

Operational Guidance for World Bank Group Staff

# Public and Private Sector Roles in the Supply of Electricity Services



THE WORLD BANK  
GROUP



The Energy and  
Mining Sector Board

## **ACKNOWLEDGEMENTS**

*This Note, a joint product of the Energy and Water Department and the Infrastructure Economics and Finance Department, was prepared by a team consisting of John Besant-Jones, Clive Harris, Gary Stuggins and Alan Townsend. The note has benefited from considerable input from staff in the World Bank Group (IBRD/IDA, IFC and MIGA) and has been cleared by the Energy and Mining Sector Board.*

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# Public and Private Sector Roles in the Supply of Electricity Services

**The World Bank, Washington, DC**



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## FOREWORD

It is now recognized that under the poor governance standards found in many developing countries, pure public financing of electricity infrastructure and provision of electricity services has failed to adequately support economic and social development. It is now also recognized that the private sector can deliver efficient investments and improved services provided that the right business incentives and legal and regulatory arrangements are in place to attract investment. However, private investment in the power sector in developