed by the three governments. Funding for the project came from the Fonds Europeen pour le Developpement (FED) and the World Bank (IDA).

From inception, SINELAC has faced severe problems with financial viability, defaulting on its debt service obligations because the off-taking utilities are not paying for the wholesale power, due to poor collections and below cost-reflective tariffs. As with Nangbeto above, SINELAC has no remedies for non-payment in its purchase contracts with the off-taking utilities—the governments refuse to allow cut off of services for non-payment. As a result maintenance is underfunded and repairs seriously delayed.

**Manantali** is a small hydropower project built in the 1970s by the river basin organization, Organisation pour la Mise en Valeur du fleuve Senegal (OMVS), a regional entity created by Mali, Senegal, and Mauritania. The project began with a dam, completed in 1987. But a cost overrun on the dam of 100 percent plus coordination problems among the participating countries delayed construction of the transmission lines and power plant (196 MW) for ten years. Energy production began in 2001. OMVS created an asset holding company in 1997 to operate the facility; that company subsequently signed a 15-year management contract with ESKOM Energie Manantali (created as an SPV by ESKOM South Africa) to manage the power plant's operations pursuant to a 15-year management contract. The contract also obligates EEM to collect payments from the three distribution utilities for the power off-take (from EEM deducts its fee). The hydropower phase of the project cost US\$450 million and was funded by donors and MDBs, including the World Bank (IDA), as well as export credit agencies.

Once again, governments acting as both owners and customers have created problems with payment discipline and overall commercial viability. Off-taking utilities have not always paid their bills, and the asset holding company has not always met its debt service requirements.

\*Sources: World Bank, ESMAP, PIDA Draft Phase I Report.

- Most existing generation projects that sell power to other countries (and thus have regional characteristics) have been developed as purely national projects with excess capacity that is sold cross-border. Usually, the financing for such projects is backed by the government of the country in which the plant is located, and other purchasers are not involved at the development stages.

Any of these arrangements can be used to drive cross-border energy PPI projects. Unfortunately many of the basic inhibiting factors identified in the STAP evaluation will continue to limit the use of such arrangements. Many African countries have unclear or under-developed policies, plans, procedures and regulations for preparing, structuring and overseeing PPI projects, and there is very little cross-border harmonization of these legal-regulatory enabling frameworks for regional projects. But the biggest limiting factor now, as it was when the STAP was initiated, is the general reluctance by national governments to support regional projects. In many cases, this reluctance arises from energy security concerns (some countries have legislated limits on imported energy dependence). In other cases, national officials feel that regional planning bodies lack expertise. Somehow, national interests must be better reconciled with regional priorities in Africa if regional PPI projects are to proliferate in any sector.

Of course, recognizing the key role of national governments in owning and driving regional projects does not mean that regional organizations like RECs and power pools have no role. Indeed, probably their most important function will be to facilitate the national/regional reconciliation mentioned in the paragraph above. Other key roles for these actors are the cross-border harmonization of national policies, plans, regulations, the facilitation of early stage project appraisals, as well as monitoring of project progress. It is critical that these organizations build public awareness regarding regional infrastructure and the need for national governments to participate in its development. But care must be taken to avoid references to RECs and power pools “owning” regional PPI projects, which are likely to reduce national interest in such projects even further.

## 5. PPI Performance Factors: *What Governments can do to Optimize PPI Performance in the Energy Sector*

### 5.1 Overview

This chapter is organized in a manner that generally follows a methodology for evaluating the experience with IPPs developed at Stanford University (Victor, 2003) and later applied to projects in SSA by researchers at the University of Cape Town (Gratwick and Eberhard, 2007). The methodology departs from earlier approaches that focused on the stability of contracts as the primary signal of project performance, and focuses instead on factors that facilitate project outcomes that meet reasonable expectations—whether or not contracts have been adjusted or renegotiated. These “performance factors” are divided into macro-economic factors, country-level factors, and project-level factors, and government options for optimizing PPI performance by dealing effectively with these factors are discussed under each of these headings (summarized in table 5.1). This chapter concludes with comments on what donors and MDBs can do to help.

**Table 5.1**

PPI Performance Factors:

What governments can do to optimize them

Factors	Potential Problems	Government Actions
Macro-economic factors	<ul style="list-style-type: none"> <li>- Local currency depreciation;</li> <li>- Interest rate increases;</li> <li>- Lower economic growth;</li> <li>- Shortage of project finance for small projects in risky countries.</li> </ul>	<ul style="list-style-type: none"> <li>- Maintain emphasis on infrastructure investment;</li> <li>- Use government or donor/MDB funding to substitute for private sources;</li> <li>- Structure projects to deal with private sector risk perceptions.</li> </ul>
Country-level factors	<ul style="list-style-type: none"> <li>- Weak political leadership;</li> <li>- Poor investment climate;</li> <li>- Flawed policy, planning, regulation;</li> <li>- SOEs given preference;</li> <li>- Weak capacity to procure, negotiate, monitor, etc.</li> </ul>	<ul style="list-style-type: none"> <li>- Strengthen focus on business climate;</li> <li>- Seek capacity-building technical assistance from donors/MDBs;</li> <li>- Focus on best project candidates in priority sectors, leave the rest for ODA.</li> </ul>
Project-level factors	<ul style="list-style-type: none"> <li>- Project fragility caused by severe problems with PPI project cash flows &amp; profitability in poor countries.</li> </ul>	<ul style="list-style-type: none"> <li>- Structure projects to reduce private partner risks;</li> <li>- More donor/MDB help mitigating increased public partner risks;</li> <li>- Careful use of 3rd party guarantees.</li> </ul>

Source: Author's compilation.

## 5.2 Macroeconomic Performance Factors

Macro-economic instability constitutes a major risk to PPI projects in the power sector. Nothing demonstrates this better than the experiences with such projects during the two largest financial crises since the mid-1990s, the Asian Crisis beginning in 1997 and the global financial crisis beginning a decade later. How governments responded to these crises suggest ways of optimizing the performance of PPI in the face of macroeconomic instability.

### 5.2.1 Macroeconomic Factors

Sources and types of PPI financing. Macroeconomic factors affect PPI in many ways, but the most direct impacts are on the cost of financing (resulting from changes in interest rates) and the value of project revenues (resulting from changes in the value of local currency or the local demand for services). The degree of macroeconomic impact on a project depends on the sources and types of funding used to finance it. The classic non-recourse project finance approach involves a mix of equity provided by a private partner, and debt from private sources, to implement a project that generates debt service payments and equity returns exclusively from the sale of services generated by the project. But in the developing works, particularly in poorer regions like SSA, several variations on the classic model appear frequently, and these sometimes affect the susceptibility of projects to macroeconomic changes.

- Debt vs. equity. In risky environments, private partners often protect themselves from losses by increasing as much as possible the debt-equity ratio in project financing. This means borrowing as much as possible, and doing so through a separate corporate entity (SPV) acting as the project company. If the project collapses, equity losses are minimized, governments often must compensate lenders, and in any case, the borrower (the SPV) is the defaulting entity, not the private partner who sponsored the project. But large debt service obligations increase the fragility of the project by imposing large, inflexible demands on cash flows (equity returns can be delayed if necessary). If revenues decrease because of diminishing demand, or inability of customers to pay, a cash flow crisis is possible. (For more on this, see Sect. 5.4 below.)
- Foreign vs. local private finance. In poor countries, local banks may not be able to provide the long-term financing necessary for infrastructure projects. Private partners (or their SPVs) may have to borrow from foreign sources, in foreign currency. In such cases, if the local currency (in which project revenues are denominated) depreciates in value relative to the foreign currency (in which debt service payments must be denominated) projects can face serious cash flow problems. Involvement by local private partners may be on the increase across the developing world. Local partners may have better access to local sources of finance, and may sometimes help create project structures that are more resilient in the face of macroeconomic stress.
- Donors and MDBs. MDB financing plays an important role in many SSA PPI projects, particularly in the power sector, and their low cost financing and flexible terms can help provide protection in times of macroeconomic stress. Some private-sector oriented MDBs, like IFC, PROPARCO, DEG, FMO, and CDC, have acquired equity shares in

power projects or provide debt financing to private partners in such projects. Other MDBs and bilateral donors provide financing to governments for sector reforms that help strengthen individual PPI projects, or as funding that can be granted or on-lent to private partners to help finance projects. MDB and donor support is an important supplement to private sector financing of PPI projects in poor countries, and is especially important during times of macroeconomic stress. However, such financing has historically been pro-cyclical, meaning that it diminishes in times of macroeconomic crisis, as the crisis affects the economies of the donor nations.

- Non-OECD financiers. Another source of financing for large PPI power projects in SSA comes from the so-called non-OECD countries, like China and India. This is an entirely different model, which focuses mostly on non-PPI projects, but includes some that involve Chinese companies in PPP-like relationships with African governments (box 5.1). This funding seems to have been largely immune from recent macroeconomic shocks, like the global financial crisis, probably because these economies weathered the crisis so well.

The Asian Crisis of 1997. The effects of the Asian Crisis on power PPI in developing countries were consistent with conventional wisdom about how macro-economic shock should affect investments—the shock began in the developing world, was severe, and effectively collapsed the IPP market in such countries for the next 7-8 years. The various dimensions of the crisis had dramatic effects on PPI power projects, depending on how the projects were structured.

Currency depreciation has perhaps the widest range of negative impacts on power projects, particularly PPPs involving large capital investment. Projects dependent on local currency revenues, but financed by foreign currency debt, face foreign exchange losses in servicing that debt. Depreciation also means that projects that import fuel often face sharply rising local currency costs. Where wholesale electricity tariffs charged by IPPs are denominated in foreign currency, the local currency cost of utility off-take obligations (formalized in PPAs) often sharply increase.

Local currency interest rate increases mean that domestic financing is often not an alternative to foreign currency financing for projects under development. Interest rate increases also slow domestic economic growth and lead to higher prices for all manner of domestic products. All of this tends to reduce the demand for electricity, diminish opportunities for PPI in the power sector, and damage the financial solvency of utilities that purchase privately-generated power. Higher local construction costs make it more expensive to build plants, even if they are needed. In East Asia, the 1997 crisis reduced total new private power development by more than 50 percent over the period 1998-2001. By August 1998 Indonesia had canceled 16 IPP projects, many of which had signed contracts (Gray and Schuster, 1998).

The Global Financial Crisis of 2007. Although the Asian Crisis had massive impacts on the global market for PPI power projects in developing countries, it had negligible impacts on such projects in SSA, largely because so few projects were in implementation or under development. The global financial crisis starting in 2007 had a much stronger impact on Africa PPI despite the

### **Box 5.1: Non-OECD Investment in SSA Infrastructure\***

A number of middle-income countries, including China, India, and some of the Gulf States, have begun playing significant roles in SSA's infrastructure development. Combined infrastructure investment by such countries is comparable to flows of Official Development Assistance (ODA) from member countries of the Organisation for Economic Co-operation and Development (OECD). The non-OECD contribution has recently averaged an annual total of around US\$2.5 billion, but has risen as high as US\$7 billion in 2006.

China's funding is channeled through the China Export-Import (Ex-Im) Bank rather than through a development agency. The Ex-Im's mission is to promote trade, and its funding reflects this. It is the only Chinese institution allowed to make concessional loans to overseas projects, but on average its loans are not classified as concessional (or ODA) because they typically do not include the 35 percent grant component that OECD requires for ODA classification.

China's funding relationship with African partner countries is designed to maximize mutual benefit. The Ex-Im Bank operates like an export credit agency, with financial support routinely tied to the use of Chinese contractors. The Ex-Im Bank also often makes use of the so-called "Angola Mode" of deal structuring, in which loan repayments are made in the form of natural resources, such as oil. The arrangement allows financing for countries that cannot provide bankable guarantees to back their borrowing and helps China acquire the resources it needs to fuel its massive and rapidly expanding economy.

China typically funds large-scale infrastructure projects in hydropower and railways. At least 35 African countries have engaged with China on such deals, with 70 percent of Chinese funding going to four countries: Nigeria, Angola, Ethiopia, and Sudan. In addition to US\$4 billion in rail sector investments, AICD reports that most of the Chinese financing has gone to 10 large hydropower projects with a combined generating capacity of over 6,000 MW. That represents a 30 percent increase over existing hydropower capacity in SSA. China is also financing 2,500 MW of thermal power. In all, that total investment represents well over 10 percent more capacity for SSA. Large-scale power projects include the 2,600 MW Mambilla hydropower project in Nigeria and the 1,250 MW Merowe hydropower scheme in Sudan (plus another 1,400 MW of thermal generating capacity in that country).

African governments have generally been receptive to Chinese financing. It comes without policy reform requirements or over kinds of conditionality often associated with MDB loans from OECD sources. The Ex-Im policy is to follow the social and environmental policies of the borrowing government rather than require adherence to its own standards. The relationship with the Chinese government is typically based on partnership and solidarity, and it facilitates development driven by central governments, usually without the need for private sector participation (although Chinese firms like Shenzhen and Sinohydro appear to be involved in PPP-like project relationships with African governments in some cases).

But the Chinese approach is not without its critics. Civil society groups, many of whom are already unhappy with the environmental and social safeguards used by OECD financing sources, have expressed concerns about the standards applied in Chinese financed projects, particularly in the construction of large dams needed for hydropower. Questions are sometimes raised in Africa about the quality of Chinese equipment and construction services. Perhaps above all, questions have been raised about the value of such deals for African governments. Projects can be done more quickly with Chinese assistance, without MDB or donor safeguards or the need to satisfy private sector bankability requirements. But the lack of transparency regarding the actual terms of deals crafted using the Angola Model has left many observers wondering if the deals actually generate value for money for African counterparts. Presently, this question cannot be answered because of the confidentiality of the terms.

India has also been scaling up the involvement of its Ex-Im Bank in SSA, particularly in supporting power projects in countries like Nigeria and Sudan, where it is also developing natural resource interests. Such deals have averaged US\$500 million per year of the 2003-07 period. Arab countries have also averaged around US\$500 million per year for SSA infrastructure projects over the 2001-07 period, mostly for smaller projects in the transport sector (mostly roads).

The emergence of these new kinds of financiers in SSA has important consequences beyond the obvious increase in available capital financing. AICD points out that these financiers tend to fill a gap left by other financing sources. ODA tends to focus more on public good infrastructure, such as water and sanitation, rural roads, broad power sector reforms, etc. PPI focuses on telecommunications. China, India, and the Arab states help make up the shortfall left for productive infrastructure like hydropower and transport.

Non-OECD financiers offer African governments a significant alternative approach to traditional infrastructure finance involving public and private sources. But African officials will have to work hard to ensure that this kind of funding makes an optimal contribution to economic growth and poverty reduction on the continent.

\*Sources: Foster and Briceño-Garmendia (2010); Foster, et al., (2008).



fact that this crisis started in the so-called developed world, creating early optimism that Africa would be sheltered from its worst effects. The degree of damage to PPI in each region derived from the extent to which the region relied on international project finance for such projects. Project finance volumes in both developed and developing countries had exploded over the 2002-07 period, with the global total in 2008 (for all sectors) over four times the total in 2002. PPI totals for developing countries clearly benefited from this surge, growing by 3.5 times over the same period.

The growth in global project finance beginning in 2002 resulted from changes in financing mechanisms and banking relationships used by international banks. These changes generated huge increases in liquidity, which in turn drove down loan pricing and gave borrowers the upper hand in negotiations. Some of this liquidity increase spilled over into developing country markets, as international lenders used some of it for riskier loans in those markets. Much of this spill-over went to Europe and Central Asia (ECA), where European lenders took advantage of reforms driven by EU accession, like infrastructure PPPs and privatization, which required project finance.

But some of the larger PPI projects in poorer regions like Africa benefited as well from this liquidity spillover, and this helped account for the PPI growth in Africa illustrated earlier in this paper. African banks tend to be less tightly integrated into the global banking networks than those in ECA or LAC, and this is directly reflected in the low levels of PPI in Africa – African banks have little long-term money available at affordable interest rates for infrastructure investment, and local capital markets are shallow or non-existent. But the huge amount of international project finance liquidity beginning in 2002 meant that some large African PPI projects benefitted directly from financing by these international lenders. In other cases, local or regional African banks borrowed from these international banks or capital markets to raise financing needed to make PPI loans, or used credit lines from international banks to back lending to large African projects. Large PPI projects in Africa have always benefited from regional and international DFI funding, as well as investment by development-oriented financiers like IPS or Globeleq. Local African commercial banks have played a role in this investment, but international project finance was critical in facilitating large projects during the region's period of strongest PPI growth from 2002-08.

The global financial crisis meant that the international lenders who had financed this surge in project financed investment suddenly had less money to lend on a project finance basis. They began to insist on higher interest rates, shorter terms, more equity, etc., to help compensate for the increased perception of risks associated with these projects in developing countries. In general, pricing of loans went up as liquidity diminished and control of loan negotiation processes shifted back to lenders.

As the crisis unfolded, less money became available for projects in riskier emerging markets. The Nigerian press reported that dozens of requests by local banks for guarantees and credit lines needed from international banks to allow lending to local infrastructure projects had been rejected, putting those projects on hold. Some local banks and investment funds in Africa, particularly in South Africa and Nigeria, still had the liquidity necessary to participate in syndicated or club deals. But there were fewer such lenders as the crisis deepened, their interest rates increased and they were willing to lend less per transaction. Many simply stopped making

commitments because of near-term market uncertainties. In the best of times, local financiers could rarely supply all the financing needed for large PPI projects without international lenders and regional or international DFIs.

### 5.2.2 Government Actions to Mitigate Macroeconomic Risks

Governments and their development partners learned from the experience of the Asian Crisis and responded somewhat differently to the global financial crisis. One way was to recognize that infrastructure investment is an important tool in the arsenal to deal with an economic downturn. Many countries put in place some form of stimulus package in response to the global financial crisis, with infrastructure often being highlighted. Not only can well-planned infrastructure investments provide counter-cyclical economic stimulus, but they are also critical to laying the foundations for economic growth in the longer term. A judicious combination of operations and maintenance (O&M) and investment expenditures is critical in this regard. Maintaining or scaling up O&M expenditures can be undertaken quickly and counter-cyclically. Larger investment projects may take some time and must be undertaken on the basis of sound project identification and prioritization.

A second response to the crisis was to act aggressively to maintain a role for the private sector in infrastructure project management and financing. The most dramatic way in which governments kept alive PPI project pipelines was to provide some or all of the financing for these projects, via loans, equity, grants, or guarantees. Developed countries like Australia and the UK were particularly aggressive in this regard. In the UK, the government attempted to salvage its PFI investment program with an investment fund capable of providing up to 100 percent of the financing needed for projects to proceed. The intention was for this financing to be as short-term as possible, with the loans refinanced from commercial sources as soon as markets recovered and up to 70 percent of any refinancing gains going to the government procuring entity.

In developing countries like South Africa, India, Brazil and Mexico, government-owned development finance institutions provided funding or guarantees to keep alive PPI pipelines by kick-starting projects. In countries without such resources, donors and MDBs made an effort to help fill this gap. The IFC created a global fund that was able to substitute donor funding for commercial finance in order to start new PPI projects and keep alive existing ones. In other developing countries, donor or MDB money allowed some infrastructure projects to begin using conventional public sector procurement and implementation, with the intention of bringing in private participation when feasible at some later date.

The global investment numbers for PPI in developing countries, particularly in the energy sector, remained high through the global financial crisis, precisely because of very large projects in the middle-income countries like India, China, and Brazil, where state-owned or controlled banks or DFIs were encouraged to take the place of retreating commercial banks. The “ultra mega” power projects in India, at 3,500-4,000 MW, are perhaps the most notable examples of these huge projects, which continued to drive PPI growth in the global power sector as the financial crisis unfolded.

Private partners and their financiers are clearly less worried about mega power projects in middle-income countries than about power projects of any size in low-income countries. The

large projects are engineered with the usual risk mitigation mechanisms, but such projects are in a sense, too big to fail. If problems with cash flows and profitability materialize private partners feel confident that governments will have too much at risk to allow project collapse, especially when state-owned or state-controlled banks have helped finance these projects. In any case, these governments have the resources to make good on their contractual commitments.

But private partners do not have the same confidence regarding projects in low-income countries, and as a result, PPI programs in poor countries suffer much more in times of macroeconomic crisis than do programs in more affluent countries. The projects are smaller and direct government involvement is much less. If the private partner's only protection comes from risk mitigation measures that simply shift all risks to government partners during times of crisis, then such protection has little meaning in countries that do not have the resources to honor such commitments. Cash flow problems in poor countries lead almost inevitably to renegotiation—as has been the case repeatedly with African IPPs. And in poor countries, the chances of renegotiation resulting in contract changes that fully solve these cash flow problems are much less likely than in middle-income countries. PPI in SSA was indeed hit hard by the global financial crisis (figure 2.5 in chapter 2). Numbers of new PPI projects in all sectors were still falling in 2009, according to the latest data available. PPI-related investment that was happening was concentrated in older projects that had already proved their sustainability and projects in the telecommunications sector, seen as much less risky than other forms of infrastructure investment. Without the ability to contribute directly to project financing, poor countries need to rely more heavily on donors and MDBs to help finance PPI projects, along with the country-level and project-level options described below.

### **5.3 Country-Level Performance Factors**

Macro-economic factors are indeed “country-level” factors, but while they help explain stresses that affect the development and implementation of PPI projects in the energy sector, they do not explain why some countries tend to manage these stresses well and others do not. This section discusses other kinds of country-level factors like political leadership, policy-making, planning, as well as human resource capacity issues over which governments and their development partners have more control.

#### **5.3.1 Politics, Policy, and Public Administration**

Political leadership. A highly important success factor in facilitating significant infrastructure investment via PPI arrangements in Africa is the willingness of political leaders to enthusiastically recognize the potential use of private participation to improve or enhance public service provision. Political leadership has long been recognized as critical to the success of PPI programs in Africa, beginning with the evaluations done of the African privatization programs in the 1980s and 1990s (Jones, et al., 2002). Developing country governments often succumb to pressure from donors and development agencies and agree to take initial steps to create policies conducive to private participation, but if key political leaders harbor reluctance to embrace PPI concepts the reform steps are usually piece-meal and half-hearted and do not send clear messages of intention to potential private partners. In fact, Africa's power sector demonstrates this partial approach to PPI-related reform.

In many countries politicians must overcome ideological opposition to involvement of the private sector in public service delivery (their own opposition as well as that of their constituents). Such opposition might have been formed, for example, during liberation struggles when business sectors were perceived to be supporting the political status quo. For many politicians it is simply counter-intuitive to believe that the private sector can be trusted to provide essential services at affordable prices. In many poor countries, especially those with high levels of corruption, such disbelief is not uncommon. The “private sector” in such countries often is associated in the public mind with businesses owned or supported by politicians. This makes PPI hard to sell to the general public. Where corruption is prevalent, politicians may feel uncomfortable promoting policies that seem to legitimize it.

Politicians must also be willing to wait for feasibility studies to confirm project costs and benefits before deciding whether or not to proceed with projects. In some cases, politicians may only carry out a kind of simple calculus and conclude that likely benefits do not outweigh the political and/or social costs of doing such projects. This may be because these officials lack the capacity to conceptualize projects. However, these politicians may also be estimating more or less accurately the likely success of a project – it is important to acknowledge that many poor African countries simply have fewer opportunities for commercially viable PPI projects compared with countries in regions that are more heavily populated by MICs. But no one knows for certain until some kind of rigorous cost-benefit analysis is attempted by experienced technical people.

In order to facilitate successful PPIs in the power sector, politicians must also be willing to tolerate reductions in (or elimination of) sector domination by large, state-owned power companies. This means forgoing many of the traditional benefits provided by these SOEs to governments. Such benefits include highly-paid patronage jobs, extra employment and social safety net benefits at lower income levels, as well as opportunities to isolate debts and revenue shortfalls from general budgets. Nowhere in Africa has the “standard” model of power sector reform, involving unbundling of functions, competition and privatization, been fully adopted by national governments, although some aspects of that model appear in almost every country. Kenya is a notable example of a country that mixes standard reform measures with traditional sector dominance by state-owned enterprises (box 5.2).

The investment climate. In examining the impact of the investment climate on the development of IPP projects, Gratwick and Eberhard (2007) refer to an extensive list of desirable country characteristics, most of which are missing in African countries: macro-economic stability, an active capital market and efficient banking system, a history of upholding contracts, easily available access to arbitration, the relative absence of corruption, the availability of a well-educated and productive workforce (at reasonable rates of pay), and a growing economy with a focus on increasing the private sector’s role in infrastructure service provision. They also include on this list the prospect of identifying more than one investment opportunity.

Credit ratings are probably the most widely referred to short-hand measures of the strength of a country’s investment climate. They gauge the likelihood that an entity (sovereign government, bank, or corporate borrower) will be willing and able to repay its debts in a timely manner. Several African middle-income countries (South Africa, Botswana, Namibia, etc.) have what

### Box 5.2: Reforming the Power Sector in SSA—the case of Kenya

In the early 1990s, several African countries began to embrace power sector reforms, driven by power shortages as a consequence of decades of poor performance by state-owned utilities (including inadequate investment in new generation capacity and as well as operations and maintenance). Influenced by innovative restructuring of power sectors in the USA, UK, Chile and Norway, and the advice of MDBs and bilateral development agencies, these African governments adopted aspects of what has been called the ‘standard’ model of electricity sector reform, defined as a series of steps, inclusive of private sector participation and regulatory reform, that move vertically-integrated utilities toward competition. The steps usually included the unbundling of generation, transmission and distribution assets. Countries that followed this approach to some extent were Côte d’Ivoire, Ghana, Kenya, Nigeria, Senegal, Tanzania, and Uganda. But their experiences in implementing reforms were dissimilar. This box examines the experience of Kenya, which eventually embraced what Eberhard & Gratwick (2010) have called a “hybrid” reform model.

In Kenya in the 1990s, the Kenya Power and Light Company (KPLC) was the main vertically-integrated power utility, with a history dating back to 1922. The inefficiency of the utility was underscored by a decade of inadequate generation capacity, unreliable power supply, and exacerbated by persistent drought and a heavy reliance on hydro-power. A policy reform paper adopted in 1996 by the government set out a strategy to separate the regulatory and commercial functions of the sector, facilitate restructuring and promote private-sector investments, including through independent power producers (IPPs).

The Electric Power Act was promulgated in 1997, which assigned policy formulation to the Ministry of Energy; regulation was devolved to a new Electricity Regulatory Board (ERB), which became operational in 1998. At the industry level, KPLC was restructured to unbundle its activities and create two entities: Kenya Electricity Generating Company (KenGen) to take over electricity generation and KPLC focused only on transmission and distribution.

IPP procurement started in 1995 with two 20-year ‘BOO’ contracts being awarded on a competitive-bidding basis: (i) a geothermal plant—Olkaria III, developed by OrPower4—which became operational in 2000; and (ii) a diesel-fired thermal plant—Kipevu II, developed by Tsavo—which commenced operations in 2001. In 1996, due to a power crisis, KPLC facilitated two additional “stop-gap” IPPs using 7-year PPAs: the 46 MW barge-mounted kerosene-fired *Westmont* facility and the 44 MW medium-speed diesel *IberAfrica* facility. Because of the haste in procurement and short duration of the PPAs, the cost of power from these two facilities was considered excessive, leading to renegotiations at the end of the contract periods. *IberAfrica* eventually agreed to a 50 percent decrease in its charges. *Westmont* however disinvested due to its failure to reach agreement with the government. Despite the involvement of IPPs, KenGen and KPLC remained dominant players in the sector.

In 2003, the government conceded that electricity services in the country were still too unreliable and expensive, despite the restructuring. To rectify the situation, a decision was taken to deepen reforms in the sector. This was detailed in a national energy policy of 2004 and a three-year plan to: (i) establish a rural electrification authority and increase rural electrification by 10 percent per annum; (ii) facilitate a competitive market structure for generation, supply and distribution of electricity; (iii) establish a Geothermal Development Company to explore and undertake development of Kenya’s geothermal resources for power purposes; (iv) enact new legislation, inter alia, to dissolve ERB and establish a new energy-sector regulator – the Energy Regulatory Commission (ERC) tasked with broader oversight of electricity supply and usage, inclusive of natural gas, petroleum and renewables; and (v) partially privatize KenGen through an IPO of 30 percent on the Nairobi Stock Exchange (NSE).

The government continued to pursue IPPs as a strategy, such that by 2010, more IPPs had reached financial closure in Kenya than in any other African country. For example, by 2009 it had commissioned a 90 MW plant at Rabai in Mombasa, operational on a 20-year ‘BOOT’ contract with Aldwych International (awarded in 2006); in 2009 Mumias Sugar Company was supplying 26 MW to KPLC (an increase from its previous level of 3 MW), and in mid-2010, KPLC was negotiating six new IPP projects (three via an international competitive-bidding process; and three for wind projects totaling 360 MWs on a direct-negotiation basis). Finally, KPLC was also seeking extensions of two existing IPPs, *IberAfrica* (for 52 MW) and OrPower (for 52 MW).

By 2010, the government had also achieved most of the reforms detailed in the 2004 paper. The flotation of 30 percent of KenGen’s equity on the NSE was oversubscribed by 233 percent, raising KSh26 billion (USD325 million) - and became the largest IPO on the NSE. In late 2008, the government had also incorporated the Kenya Electricity Transmission Company (KETRACO), to construct, operate and maintain new high voltage electricity transmission networks. Efforts were also underway to diversify power sources (and reduce the heavy dependence on hydropower).

Kenya has made dramatic progress with power sector reforms, but not exactly in a manner recommended by the “standard” reform model. State-owned companies still play a dominant role, alongside a growing number of private companies. Time will tell, but this “hybrid” approach to sector reform may be more relevant to the needs of African countries, and is likely to dominate the African power sector reform picture for years to come.

rating agencies call “investment grade ratings” (BBB- or higher), but none of the low-income countries in Africa has such a rating and their debts are therefore categorized as “speculative” from an investment point of view. The term “investment grade” historically has referred to debt securities that market regulators viewed as suitable investments for financial institutions with fiduciary responsibilities like banks or pension funds. Now the term is broadly used to describe issuers and issues with relatively high levels of creditworthiness and credit quality. In contrast, the term “noninvestment grade,” or “speculative grade,” which characterizes most African countries, generally refers to debt securities that the issuer might not be able to repay because of adverse economic or financial circumstances.

Gratwick and Eberhard point out that a weak investment climate does not necessarily rule out large power projects, like IPPs, even in the poorest countries. Kenya and other LICs in Africa have concluded long-term IPP projects in challenging investment environments. But the attractiveness of the investment climate does contribute to the competitiveness of project bids and, as a direct result, the cost of projects. Thus Gratwick and Eberhard conclude that the stronger investment climates in North African MICs, reflected in more investment grade credit ratings, have facilitated larger project financed IPPs on more favorable terms than in SSA’s mostly LICs.

Most low-income countries, including those in Africa, do not generally perform well on the various investment climate surveys that regularly are conducted by development agencies and private organizations. Thus the WB/IFC survey, *Doing Business 2009*, which measured 10 characteristics of doing business in 181 countries just as the global financial crisis was presumably motivating governments to seek more private investment, noted that only 24 IDA countries in SSA enacted significant business reforms in 2008. This number included countries that had recently emerged from conflict, such as Liberia, Rwanda and Sierra Leone. But 16 IDA countries in Africa implemented no major reforms, and 8 other African IDA countries took regressive steps that made business even more difficult. In *Doing Business 2011*, nine SSA countries ranked in the top 100 of the 183 countries evaluated—four were low-income countries.

Policies, laws, plans, and regulatory frameworks. Gratwick and Eberhard define an “ideal” policy framework for guiding and supporting IPPs as one involving two essentials: (1) a clear policy, based on a comprehensive sector master plan, which is consistently implemented by government; and (2) legislation that formalizes the policy. The plan needs to include reasonably accurate supply/demand forecasts, an assessment of least-cost options, and contingencies. The policy needs to elaborate how various subsectors fit into overall sector policy, how state-owned utilities are to be governed, how private participation relates to government provision of services, how PPI projects are to be developed, procured, and negotiated (and who is responsible for doing this), and the powers and functions of regulators (including how licensing of private service providers is to be handled).

The authors find that few African countries have established both a clear policy statement and supporting legislation for the power sector. Some have passed laws permitting IPPs, but almost none have addressed the relationship between IPPs and state-owned energy providers. An exception to this may be Nigeria, where after years of poor power sector planning and management the government is launching a hugely ambitious reform program (box 5.3).

### Box 5.3: Nigeria's Ambitious Plans for Power Sector Reform

In December 2010, the *Nigerian Bureau for Public Enterprises* announced the most ambitious power sector reform program ever attempted in SSA. The program will divest the Federal Government of 51 percent of its equity interest in eleven electricity distribution companies, and offer long-term concessions of not less than 25 years for four thermal and two hydropower stations. But the program is ambitious in terms of scheduling as well as size: the deadline for receipt of interested party applications was February 2011, with the privatization process to be completed by June 2011.

The program is in line with a 2005 policy framework adopted under former President Olusegun Obasanjo. It is aimed at bolstering Nigeria's power sector, which had been operating at less than optimum levels after decades of poor performance, characterized by irregular maintenance, obsolete equipment, and the concentration of generation, transmission and distribution services in the Federal Government's monopoly power company – the *National Electric Power Authority* (NEPA). During NEPA's existence, investments and projects had not been effectively prioritized and planned, and the monopolistic nature of the entity prevented choice and competition in the sector.

Nigeria's per capita consumption of grid-based power is among the lowest in the world, and is surprisingly lower than many other countries in Africa. For example, for a population of just under 160 million people, Nigeria currently has an installed generating capacity of about 6,000 MWs of power, of which only about 3,600 MWs is actually generated. Ghana, its closest neighbor, generates 2,111 MWs of power for a population of just under 24 million. South Africa's 44,074 MWs serves a population of 49 million. By way of comparison, Brazil – which is closer in size to Nigeria, with a population of 201 million, generates 100,000 MWs. Thus power sector investment and growth has lagged far behind Nigeria's population growth over the last 40 years. In the view of many Nigerian officials, the power sector reform process has been a long time coming.

The reform process actually started in 2005, with the passage of *The Electric Power Sector Reform Act* (EPSR). EPSR ended the Government's monopoly in the sector, opening it up to private sector investment and management of power generation, transmission, and distribution. Effectively, Nigeria was following the 'standard' model of reform described by Eberhard and Gratwick (2010). A *Power Holding Company of Nigeria* (PHCN) was established to assume the assets and liabilities (including staff) of the former NEPA. PHCN was then itself broken up into 18 different companies: i.e., 6 generation companies; 11 distribution companies; and one transmission company. PHCN's assets, liabilities, and staff were also divided up and transferred to these companies. The *Nigerian Electricity Regulatory Commission* (NERC) was established to regulate the sector. But full implementation of these reforms suffered delays.

Significantly, the Federal Government's reluctance to stop heavy subsidization of electricity tariffs was part of the problem. The policy to subsidize retail or customer tariffs at levels well below the cost of power production, gave Nigeria the lowest retail tariffs in the world, but also prevented investment in new generation capacity by making it impossible for the private sector to recover the costs of doing business in the sector. According to the Central Bank of Nigeria, Nigerians spent US\$13 billion on generators, diesel fuel, and petroleum to provide back-up electricity in their homes and businesses. Nigeria's poorest people pay more per kWh for candles, kerosene and firewood than manufacturers do for diesel or LPFO generators.

When President Goodluck Jonathan launched the "Roadmap to Power Sector Reform" in August 2010, as his blueprint for accelerating implementation of the EPSR Act, he recognized the delays in execution and prioritized the removal of legal, commercial and regulatory obstacles to private sector investment. Among other things, the Roadmap outlines a plan for identifying and completing rehabilitation and other projects to enhance power generation and delivery from mid-2011. It includes the divestitures and concessions mentioned above.

The Nigerian Bulk Electricity Trading PLC (NBET), also known as "the Bulk Trader," was set up in July 2010 to address concerns of the generation companies' investors regarding the creditworthiness of the distribution companies, the off-takers of power generation. The Bulk Trader will purchase electricity on behalf of the distribution companies until they have established their own track records of delivering power to retail consumers through efficient metering, billing and collections, and can pay for the bulk power themselves. In addition, a World Bank *Partial Risk Guarantee* and a Federal Ministry Risk Guarantee have both been approved on behalf (primarily) of natural gas suppliers and the Bulk Trader to mitigate perceived political and other risks, and give additional confidence to investors about the security of gas supplies and the creditworthiness of the bulk power purchaser. Other measures include (i) establishment of the Nigerian Electricity Liability Management Company (NELMCO) to assume liabilities of the PHCN successor companies; (ii) a review of electricity tariffs to ensure that investors can recoup their investments over reasonable periods of time; (iii) NERC's proactive involvement in eliminating uncertainties with the licensing regime in order to accelerate the establishment of IPPs; (iv) improvements to the regulatory regime to protect consumers and ensure that market participants honor their contractual responsibilities; and (v) establishment of the Presidential Action Committee on Power in May 2010, and the Presidential Task Force on Power in June 2010, to ensure consistency and continuity in policy implementation and compliance with the EPSR Act.

Nigeria reform plans are ambitious to say the least, but also long overdue. All of Africa will be monitoring the effectiveness of this "big bang" approach in the hopes that it may be replicable in other countries.

The AICD study confirms that the institutional framework for infrastructure is no more than “halfway” along the path to best practice in SSA. Progress in one sector is not necessarily linked to progress in another, and the different country categories are moving in different ways and at different speeds. MICs are significantly ahead in the power sector. Aid-dependent LICs are significantly further ahead in the water sector (perhaps because of the strong role played by donors in these sectors), and oil-exporting LICs are slightly ahead in the telecommunications sector.

AICD concludes that infrastructure regulation in Africa is still “in its early days.” Some new laws and regulatory bodies have been introduced for telecommunications and electricity. But the existence of regulators—even purportedly independent ones—does not by itself guarantee positive regulatory outcomes. In order to facilitate PPI projects, regulation must be transparent, fair, accountable, credible and predictable. These regulatory features have not yet achieved a foothold in most African countries. AICD concludes that government interference in regulation continues to seriously undermine regulatory independence in SSA.

Capacity for project development, procurement, monitoring, renegotiation. As the AICD study points out, the idea that PPI projects would overcome service delivery problems caused by institutional deficiencies of governments turned out to be incorrect, if not somewhat naive. Those same government deficiencies have also created problems in government handling of PPI projects, and underscored for government officials the need to invest much more in PPI project development and supervision in order for these projects to realize their potential benefits. But the poorer the country, the greater the need for investment in institutional reforms to get the most from PPI. These higher costs are changing the cost/benefit calculations of governments that are deciding whether or not to go forward with new PPI projects. In many poor countries, the costs are convincing officials to move forward only in a very limited fashion.

A reflection of these institutional deficiencies is AICD’s finding that governments, especially in poor countries, are unable to fully spend their budget allocations for capital investment and recurring expenditures. This problem stems from weak capacity, as reflected in poor sector planning, incomplete project designs, poor or delayed project appraisals, procurement delays, delays in releasing funds, changes in terms agreed on with contractors, and reallocations of budget amounts in response to political or social pressures. These shortcomings, when applied to larger and more complicated PPI projects, have led to long delays in preparing, procuring and negotiating such projects – 3-5 years of preparation is not uncommon in many African countries. Often governments will attempt to use limited competition and direct negotiation to accelerate procurement of these contracts. Gratwick and Eberhard find that IPPs procured this way tend to be more expensive and subject to more problems during implementation. If donors or MDBs are involved in financing these projects, they may require some form of competitive procurement, but rarely are donor procurement rules exactly the same and in the case of involvement by multiple donors/MDBs this can lead to further delays while rules are harmonized.



### 5.3.2 Government Actions to Optimize Country-Level Performance Factors

- Strong political commitment and leadership are critical factors in such reforms, and are clearly evident in the rapidly growing PPI programs in countries like South Africa, Kenya, and Nigeria.
- An important aspect of the leadership role is the willingness to apply available resources to project identification, prioritization and preparation, as well as to project financing in order to lessen risks and costs faced by project companies. India's annuity toll road projects and Viability Gap Funding (VGF) program are examples of this (box 5.4). Nigeria is an African country that is trying to follow India's lead in a number of PPI areas, and is considering the use of VGF in the power sector. Where countries do not have the internal resources to apply to PPI development, they may be available from donors and MDBs if governments demonstrate a commitment to reduce sector domination by inefficient state-owned enterprises and follow through with such PPI programs.

#### **Box 5.4: India's Viability Gap Funding Scheme**

In 2004, the Indian government launched the Viability Gap Funding scheme (VGF) to enhance financial viability of capital-intensive infrastructure projects implemented as public-private partnerships. Managed by the Ministry of Finance, the support normally takes the form of an up-front capital grant provided at the construction stage.

**Eligibility:** This scheme applies to projects in basic infrastructure sectors such as transport, power, water, sanitation and solid waste, as well as infrastructure projects benefiting special economic zones and tourism. The projects must be developed, financed, constructed, maintained, and operated by private sector companies selected through open competitive bidding. The projects normally generate revenues from user charges for service provision.

**Support:** Individual grants may not exceed 20 percent of the project cost and are disbursed only after the private company has made its required equity contribution. Sponsoring ministries or state governments may provide additional grants from their own budgets, but these may not exceed an additional 20 percent of the project cost. The amount of VGF required by a private sector company becomes the key bid evaluation criterion in procurement.

**Progress:** By 2009, VGF grants had been approved, and bidding completed, for 14 projects. The grant support amounted to US\$775 million, with total project costs of US\$4 billion. In addition, 18 proposals had been given an in-principle approval for support of US\$551 million, and total project cost of US\$2.7 billion. These are projects in highways, metro rail and tourism.

**Issues:** These are up-front grants based on perceived need, rather than based on demonstrated performance, so run the risk of providing perverse incentives to project actors. The cost-effective implementation of the scheme depends on the government ensuring good project design and careful assessments of the affordability and value-for-money of the PPI arrangements supported with grant funds.

- Governments must often take on a forceful leadership role when dealing with external sources of finance (donors, MDBs, non-OECD countries, the private sector), who often focus on their own funding priorities. Successful PPI programs in poor countries depend on maximizing demonstration effects by prioritizing those few project opportunities with strong chances for success – and leaving the rest for public works procurement funded by government budgets, ODA or Non-OECD financiers. Governments must think ahead about which projects will make sense as PPPs and which must be funded in some other way, otherwise they risk losing the best PPI opportunities.
- Although SSA countries generally are not considered to have strong enabling environments for private business, a number of these countries are making steady improvements in this area and can serve as models for the rest of Africa. In the past five years, 85 percent of all countries surveyed by *Doing Business* have improved their evaluation scores, and 25 SSA countries have been included in this group, with four scoring in the top ten worldwide. In addition, 17 SSA countries have been recognized as “emerging nations” in the developing world, leading the way in terms of economic, social, and political reforms (Radelet 2010). These countries are demonstrating that business environments that can facilitate PPI projects can be improved in relatively short periods of time.
- A number of specialized funds or facilities make use of combinations of donor and MDB funding to implement business environment reforms. Examples include the *Foreign Investment Advisory Service* (FIAS), which works to improve “doing business” indicators in developing countries, and IFC’s Private Enterprise Partnership programs, which strengthen the business environment in a number of developing country regions. One of the newest examples of this sort of assistance is the *Investment Climate Facility* (ICF), which uses funding from donors and the private sector to improve specific conditions thought to facilitate investment in African countries, like contract enforcement, financial market development, infrastructure facilitation, taxation and customs, competition, and anti-corruption. These and other facilities are actively working to help governments improve upstream investment conditions in poor countries, but governments must seek out these opportunities and demonstrate a commitment to take seriously resulting recommendations.
- Many African governments have become much more receptive to private participation in infrastructure over the past two decades. Part of this receptivity has been driven by the growing appreciation that infrastructure services need to be improved and expanded. Some of this relates to the challenges posed by the Millennium Development Goals. Some relates to the growing recognition of potential PPI benefits demonstrated by regional groups like the AU, NEPAD, and the RECs. PPI successes in sectors and subsectors like ICT and seaports, and partial successes in rail and power (IPPs), have counteracted notable failures in the water sector (e.g., the Dar es Salaam water lease) and have built partial acceptance and some momentum. The challenge is to keep that momentum going.
- One way to deal with political (or ideological) opposition to PPI projects is by carrying out early-stage preparation to clarify who will benefit from such a project, and by how much. This means looking at a wide range of potential beneficiaries, including government officials (national ministries, local governments, regulators, legislators, etc.), civil society groups (consumer groups, neighborhood associations, local and international advocacy NGOs, environmental groups), customers (existing, future, wealthy, poor, urban, rural, etc.),

and the private sector (operators, sponsors, investors, contractors). PPI projects that are likely to benefit a reasonably large number of such stakeholders warrant political support and are much better able to attract wide public support. Methodologies for conducting this kind of analysis have long been available for use in PPI project preparation (van den Berg, 2000).

- According to AICD, operational inefficiencies of power utilities cost the region US\$2.7 billion per year. To the extent that these inefficiencies can be minimized, through reductions in distribution losses and increases in revenue collections, overall investment needs—and the need for PPI—can also be reduced. In many cases, improving the operating efficiency of state-owned power enterprises should be the first step in PPI programs focused on this sector.

## **5.4 Project-Level Performance Factors**

### **5.4.1 Problems with Cash Flows and Profitability**

The key project-level PPI performance factor is the ability of the project to meet expectations regarding cash flows and profitability. Profitability is often a longer-term objective of such projects—they must be profitable eventually. In the meantime, however, projects must achieve reasonably positive cash flows in order to have cash on hand to pay bills, particularly debt service. If the project cannot generate adequate cash to meet immediate needs, then the private and/or public partners must provide more cash. If they are unwilling or unable to do so, the project experiences a cash flow crisis and becomes vulnerable to collapse. The most frequent response to such a crisis is to renegotiate the contract to relieve pressures on cash flows, by reducing or rescheduling investments, raising tariffs, lowering fees paid to the government, etc. In terms of businesses generally, cash flow crises, rather than lack of profitability, are the most frequent causes of distress and failure. PPI enterprises are no different.

Unfortunately, PPI projects are highly sensitive to problems with cash flows and profitability (these problems are usually the first manifestations of project stresses caused by macroeconomic shocks, as discussed earlier in this chapter). This is a long-standing problem with large, PPP projects in developing countries, which make use of “project finance” techniques. But it is also a problem having particular application to IPPs (Woodhouse 2005a). The project finance technique behind this cash flow vulnerability is the widely-used practice of minimizing investment risk by maximizing the levels of debt used in project financing and creating a special purpose vehicle (SPV) to do the borrowing in its own name, thus protecting the sponsor’s balance sheet from the consequences of loan defaults. But debt service costs are prime factors in increasing the cash flow sensitivity of any enterprise, because unlike dividends earned by equity investors, debt service payments (principal and interest on debt) must be paid according to pre-agreed schedules—they represent a constant, largely inflexible drain on the cash of the enterprise. So by maximizing debt in a project financing, and having a separate SPV issue the debt, private sponsors protect themselves from losing huge amounts of their own money in the event of project collapse. But they also increase the chance of such collapse by making the SPV more vulnerable to cash flow problems.

Lenders who provide this debt normally insist on tightly engineered PPP contracts, including power purchase agreements (PPAs) for IPP projects, which mitigate project risks by shifting them to government partners. But in times of crisis, such measures have not worked well. For example, under the intense economic pressures of the Asian Crisis in 1997, many governments simply refused to honor their off-take commitments, regulatory agreements, or guarantees. Hundreds of PPI projects collapsed.

These concerns about cash flows and profitability continue to be important factors that limit private sector interest in PPI projects, especially in poor countries where governments may be less willing or able to meet financial commitments associated with large projects. If anything, research conducted on this topic since the Asian Crisis shows that potential private partners may not be worrying enough. A study by Guasch (2004) concludes that PPI projects in Latin America have registered a high incidence of renegotiation, about 42 percent, coming on average after only 2.2 years of operation. The results of renegotiation tended to favor operators, mostly with improvements to cash flow and profitability via permitted delays in investment obligations (69 percent), reductions in investment obligations (62 percent), tariff increases (62 percent), and increased pass-through to tariffs of cost items (59 percent).

A second study, by Sirtaine, et al. (2004), looks at the profitability of PPI projects in Latin America during the late 1990s, again using a sample including both brownfield and greenfield projects in water, transport and energy. The study suggests that on average, projects demonstrate profitability only after about 10 years. And 40 percent of the concessions in the sample did not appear to have the potential ever to become profitable—with that percentage increasing to 50 percent for concessions in energy and transport sectors. Only by adding in “indirect forms of dividends” like investment mark-ups, transfer fees, and payments for capital appreciation paid at the end of the contract period can the concessions generate acceptable remuneration for private partners.

The private sector now more carefully avoids PPI projects in poor countries like brownfield electricity distribution concessions, in favor of project structures less likely to experience problems with cash flows and profitability. Projects that are least attractive to the private sector are those with: (i) large cash outflows related to investments with questionable relationships to increased revenue generation, and/or (ii) weak cash inflows associated with the unwillingness or inability of end-users to pay for the full cost of services.

An example of a brownfield concession with both of these negative characteristics would be an electricity distribution project involving (i) costly rehabilitation of poorly maintained existing facilities (for which little performance information is available) and (ii) retail sales to poor end-users who have difficulties paying their bills, or where the possibility is strong that tariff increases will be resisted for political reasons. An example of a greenfield generation project with both characteristics would be an IPP involving (i) expensive debt financing (involving high debt service costs) and expensive fuel arrangements and (ii) wholesale power sales to uncreditworthy distribution utilities that do not charge cost-reflective tariffs to customers, backed by a weak or incomplete PPA that does not denominate payments in hard currency.

#### 5.4.2 Government Actions to Optimize Project-Level Performance Factors

- The project preparation needed to make PPI projects attractive to prospective private partners in African countries involves more than just identifying and allocating risks. In the

post-Asian Crisis world, PPI projects also require structuring to strengthen project cash flows and profitability by (i) reducing large cash outflows, and (ii) making revenue streams stronger or more secure. Such arrangements normally involve more sharing of project costs and risks by government partners (table 5.2). Governments that can handle these costs and risks have higher chances of PPI success.

**Table 5.2**  
Structuring Options for Strengthening PPI Cash Flows & Profitability

<p>1. <b>Reduce large project cash outflows for debt service:</b></p> <ul style="list-style-type: none"> <li>▪ Government <u>on-lending</u> of concessional capital finance to project company.</li> <li>▪ Government <u>grants</u> to strengthen project viability.</li> <li>▪ Government payment of <u>initial restructuring costs</u>.</li> <li>▪ Government assumes <u>responsibility for investment</u>, private partner for O&amp;M.</li> <li>▪ Investment financed from project revenues (pay as you go), rather than debt/equity.</li> </ul> <p>2. <b>Reduce other project costs:</b></p> <ul style="list-style-type: none"> <li>▪ Government-sanctioned <u>delays in operator payments</u> for the use of government assets.</li> <li>▪ Government <u>reduction in fees</u> or taxes.</li> <li>▪ Government-sanctioned <u>delays in investment</u> (or reduction of pressure for early investment).</li> <li>▪ Government <u>remuneration</u> (at end of project) for capital improvements by the operator.</li> <li>▪ Government use of <u>small-scale PPI</u> projects to reduce project costs and risks.</li> </ul> <p>3. <b>Increase or make more reliable project cash inflows:</b></p> <ul style="list-style-type: none"> <li>▪ Government pays for bulk services, but manages distribution and assumes commercial risks.</li> <li>▪ Government (rather than end-users) pays for distribution, managed by private partner.</li> <li>▪ End-users pay for distribution by private partner, but Government tops up if necessary.</li> <li>▪ Government allows private partner to maximize remuneration from available sources (TA, construction mgmt fees, etc.).</li> </ul>
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Source: Author's compilation.

- “Handling” these costs and risks usually means that governments must successfully implement broader sectoral reforms. Most of the structuring techniques described in Table 5.2 relieve project companies of various project risks, or significantly reduce their exposure to such risks, making the projects more attractive to private partners. But in terms of broader public service delivery operations, the risks have just been shifted from the private partner to the government who now must take sole responsibility for managing and mitigating the risks. Under such arrangements the government becomes responsible for finding the money to repay lenders who finance the project investments or for delivering the service to end-users and collecting their payments. But governments are rarely able to manage these risks well – this realization is typically part of the original motivation for considering private participation. So structuring a project with viable cash flows and profitability often means that other, deeper governmental reforms are also urgently needed, which are not at all addressed by the project.
- Some of these measures also increase the vulnerability of governments to things like macroeconomic shocks. For example, reducing or stabilizing IPP costs by taking on fuel supply risk (e.g., guaranteeing fuel at a particular price or allowing pass through of all fuel costs to the government utility that off-takes the power), increases the government's risks in

the event of domestic currency devaluation. Guaranteeing payments for wholesale electricity in hard currency has a similar effect.

- If governments assume or share project investment risks, they may also have to manage conflicts of interest. For example, when governments act simultaneously as financiers interested in the financial sustainability of projects, and regulators charged with protecting the interests of end users, they need to be aware that these roles may conflict. Should a government allow a concession company, in which it has invested substantial amounts of capital, to go into bankruptcy? What if the bankruptcy results from poor performance, including poor customer care? These and other questions need to be anticipated before governments become too deeply involved as PPI project financiers.
- Transfer pricing, investment markups and technical assistance fees have long been a concern for government owners of concession projects. If private partners need to exploit these revenue sources to deal with cash flow and profitability issues, governments must be prepared to monitor and evaluate the process. Sirtaine, et al., suggest that audits focusing on transfer pricing issues have been standard features of more developed PPI markets like Latin America. But Pozzo di Borgo, et al., imply that they are used much less frequently in regions like Africa, where monitoring efforts are weak and the kinds of information that concessionaires must routinely report often are not specified in contracts. This desire of some private partners to maximize construction management costs also requires government monitoring to ensure that the size of these investment programs remains under control.
- Although there is more attention now to structuring projects in order to minimize key project risks, risk engineering that identifies and allocates project risks is still an essential part of PPI project development. PPAs backed by sovereign guarantees continue to be the private sector's risk engineering tool of choice for IPP projects in poor countries. And risk engineering is essential for the success of projects that the private sector sees as fundamentally risky, like brownfield distribution concessions. A variety of risk engineering measures will continue to be necessary on projects where structuring cannot reduce risks to acceptable levels for private partners (box 5.5). But several concerns are worth mentioning in this regard:
  - A large variety of risk mitigation products like credit and risk guarantees are available for use in poor countries. In fact, so many competing and overlapping instruments and facilities exist that officials in such countries have little if any sense of which options meet their needs in the most cost-effective ways. A recent survey found dozens of such facilities at work in the developing world (Matsukawa and Habeck, 2007), but no brokerage or advisory services are available to help governments make choices. The variety of options can be particularly confusing when one development agency offers competing or overlapping products.
  - Governments need to guard against the tendency to view risk mitigation products, like DFI guarantees, as a form of subsidy that can be used to provide up-front support needed to get uncreditworthy projects off the ground. Using guarantees in this way risks long-term negative consequences in the form of market distortion and moral hazard. If guarantees prop up bad projects, financing resources are drawn away from more creditworthy projects and public and private partners begin to lose their

incentives to structure viable, sustainable projects. Project subsidies of various kinds are important in poor countries, but upfront subsidies, not tied to some kind of performance, risk moral hazard.

#### **Box 5.5: Tools to Mitigate Risks Affecting Cash Flows and Profitability**

- **Security measures backing government commitments to support projects:** Governments make many kinds of commitments to support PPI projects. But because private partners sometimes question the strength of these commitments, particularly after the problems with risk mitigation during the Asian Crisis, many of these commitments must be backed by additional kinds of security. For example, most power purchase agreements (PPAs) must be backed by security arrangements such as escrow accounts, letters of credit, targeted subsidies, budget commitments, etc. In countries without domestic capital markets that can finance PPI projects, PPAs often must be denominated in hard currencies such as U.S. Dollars or Euros, indexed to currency baskets or backed by foreign exchange liquidity facilities. Without this, operators are subject to foreign exchange currency risks—local currency of project revenues may depreciate against the foreign currency of project debt.
- **Sovereign government guarantees:** Since the Asian Crisis, investors have often demanded reassurance that a government’s commitments in support of a PPI project are as strong as they can be. This may mean that in a risky project environment it is not enough for a government-owned power utility to sign off-take agreements with IPP project companies – a sovereign guarantee may be required as well. In addition to project off-takes guarantees, governments can and do guarantee many other aspects critical to PPI project cash flows and profitability, including fuel supply, currency convertibility and transferability, interest rates, exchange rates, tariff rates, and revenue levels.
- **Third-party credit and risk guarantees:** Donors, MDBs, as well as private institutions also provide guarantees or insurance products to cover risks that private lenders or investors are unable or unwilling to take.
  - Credit guarantees cover losses in the event of default on debt service regardless of the cause of the default. Development agencies typically provide partial credit guarantees only to public sector borrowers, often with a sovereign counter-guarantee. Credit guarantees can help governments access finance needed to support PPI projects. Private sector borrowers can lower their cost of debt or extend maturities by accessing credit “wraps” from private “monoline” insurers. These products, often used to back project bonds, cover the entire debt service in the event of default, typically on a “no questions asked” basis. But monoline wraps and other forms of credit guarantees for private borrowers are rarely available for projects in LICs, and in any case, the monoline insurance business has yet to fully recover from the recent global financial crisis.
  - Risk guarantees can cover lenders for losses caused by a wide variety of government political and regulatory events ranging from expropriation to government non-payment of contractual obligations (some examples of this were mentioned earlier in connection with the Kenya-Uganda Rail Concession). Development agencies normally provide partial risk guarantees targeted at specific government actions, to give lenders comfort that government support promised to projects will be forthcoming, for example where the project company will rely on the government for the project revenue stream or to supplement payments made by consumers.

## 5.5 How Donors/MDBs Can Help

- In the haste to reestablish their involvement in power sector financing, donors and MDBs have sometimes lost sight of the need to strongly promote private participation in the sector. As some MDBs resumed their sovereign-backed lending programs in Africa’s power sector after the end of the 1990s (after the private sector failed to take on most of the burden of power sector investing) they seem to have found it easier to lend to governments or their state-owned enterprises for traditional public sector projects, thus reinforcing the hybrid reform model being adopted across Africa (Eberhard and Gratwick, 2010). As a result of this, too many power projects in Africa are going through early stage preparation by governments as if donors or MDBs will provide all of the financing. Bankability issues of importance to potential private partners are often ignored until projects are retrofitted later as PPPs—by then it is difficult and expensive to change direction.
- A related issue affecting work on the PPI enabling environment is the fact that the “best practices” in PPI, as well as power sector reform, have undergone considerable change over the last decade, with the development community rethinking orthodox prescriptions in a number of key areas. For example, many experts now recommend against vertically unbundling electricity utilities in small countries, management contracts and brownfield concessions are recommended far less frequently than was the case ten years ago, and “independent” regulatory agencies are no longer seen as straightforward solutions to the problems of political interference in regulation (because few of these regulators are actually independent). Changes are to be expected, but many developing country counterparts argue that recommended reforms since the early 1990s reflect a pattern of uncritical replication of best practices developed and used in industrialized economies, which often are not appropriate for poor countries. Donors and MDBs need to sharpen their understanding of best practice PPI-related reforms (not a natural skill-set in institutions normally focused on sovereign-backed lending). Institutions like the World Bank have begun to do this with special internal “global expert teams” that pull together in one place PPI knowledge and experience from across the institution and make it available wherever it is needed.
- Among other things, African countries need help in comprehensively planning, targeting and prioritizing the use of PPI, ODA, non-OECD finance (mostly from Chinese, Indian and middle-east investors), and own-source revenues. The lack of this kind of planning often means that potentially successful PPI projects are pre-empted by ODA or non-OECD financing, or are attempted in situations where modest efficiency improvements offer opportunities for quick wins.
- Most of the structuring options listed in Table 5.2 involve substantial government financial contributions to projects. In most African countries this kind of government support is not possible without sovereign-backed concessional borrowing that can be passed on to projects in the form of debt or equity. Donors and MDBs could facilitate more PPI projects in these countries by finding ways to allow more of this kind of sovereign borrowing and tailoring it to the needs of PPI projects.



- For example, negative pledge clauses used by some MDBs restrict the ability of borrowers to transform government-financed infrastructure projects into PPI projects (using non-sovereign structured finance) at later stages.
  - MDBs could find ways of encouraging the refinancing of sovereign-backed debt used to support a PPI project with private commercial debt when allowed by market conditions.
  - Some MDBs have restrictions that make it difficult for them to lend to multi-country PPI projects, such as those needed to expand SSA's electricity generating capacity or implement development corridor projects.
  - Donors and MDBs often have different and sometimes conflicting rules governing procurement of private partners on projects involving sovereign borrowing, making multi-donor support for PPI projects complicated if not impossible. The bundling of small PPI projects into pooled concessions for bidding to private companies also presents procurement challenges for some donors and MDBs.
- Donors and MDBs need to harmonize their approaches to the identification of PPI projects. Not infrequently a development partner will select a project for ODA support, which might be a good candidate (usually one of few viable country candidates) for private sector participation. Donors and MDBs should also prioritize PPI projects by type and sector, in order to focus their support on projects requiring the most urgent attention.
  - The potential for PPI project renegotiation, whether handled formally or informally, is something that adds significantly to the costs of these projects in the view of government officials. Several African officials have suggested that donors explore ways of making expert support available for contract restructuring. It would be inadvisable to eliminate incentives for PPI contracting parties to avoid situations where renegotiation is unnecessary, but it is also true that renegotiations often represent a necessary way of adjusting project structures to changing operational realities, rather than always being a signal of project failure. Donors and MDBs are often reluctant to be seen to be advocating project restructuring that may benefit one contracting party rather than the other, but it would be possible to fund third-party assistance providers who would not necessarily represent or reflect the views of donors/MDBs. Finding ways of facilitating necessary project renegotiation would help give government partners more reason to consider entering into such arrangements.

## **6. Addressing the Most Urgent Need: *PPI Project Preparation***

### **6.1 Overview**

PPI project preparation is an over-arching performance factor that warrants its own extensive discussion because of its singular importance. Poor preparation can seriously undermine the viability of a PPI project even if the other main performance factors discussed in the last chapter have been optimized. Good preparation also can help optimize all of these limiting factors: it can demonstrate to governments the benefits of using PPI options, and can help in selecting the best option. Preparation is essential in confirming for potential private partners that projects are commercially viable and can avoid major problems with cash flows and profitability. Sound preparation can also help strengthen enabling environment problems, by carrying out limited reforms as part of the “upstream” preparation process, and structuring contracts to take into account legal and regulatory weaknesses of host governments. A notable example of this last benefit is the use of carefully prepared contractual provisions, like “regulation by contract,” to substitute for weak or non-existent government regulatory regimes.

This chapter attempts to address the following issues:

- Importance of Project Preparation
- What Kind of Preparation Work Must be Paid For?
- How much does Project Preparation Cost?
- Who Normally Pays for Project Preparation?
- What about Existing Project Preparation Facilities?
- What is Needed, How would it be Managed?

### **6.2 The Importance of Project Preparation**

African government officials sometimes ask, if infrastructure investment needs are so large in Africa, and so many projects have been identified by NEPAD, RECs, power pools, corridor authorities, etc., why are so few projects attracting interest from the private sector? The problem is not so much a lack of funding as it is the lack of “bankable” projects—projects in which enough time and money has been invested to establish commercial viability in a way that is compelling enough to attract the private sector. A close look at the original NEPAD STAP list of investment projects (2002) reveals that many of these are of the “wish list” variety. Some were selected for political reasons, with little attention to whether or not public or private financiers considered them to be viable. Often project proposals were backed only by out-of-date engineering studies and involved no additional analysis or preparation. Most of these projects could not be taken forward without more money being spent on preparation and packaging. But such preparation is expensive and risky – many socially or economically desirable projects may not be bankable at all, at least by the private sector, no matter how well structured. Private operators and commercial lenders have money to invest in bankable projects,

as well as to do their own due diligence, but almost no money to contribute to preliminary assessments of bankability.

Ideally of course, rational and fully informed economic actors would not prepare an infrastructure project without confident expectations that the project would be viable and able to generate overall benefits sufficient to outweigh its overall costs, including the costs of project preparation. Various methods of appraising infrastructure projects developed over the last 20 years, such as the value-for-money analysis used in PPP project evaluation in the UK, purport to judge projects on this basis, explicitly factoring in estimates of project preparation costs. But the estimation of project costs and benefits is far from an exact science and many projects are prepared for which viability is less than certain and the quantification of benefits and costs unclear, particularly the final accounting of preparation costs.

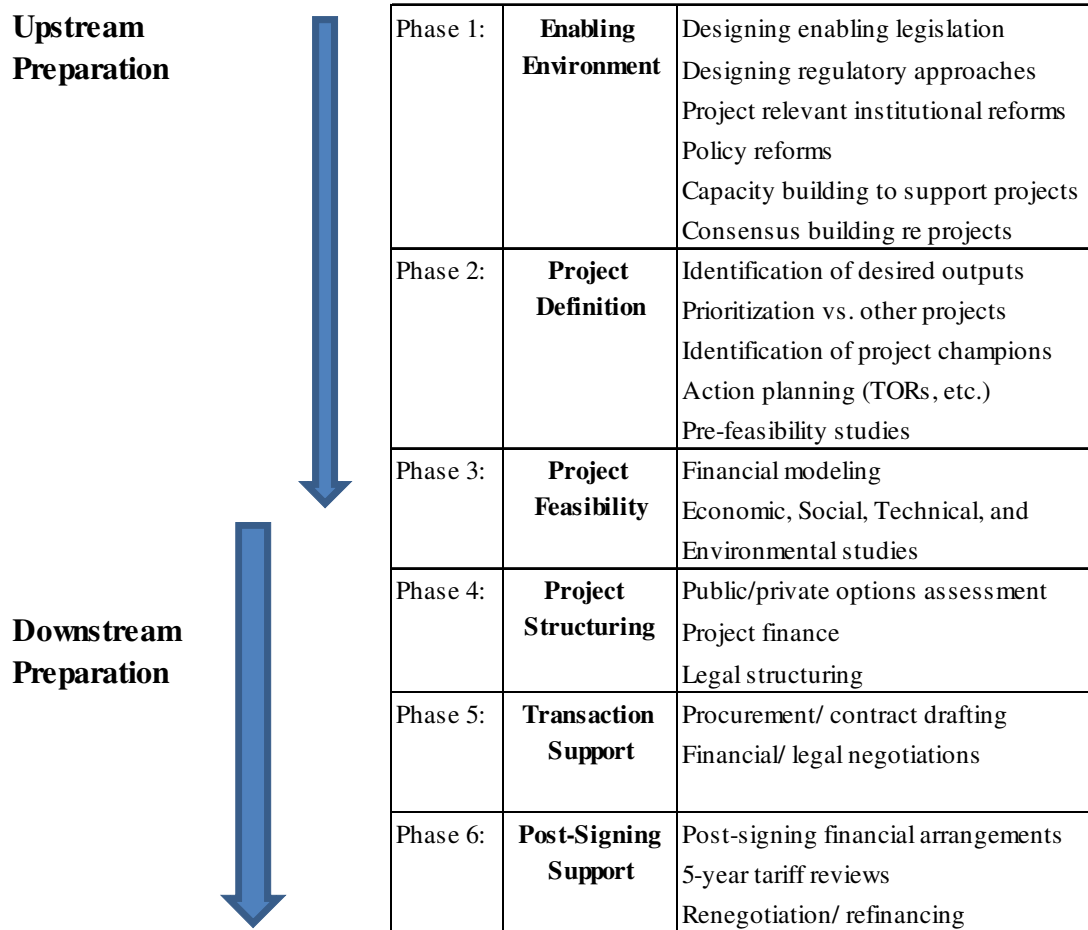
This is especially true of large power projects in low-income country regions like SSA where project preparation, as well as project implementation, often involves many unforeseen costs. In these environments the risk of losing money spent on project preparation reflects a kind of uncertainty that often acts as a barrier at entry, by keeping both public and private participants from moving the projects forward. Under some conditions the uncertainty that keeps projects from moving forward represents a kind of market failure that arguably warrants correction through some form of external support from donors or MDBs.

### **6.3 What Kind of Preparation Work must be Paid For?**

Actors in the infrastructure project marketplace generally talk about two, overlapping kinds of preparation work for large infrastructure projects involving both public and private funding (figure 6.1). The first kind of preparation, referred to here as “upstream preparation,” involves project-specific improvements to the legal and regulatory enabling environment, efforts to meet donor and MDB lending requirements, as well as the initiation of procurement activities. “Downstream transaction work” involves more detailed consideration of the kinds of procurement activities associated with contracting out PPP arrangements and arranging commercial financing.

An important but under-funded element in efforts to prepare African projects has often been “upstream” project preparation. Even if money is available for feasibility studies, the lack of basic legal and regulatory frameworks for the targeted sector can easily stall project development. Incomplete policies, plans, and procedures can have similar effects. It is often difficult to get help for these activities from local or regional DFIs, donors, or MDBs. Donors often support PPP project preparation, but the amounts of funding available are relatively small and donor support for upstream project-specific work is scarce largely because it is risky – it is so far upstream from actual transactions that it may or may not result in financial closure of a deal. This makes the work unattractive to private sector developers, who must recover development costs from completed deals, but also unappealing for donors, who must justify expenditures with tangible results that clearly promote development objectives.

**Figure 6.1**  
Upstream & Downstream PPI Project Preparation



Source: Leigland and Roberts (2007)

## 6.4 How much does Project Preparation Cost?

### 6.4.1 Different Studies, Different Metrics

There is no single widely accepted metric for infrastructure project preparation costs. Costs may be measured as a percentage of initial capital costs, construction costs, or even the total net present value of the deal over its entire lifetime (as in the case of the London Underground PPP). Most published work has focused on “transaction” costs, usually synonymous with “downstream transaction costs” shown in Figure 6.1 above. A sampling of different studies using different metrics follows below:

- The World Bank's Project Preparation Facility allows government clients to pay for upstream preparation with the proceeds of advanced borrowing in amounts up to US\$3 million per project. But one recent Bank project appraisal document points out that this amount is inadequate for preparation of large projects. For example, the government cost of preparing individual expressway projects in Asia greater than US\$1 billion in size (and involving PPP components) would be at least US\$20 million (or about 2 percent of the total loan).
- Similarly, when the World Bank began preparing early stage cost estimates for Inga III, preparation costs were assumed to be about US\$100 million for a total project cost of US\$5 billion (again, about 2 percent).
- For a dedicated government-managed unit established recently in a lower middle-income country to carry out project preparation, the World Bank budgeted costs of US\$85.5 million for US\$4.15 billion in investments (again 2 percent), to be divided among 20 projects (or an average of about US\$4.3 million per project).
- For thermal power projects in Sub-Saharan Africa, World Bank energy specialists assume rule-of-thumb project preparation costs at 3-5 percent of construction costs. For hydro projects, the preparation costs are assumed to be 5-7 percent.
- When preparing its budget for InfraVentures, the IFC found that its own costs for preparing its loans to the private partners on a variety of PPP projects in Africa ranged from 1-4 percent of project cost. InfraVentures was created with an initial five-year budget of US\$100 million to support preparation of eight new projects per year, at an average preparation cost of not more than US\$4 million per project. This involved preparation on the private side of PPP deal, so focused heavily on downstream transaction work. (The IFC assumed that of the 40 projects supported over the five-year period, 24 would successfully reach financial closure.)
- Both the EU-Africa Infrastructure Trust Fund and the Inter-American Development Bank make available up to US\$5 million for preparation of individual projects. In the case of the EU-Africa Trust Fund, this involves grants made to and implemented by project financiers like EIB, KfW, and AfD.
- In a widely-cited study of the procurement-phase costs of bidding and negotiating contracts for 55 infrastructure PPPs in six sectors of the UK economy, Dudkin and Valila (2005) concluded that total transaction costs of this type averaged over 12 percent of the capital value of the projects, with the public sector cost at about 3.5 percent, the winning bidder cost at about 3.8 percent, and costs to losing bidders totaling about 5 percent. The authors point out that winning bidder costs are most often ultimately born by the government in the form of higher project operating costs.
- As would be expected, Dudkin and Valila found that one variable having a significant effect on public sector transaction costs was the length of time needed for procurement and contract negotiation. Projects taking longer than 50 months to conclude this process

had significantly higher transaction costs, approaching 4 percent for the public sector. Costs varied widely from sector to sector, and decreased as a percentage of total costs as total costs increased, suggesting some economies of scale in preparation. The authors found no evidence that experience with PPP project preparation reduced preparation costs.

- Farajian (2010) found lower average transaction costs in several case studies of large transport PPPs in the U.S., but concluded that the transport agencies involved were not reporting all relevant costs. He also found that some state departments of transportation were requiring that project managers budget up to 10 percent of total investment for procurement and contract negotiation.
- Castalia (2010) estimated government transaction costs of PFI school projects in Australia and New Zealand at 10-11 percent of total project construction costs, with significant premiums to be expected for first-time projects in either country. This is noteworthy because both countries have considerable experience with PPPs, and have standardized approaches for project appraisal. Castalia's conclusions suggest that even with PPP experience, projects in new sectors must expect to face considerably higher preparation costs than might be the case in other sectors.
- Using a somewhat unconventional method of estimating transaction costs (again, just the costs of procurement and contract negotiation), the UK House of Commons, Committee of Public Accounts, reported that such costs for the London Underground PPP (£455 million, including reimbursement of bidders' costs) were said to be 2.8 percent of total spending on the project over its 30-year lifespan. However, when measured against the initial private financing raised for the project, the transaction cost figure reached about 9 percent.

#### 6.4.2 Estimating Costs in SSA

This kind of largely anecdotal research does not lend itself to precise estimates of project preparation costs in developing countries. But it does suggest that such costs are high, particularly considering the lack available data needed for feasibility studies as well as the need for considerable upstream preparation in poor countries. Cost estimates for preparing large PPI projects in Africa's power sector would reasonably include the following elements:

- Minimum costs to governments of upstream preparation are likely to be in the 3-5 percent range for large projects up to US\$1 billion in size, with a gradual decrease in preparation cost percentages for projects over that amount.
- Costs to governments associated with transaction work (PPP procurement and contract negotiation) on large projects are likely to be in the 4-5 percent range (assuming some overlap with upstream preparation).
- Total transaction costs for bidders should be 10-12 percent, with the winning bidder expected to spend 4-5 percent and losing bidders the balance.

- New or particularly difficult sub-sectors (like hydropower) or large regional projects involving more than one country, will likely warrant a 2-3 percent premium (shared between public and private partners). Unfortunately this is likely to apply to any large infrastructure project in Africa that combines MDB and private financing because few such projects have been completed on the continent. There have been only two African hydropower PPP projects since 2000 (both under 400 MW in size).

This puts total expected preparation costs of large power projects involving MDB and private sector financing in the range of 19-25 percent of total capital investment. For a US\$500 million power project, a minimum of about US\$95 million would be required for total preparation and about US\$40 million for direct government costs alone.

## **6.5 Who Normally Pays for Project Preparation?**

### **6.5.1 Private Operators, Sponsors, etc.**

Private partners in PPP arrangement arguably need the least amount of help in covering preparation costs because they have several methods for recouping them. External consultants, who prepare special studies, legal opinions, etc., are often engaged at a discount, on a risk-sharing basis. If the bid is successful, these external consultants receive success fees; if the bid is unsuccessful, the consultants share to some extent in the loss of preparation costs. The costs of in-house staff time may be factored into the bid price, or where competitive pressures keep bids as low as possible, may be charged as a cost to the special-purpose vehicle created to operate the facility. So if the bid is successful, most of these preparation costs can be recovered by the private partner. Losing bidders of course typically have no way to recover the in-house costs of preparation, unless they try to recover those costs from existing operations or future bids.

For large projects in risky environments, prospective private partners carefully evaluate both their chances of winning the bid, the costs of preparing the bid, but also any extra costs associated with operating the project. Studies of “transaction costs” as opposed to preparation costs typically include discussions of the costs of project implementation delays, for which governments are often responsible, as well as renegotiation costs in cases where contracts must be restructured at some point after financial closure. While technically not costs of project preparation, and often at least partially recoverable as costs to operating companies, these costs are nevertheless very much on the minds of prospective private partners when they consider bidding for a project. If the likelihood of incurring such costs are high, and preparation costs also are expected to be high, potential private sector bidders are further discouraged from competing for projects.

Opportunities for accessing external funding to cover preparation costs are limited for the private sector, partly because private partners on successful deals have these various avenues for recovering costs. Where governments receive assistance from MDBs for project preparation, prospective private partners benefit. Some facilities exist, like the IFC’s InfraVentures, which provide private partners with early stage risk capital and preparation funding in exchange for equity participation in the project. The purpose of this support is to bring private and PPP

infrastructure projects to the financing stage. InfraVentures attempts to recover these costs by sharing in the project's return if and when it successfully reaches financial closure, either via an equity stake in the project company, or by arranging all or a portion of the project financing.

### 6.5.2 Lenders

Commercial lenders to governments or private partners in PPP arrangements focus almost exclusively on the downstream transaction costs associated with project preparation, and cover such costs on a commercial basis through the pricing of their loan products. But MDBs typically face three kinds of preparation costs on large infrastructure projects in poor countries: (i) activities involving the MDB's own due diligence and other normal lender costs, (ii) activities (like feasibility studies or detailed design work) that ideally should be implemented by the borrower, in order to avoid conflicts of interest in loan preparation, and (iii) upstream legal, regulatory, and policy reforms to the project enabling environment, which are not necessarily related directly to a specific downstream project. MDBs often must somehow deal with all three of these kinds of preparation tasks because their borrowing clients may not have the funding or the expertise to fully carry out their own share of these activities. The first kind of cost (lender due diligence) is normally paid for from the MDB's own budget and factored into the costs of lending in some way. The second kind of cost (to cover the borrower's own preparation) ideally would be covered with grant or advance loan funding for activities executed directly by the borrower, with some guidance by the lender—however, some MDBs simply execute these activities on behalf of the borrower. The third kind of cost (for upstream reforms) sometimes can be covered by grants or loans, and can be executed directly by the lenders or the borrowers.

Beginning in the early 1990s, the World Bank had a source of funding that allowed borrowers to carry out most of their own preparation tasks without the need to use their own money or borrow additional money from the Bank. From 1990 to 2008, the Government of Japan contributed over US\$1.6 billion to a Policy and Human Resources Development (PHRD) Fund managed by the World Bank. The money was used by World Bank clients in the form of nearly 3,000 recipient-executed project preparation grants – more than 30 percent of all World Bank operations over this period benefited from these grants (which averaged about US\$650,000 over this period).

With the end of Japanese funding for PHRD in 2008, the Bank has used several mechanisms for supporting borrower preparation costs. One is to approve a loan without first preparing individual sub-projects, and then use part of the loan proceeds to carry out sub-project preparation. Another approach is to use a Bank loan product (called a Project Preparation Facility), which advances some portion of an anticipated project loan to pay for client preparation costs. This PPF allows sub-projects to be prepared in advance of overall loan approval, giving the Bank and client a much clearer picture of what will be done with the proceeds of the overall loan. PPF advance loans can be up to US\$3 million each, but must be repaid if no overall project loan results. On occasion the Bank also uses special technical assistance loans to create preparation funds or facilities in individual countries, which they prepare a series of individual projects. Middle-income countries are increasingly willing and able to pay their own preparation costs.



The Inter-American Development Bank (IDB) uses several similar programs to assist clients with project preparation in Latin America. IDB's Project Preparation Facility provides up to US\$1.5 million in complementary financing to help with project preparation. The Project Preparation and Execution Facility makes available up to US\$5 million per project for preparation activities. A third IDB facility, the InfraFund, helps public, private and mixed entities identify, develop and prepare bankable infrastructure projects.

The EU-Africa Infrastructure Trust Fund was created to provide grant funding to help prepare infrastructure projects with regional or trans-national dimensions in Sub-Saharan Africa. These are intended to be projects co-financed by European development finance institutions and the European Union. Grants normally range from US\$250,000 to US\$5 million (although they can be larger) and cover feasibility studies and other technical assistance, payment for project components that provide environmental or social benefits, insurance premiums to mitigate project risks, and partial interest rate subsidies. These are grants made to, and implemented by, project financiers to cover a mix of preparation activities across the three types of preparation mentioned above. The lead financiers on most of these projects to date have been EIB, KfW, and AfD.

### 6.5.3 Governments

In developed economies, governments normally expect to use their accumulated data on service provision and existing capital plans to serve as the basis for feasibility studies and project appraisals, the costs of which ultimately can be recouped (or justified) via the economic and financial benefits generated by the project. For PPPs, such benefits would also be expected to include fees and taxes paid by the private partner to the government owner of the facility. Because data on actual or similar service operations is so important for assessing the bankability of a new project, and so many project risks are associated with the construction phase of a new project, brownfield projects involving the rehabilitation or extension of existing infrastructure facilities are considered much less risky in developed economies than greenfield projects involving the construction of new facilities.

But the situation in poor countries is different. Even in cases where a government is willing and able to undertake full feasibility studies to determine the key elements needed for projects to meet public needs in a sustainable fashion, the task often turns out to be extremely challenging. Management information and basic record-keeping in various sectors is often non-existent, making planning difficult for both brownfield and greenfield projects. Even customer records are often incomplete or missing—there often is no way to tell how many end-users are even connected to service systems, for example, much less paying their bills.

This lack of data makes preparation of infrastructure projects in low-income countries difficult, expensive, and time consuming. For PPP projects, this lack of existing information leads to a perverse situation in many developing countries where private partners would often rather compete for greenfield projects than brownfield ones, because despite the increased costs and risks associated with constructing new facilities, at least private partners can estimate what those costs will be. For brownfield projects in such countries, the lack of operating information means that the risks of unforeseen rehabilitation costs are very high. Brownfield PPP projects represent

the one kind of infrastructure PPP that has never recovered to its pre-Asian Crisis levels—in terms of numbers of projects and investment, more is done via greenfield projects in the developing world than via brownfield projects (Leigland 2008).

In the 1990s, many governments exploring PPPs handled the costs of project preparation in light of their lack of reliable operating information by simply leaving all appraisals and feasibility studies to the private sector. This was often justified with the argument that the PPP concept means that government problems with infrastructure are being fully handed over to private companies for solution. For policy makers (as well as many donors and development agencies in the 1990s) this hand-over meant that there was no need to spend time or money preparing long-term PPP projects, doing feasibility studies, assessing contracting options, etc. In many of the contracts signed in the 1990s, all of this work was assumed to be the responsibility of potential private partners; part of their normal bidding due diligence, because if the project ultimately failed, it would be at the sole cost of the private partners. The Asian Crisis demonstrated the dangers of this kind of logic.

Just as MDBs like the World Bank insist that clients manage their own initial feasibility studies and project appraisals to insure reasonably independent and objective advice, development professionals are now in wide agreement that when it comes to PPP projects, governments also need to have independent, objective feasibility studies and project plans in order to clarify the objectives of the projects and evaluate bids. For brownfield projects involving existing facilities that often are over 50-years old, governments need assessments of the condition of the existing assets in order to be able to compare and evaluate rehabilitation proposals. For greenfield projects, governments need careful identification of the kinds of project outputs needed to meet service delivery needs. By leaving such assessments to bidders who spend different amounts of time and resources on feasibility studies and asset reviews, bids often have been difficult to compare, especially when some of them are based on incomplete or inaccurate estimates of infrastructure investment needs.

Governments have several options for covering project preparation costs. As noted above, for MDB-funded loan projects, countries may be able to access advances on loans, grant funding, and other kinds of assistance arranged by their lenders. Some MDBs carry out these preparation activities on behalf of borrowers, covering their costs from grant funds (like the EU-Africa Infrastructure Trust Fund) or from advances on loan packages. Middle-income countries increasingly use their own funding for these purposes.

Countries can also engage IFC Advisory to provide transaction assistance on PPP projects. This assistance must be paid for on a full cost recovery basis, but IFC does have access to some donor grant funding to reduce these costs for low-income country clients. Countries may also use other kinds of donor resources either directly via bilateral programs or through multi-donor trust fund programs like PPIAF, WSP, GPOBA or several of the PIDG facilities (box 6.1).

Various project preparation facilities also been established, typically with donor support, by African DFIs and Regional Economic Communities. AfDB hosts the NEPAD Infrastructure Project Preparation Facility (IPPF), with support from the UK, Germany, Japan, Canada, and

others. AfDB also hosts the African Water Facility. DBSA hosts several facilities for development of regional projects including a fund supported by AfD. RECs like ECOWAS,

### **Box 6.1: Donor-Supported PPI Project Preparation**

Since it became clear in the late 1990s, that the global PPI market would not recover quickly after the Asian Crisis, particularly in emerging economies, international development organizations began establishing dozens of initiatives designed to assist with infrastructure project preparation in the developing world. Bi-lateral donor agencies (e.g., DFID, SIDA, KfW) have designed special programs to provide support of this kind, as have European development finance institutions (e.g., CDC, DEG, FMO). Multi-lateral trust funds managed by the World Bank have also been created with donor support to focus on specific sectors or types of projects (e.g., PPIAF, WSP, GPOBA). And the World Bank Group itself has created numerous facilities that deal with different aspects of project preparation and finance (e.g., IFC Advisory, MIGA). Addressing a much-needed market gap, several years ago IFC allocated \$100 million to *Infra-Ventures*, a new fund that assists private sponsors with pre-feasibility studies and risk capital. More recently, the European Union has created the EU-Africa Infrastructure Trust Fund to provide grants for the preparation of regional infrastructure projects in Africa.

Donors have also helped African organizations of various kinds set up their own infrastructure project preparation facilities. The French development agency (AfD) has helped create such a facility at the Development Bank of Southern Africa (DBSA) in Midrand, South Africa. The African Development Bank (AfDB) in Tunis has established the NEPAD Infrastructure Project Preparation Facility (IPPF), with initial funding from CIDA, and subsequent support from DANIDA, NORAD, DFID and Sida. AfDB also granted IPPF US\$10 million from its net profits. Regional Economic Communities (RECs), like ECOWAS, COMESA and SADC, are also working with donors and MDBs to establish project preparation facilities to deal with cross-border infrastructure projects in their regions.

Perhaps the most active single group of donors working in this area is the Private Infrastructure Development Group (PIDG). PIDG is a multi-donor, member-managed organization officially constituted in 2002. Current members include the development agencies of the Governments of Austria, Ireland, The Netherlands, Sweden, Switzerland, and the United Kingdom. The World Bank Group, currently represented by IFC, and KfW of Germany are also members. Since 2002, PIDG has helped to create seven facilities (programs, investment vehicles, and affiliates) dedicated to the provision of financial, practical, strategic support to encourage private infrastructure investment in developing countries, which contributes to growth and poverty reduction.

A hallmark of the PIDG approach is the use of donor money to incentivize private sector-like project development. DevCo subsidizes the costs of IFC Advisory work in “frontier” economies. InfraCo operates as a private project development company that acquires the rights to projects, develops them, then sells them to other private operators and investors. Profits from these sales are then re-invested in InfraCo operations.

Critics sometimes suggest that there are too many of these facilities, most of them without enough funding to have significant individual impacts in developing country regions like Africa. Also, most of these facilities are able only to provide support to a specific part of the project preparation lifecycle – there is no ‘one-stop-shop’ that is able to provide support from project inception to financial closure. It is therefore common for an organization preparing a project to have to seek funding from several of these sources.

While donors consider ways to simplify and streamline the landscape of facilities, the immediate problem for governments of poor countries is to understand what kind of help with preparation is available. The Infrastructure Consortium for Africa (ICA), headquartered at the AfDB, sponsored a survey of donor-funded project preparation facilities active in Africa. ICA is an association of G8 countries, the European Union, the World Bank, and the African Development Bank as well as other African counterpart institutions set up to address infrastructure financing problems on the continent. The ICA Secretariat, with funding from the PPIAF, inventoried 26 donor-supported project preparation programs, and prepared a users’ guide to help identify and access appropriate funding sources. The guide is posted on both the PPIAF’s website (<http://PPIAF.org>) and the ICA website (<http://www.ICAfrica.org>).

SADC, and COMESA are in the process of establishing project preparation facilities. NEPAD has been transformed into a project planning and coordination agency under the auspices of the African Union (and is now known as the NEPAD Planning and Coordinating Agency or NPCA).

Many national governments in Africa have also established PPP (box 6.2). But the classic PPP unit model, developed in the UK and Australia, and imported in impressive fashion by South Africa's National Treasury, does not actually involve project preparation. Instead these units regulate the process of PPP project development in order to ensure control over the contingent liabilities that governments face after projects reach financial closure (Irwin and Mokdad, 2010). Even when such units are created with broader mandates that include hands-on preparation, they struggle to source adequate funding and expertise, and must somehow avoid the fundamental institutional shortcomings that drive many countries to consider PPI in the first place.

Most of these facilities, whether managed by MDBs like the World Bank, national governments, or by African DFIs and regional entities, face severe limits on the amounts of funding they can make available for the preparation of individual projects. For example, PPIAF has established a formal limit of US\$1 million on its individual technical assistance grants, but rarely approves more than half of that for particular activities. Other facilities, like IFC Advisory or InfraCo are inclined for various reasons to work with modest size projects. And in addition to these limitations, many of these facilities have had difficulties working together (see the section 6.7 below).

## **6.6 What about Existing Project Preparation Facilities?**

In 2006 the Secretariat of the Infrastructure Consortium for Africa (ICA) and PPIAF collaborated on a survey of donor-funded infrastructure project preparation facilities active in Sub-Saharan Africa. The resulting study, identifying 26 facilities, became a widely-used reference guide available on both the ICA and PPIAF web sites ([www.PPIAF.org](http://www.PPIAF.org)). Among other things, the study also encouraged the ICA Secretariat to think about ways of bringing different facilities together to help prepare large infrastructure projects on the continent. Figure 6.2 below, prepared in 2006, is one of the first attempts by the ICA Secretariat to map some of these key facilities against the typical preparation tasks needed to initiate large infrastructure projects.

### **Box 6.2: Government PPP Units**

Since the end of the 1990s, many governments in developing countries have followed the lead of countries like the UK, Australia, South Africa, etc., in establishing specialized units for developing, supervising the development of, and/or monitoring the implementation of PPP projects that present significant contingent liabilities for government owners. The sort of low-cost project preparation that was characteristic of PPP projects in the early 1990s is less common today, particularly in MICs. Some of these governments have created PPP units to supervise required steps in project development, including the use of technical feasibility studies, PPP option assessments, and cost-benefit analyses.

Low-income countries are also creating PPP units, mostly with the help of donors. Over the last few years, African countries like Kenya, Tanzania, Uganda, Malawi, Zambia, Mozambique, Ghana, and Nigeria have begun exploring the possibility of setting up such institutional arrangements. These units represent steps forward in terms of government understanding and ownership of PPI project development. But lack of experience with or knowledge of PPP project development (on the part of some donor-funded consultants as well as their government clients) sometimes leads to unintended consequences. Governments sometimes over-staff such units with expensive experts only to find that they are unsustainable without large, long-term sources of donor grant funding. In many cases, units need effective project managers rather than financial experts or transaction advisors who are difficult to recruit and even more difficult to retain.

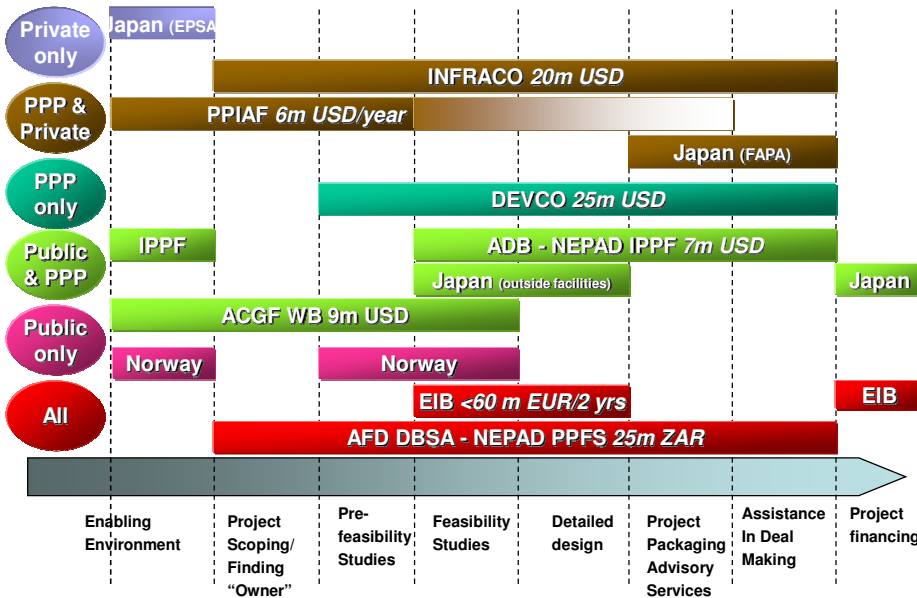
Governments also often misunderstand the institutional conflicts of interest that can be created by combining too many primary functions in a single organizational unit. Regulation of project development is inconsistent with facilitation of deal closure. Facilitators and regulators probably also should not be in charge of government investment money because of opportunities to structure deals in ways that promote investment returns at the expense of stakeholder benefits. Developers and facilitators should not be evaluators for obvious reasons. So-called “Chinese” walls have been established to separate functions in some facilities, but the effectiveness of the separation is sometimes questioned.

Perhaps above all, governments often over-estimate the ability of such units to accelerate deal flow. Such units sometimes produce exactly the opposite result – the flow of deals slows down because of the perceived need to carefully apply standardized procedures in project development. Better prepared projects should be more sustainable, and that should off-set lengthy preparation periods. But governments are sometimes disappointed when their newly created PPP units appear to be slowing down the pace of new deal completion. Of course, disappointment often leads to attempts to circumvent established procedures, sometimes with the tacit approval of senior officials, and this undercuts the authority of the PPP project development regulatory frameworks.

The emergence of government PPP units has been paralleled by a growing new body of guidance on the use of cost-benefit analysis specifically for PPI projects. The most advanced examples of this are available from industrialized countries that have adopted variations of the so-called “PFI model,” developed in the UK in the early 1990s as part of a framework for regulating the development of PPP projects in that country under the auspices of the “private finance initiative.” This approach is essentially a method for justifying a PPI project by comparing traditional government provision (the “Public Sector Comparator” or PSC) with PPP options in terms of a cost-benefit analysis that is broken down into analyses of “affordability” and “value-for-money.” One benefit of this approach is that it is now being used in several countries, all of which have developed valuable background technical guidance that is available on websites. A relatively well established state-of-the-art in government assessment and management of these kinds of issues is now widely available from PPP units in countries like Ireland, Scotland, Australia, Canada, and South Africa. Much of this guidance material is available from internet Web sites.

These sophisticated methodologies are not yet well established in LICs, although the use of such techniques in South Africa has exposed them to some of the other countries in the SADC region. But questions remain about whether such methodologies are appropriate or cost-effective approaches in poor countries, particularly at a time when developed countries are beginning to rely less on quantitative indicators (like PSCs) and more on qualitative ones. (See Leigland and Shugart, 2006, for a discussion of the suitability of PSCs in LICs.)

**Figure 6.2**  
The Tunnel of Funds



Source: ICA Secretariat

The experience since 2006 with efforts to operationalize this so-called “tunnel of funds” concept highlights a number of obstacles that have severely limited its effectiveness.

- As noted earlier in this paper, most of these facilities have relatively small amounts of money to allocate to individual projects, especially when compared with the size of preparation support needed for large regional PPP projects. The EU-Africa Trust Fund offers perhaps the largest amount for single activities at US\$5 million. InfraVentures allocates no more than US\$4 million per project for preparation on the private sector side of PPP projects.
- The small funding amounts reflect a cautious attitude on the part of several of these facilities toward large, regional projects. Facilities like PPIAF, IFC Advisory, and InfraCo all focus on relatively small PPI projects because their experience has indicated that such projects reach financial close far faster and with much less risk of failure than large projects. As donors increasingly expect to see quantitatively measurable performance results from these facilities, the need to link donor-supported work to the financial closure of projects has increased, as has the reluctance of these facilities to take on large or regional projects.

- Most of these facilities have limited experience working together and in some cases compete with each other for assistance opportunities. In any case, few of them have crafted arrangements for collaborative work, such as mechanisms for co-financing, much less blending of funds. Because PPIAF works almost alone in the upstream project preparation environment, it has a track record of early stage work on projects later taken forward by IFC Advisory or other transaction-oriented facilities. But this work has been largely sequential and has not involved direct coordination or collaboration.
- The business models of these facilities are often different in ways that make collaboration difficult. For example, IFC Advisory and InfraCo both engage with clients through sole source mandate processes – neither facility competes for advisory work. But other facilities, like PPIAF, can directly support government transaction work only when it is bid out on a competitive basis. Application and approval procedures are also different and sometimes time consuming. Stitching together support from several of these facilities has proved to be complicated and time consuming.

The universe of these donor-funded project preparation vehicles active in Africa is made up of a disparate mix of relatively small facilities without much incentive to work together. The transaction costs of linking these facilities in a “tunnel of funds” would likely be high and would contribute to the overall cost and complexity of large-scale project preparation. Nevertheless, this universe does represent preparation funding that is desperately needed for high priority infrastructure projects in Africa. If additional external preparation support can be arranged for PPI projects, one aspect of that support could be to help initiate and manage targeted collaboration between carefully selected existing facilities.

## **6.7 What is Needed, How Would it be Managed?**

Much more external grant funding and technical expertise is needed to assist governments with project preparation. Without such assistance, some large projects in low-income countries are still likely to proceed, if only because of the desperate need of some governments to address infrastructure service inadequacies. But the overall costs of preparation, and the time needed for preparation, are likely to increase substantially, matched by a parallel decline in project quality.

The World Bank has found that slow project start-up and readiness is a major cause of project delays and cost increases. Slow start-up, in turn, often results when governments must borrow money for preparation funding—this prompts them to use a sequential approach to project preparation tasks. This means that preparation steps are done one at a time, with a new step taken only when that last is completed and new money is sourced for the next step. Grants facilitate less risk-averse behavior on the part of governments, allowing a broad range of government preparation activities to be carried out prior to or in parallel with processing of main project financing by MDBs and/or private financiers, including government financial and technical feasibility studies, detailed design work, safeguard activities as well as basic procurement. After the World Bank lost its principal source of grant funding for client project preparation several years ago, this sequential approach adopted by many client countries increased the preparation time on Bank projects by as much as 24 months. The high costs of project preparation in risky countries or subsectors (like hydropower), or for complex regional

projects involving more than one country “owner,” of course exacerbates this problems with sequential preparation.

On the private sector side, the IFC experience that led to the creation of InfraVentures suggests that while potential private partners in PPP projects may have the technical and financial resources to carry out their own transaction preparation, they are increasingly reluctant to do so as the size of the project increases. Larger projects, or projects in risky sectors mean more must be risked on project preparation and more must be recovered from project operation if the bid is successful. As the size of the project increases and bidders are expected to cover the costs of all of their downstream transaction work, the number of bidders is likely to decrease, possibly leading to a less than optimal private partner selection.

The preceding discussion suggests a number of conclusions:

- Additional external grant support is needed for the preparation of large infrastructure projects in Africa, particularly PPI projects in the power sector. This support is not needed to replace existing donor-funded facilities, but to supplement the funding they have available and help coordinate a more collaborative approach to preparation involving a wider range of the facilities that populate the “tunnel of funds” described above.
- Most of the new external support is needed to help cover the public sector costs of preparation, although in some sub-sectors like hydropower, or for particularly large and risky projects, some private sector support is probably also warranted, perhaps on a cost-reimbursement basis involving winning bidders.
- Ideally the public sector preparation supported by these grant funds would be carried out on a client-executed basis by the host governments, with guidance (possibly including no-objections on key decisions) from one or more of the participating MDBs.
- The funding would focus on preparatory action that could be carried out in advance of the signing of MDB project loans. This could include several kinds of work:
  1. Activities like financial and technical pre-feasibility and feasibility studies, detailed design work, as well as safeguard activities, procurement preparation and early-stage procurement implementation;
  2. Technical assistance needed by public sector project managers to set up managerial, financial management and procurement support systems required to accommodate the requirements of MDBs and DFIs likely to be involved in any large project;
  3. The identification of additional key preparation tasks requiring upstream preparation funding (such as legal and regulatory reforms); and
  4. The identification and coordination of other sources of grant funding (directly from donors or from donor-funded preparation support facilities) that could contribute needed funding for upstream preparation.



- This funding would probably be best managed on a trust fund basis, hosted by a facility managed by a regional DFI, an MDB, or some kind of multiple donor arrangement.
- Funding for this facility could be made available on a three-year pilot basis.
- A new trust funded facility of this kind could not be expected to cover the full costs of even government preparation of a large infrastructure project, which this paper estimates at US\$40 million for a US\$500 million project. But US\$15 million for a project of this size would cover most of the advanced preparatory work described above, and help avoid government adoption of the sequential approach to preparation. MDB loans and other grant funding could cover the balance needed for preparation.
- An initial trust fund capitalization of US\$300 million would be enough for the facility to work with four to six large power projects per year over its three-year pilot period.

## 7. Conclusions

### 7.1 Overview

SSA's power sector is in crisis. Over 60 percent of all infrastructure investment needs are in the power sector. And this sector's crisis exacerbates the development crisis across the continent because of power's critical role in stimulating productive capacity in other social, economic, and commercial sectors. Power makes a disproportionate contribution to the productivity of the health and education sectors, manufacturing and industry, household activities and quality of life, as well as transport, water, sanitation, and information technology and communications.

The private sector not only can help meet these investment needs, it must help—other sources of financing (including ODA, non-OECD financing, and government budgets) cannot begin to meet the financial challenge of supplying the kind of power infrastructure needed to solve this problem. Some African countries can meet their own power needs by developing small projects without private sector involvement. But countries with deficient power resources need to take advantage of power trading to meet their needs and that will not be possible without huge regional hydropower projects that are well beyond the capacity of most individual SSA countries to develop and finance, even with donor and MDB help. The private sector must be part of this process.

The private sector has proven that it can help in other regions. Almost half of PPI-related investment in all developing country regions is in the power sector, and PPI in power has had a respectable track record in Africa. But only about 3 percent SSA's PPI is in the power sector. The reason for this is that any kind of PPI is difficult to do in poor countries. However it is not so much a lack of will or investment finance that keeps donors and private investors from driving development in the power sector, but a shortage of bankable projects—projects for which commercial viability has been compellingly demonstrated through technical and financial assessments. Once bankability is established, financing is relatively easy.

Inadequate project preparation is gradually being recognized as a key factor limiting progress of many of the priority PPI projects in Africa. African policy makers are also learning that they face special obstacles when it comes to project preparation: this work in Africa requires more of a focus on upstream preparation because of weak enabling environments and investment climates, and more money to address upstream issues and cope with the lack of information on needs, performance of existing facilities, and customers (current and potential). In addition, more project finance and transaction expertise is necessary than in some other regions because of the huge mix of financing sources required for large projects in SSA and the risky nature of the project environment. Although many donor-funded support facilities exist, they are too small and too narrowly focused to be of much help—not surprisingly, simply understanding where to go for help is a challenge for most government officials.

Large amounts of grant funding are needed for project preparation in SSA, and this can only come from donors and MDBs who must be prepared to recognize that the existing structure of

small preparation facilities is not working. Funding must be scaled up, combined with preparation expertise (that most PPP units and project development facilities currently do not have), and focused on commercially viable, priority projects that reflect regional as well as national objectives. The rest of the economically and socially desirable infrastructure projects can be left for support from ODA or non-OECD financiers.

## 7.2 Project Priorities, Challenges, and Key Success Factors

Based on the analysis of this paper, generalizing across SSA, and assuming adequate resources for project preparation, priority PPI projects in the power sector include the following:

### 7.2.1 Regional hydropower projects

**Importance:** These are highly important because cross-border power trading would increase the commercial viability of large projects that exploit hydropower, representing by far the largest untapped source of power in Africa. Power trading would make large regional hydro projects commercially feasible, facilitate private investment, and allow countries without power resources to import low-cost power to meet their needs.

**Challenges:** Trading means that countries with hydropower potential would become exporters of power and others importers—many African countries would have to reconcile themselves to a situation in which they were not responsible for most of their own energy security, and cede some planning and investment authority to power pools or other regional bodies.

**Key success factors:** National governments must drive these projects. Regional bodies need to make a compelling, non-threatening case for trading to national officials—in terms of regional benefits, but also in terms of national welfare.

### 7.2.2 Brownfield concessions in energy transmission and distribution

**Importance:** These are urgently needed to cope with the massive asset rehabilitation needs in Africa, which also restrict the effective expansion of power generation. AICD estimates that 60 percent of existing power assets in SSA require major refurbishment.

**Challenges:** Such projects are generally unattractive to the private sector because the existing government service delivery operations are so inefficient, accurate information on the status of existing assets and customer bases is often inaccurate or incomplete, government regulators are often unwilling or unable to set cost-reflective tariffs or allow disconnection for non-payment, and government generation of power for sale to the distribution concessionaires is often unreliable and/or too expensive. In addition, private concessionaires are reluctant to make major infrastructure investments because they worry that governments will be unwilling or unable to reimburse them for unamortized assets at the end of the concession period.

**Key success factors:** Third-party guarantees and risk insurance can help mitigate some of these risks from the private sector perspective, but such measures also increase the pressure on

governments to ensure that sector reforms are in place, along with appropriate investments in generation and transmission.

### 7.2.3 Greenfield electricity generation projects (IPPs)

**Importance:** These are important because of the massive and rapidly growing need for new generating capacity in SSA. IPPs have performed reasonably well in Africa and offer value for money when compared with traditional government-owned and operated generation.

**Challenges:** IPPs in SSA tend to be smaller than in other regions and somewhat more expensive as a result. They still play only marginal roles in Africa's power sector despite the need for new generation, largely because most governments still allow government-owned utilities to dominate the power sectors in their countries.

**Key success factors:** (i) Political leadership must be willing to reduce the roles played by inefficient state-owned generating companies; (ii) like all PPI projects, IPPs need to be structured to minimize costs (debt service costs, fuel costs, urgency of equity returns) and maximize (and secure) revenues (via well structured and flexible PPAs, creditworthy off-taking distribution utilities, etc.); (iii) regional power projects can increase the size of IPPs, but face the challenges outlined above.

### 7.2.4 Management and lease contracts

**Importance:** These arrangements can help improve operating efficiency and service quality—service system characteristics that need urgent attention in SSA because of massive inefficiencies in government-owned and managed operations.

**Challenges:** Even though these contracts typically do not involve capital investment, they are nevertheless complex agreements that are relatively expensive to structure in a way that optimizes benefits for stakeholders. Such contracts also sometimes become lightning rods for other sector problems (like lack of investment) that are beyond the control of the management contractors.

**Key success factors:** Donor or MDB funding is usually needed to structure these arrangements properly. Performance targets written into these contracts must focus on areas of most importance to a wide variety of stakeholders, including customers (interested in customer care), rather than just donors or MDBs (interested in revenue collection). To take full advantage of the benefits that these kinds of agreements offer, governments need to recognize what the contractors can and cannot be held responsible for—and governments must take responsibility for the broader sector reforms that remain under their exclusive control.

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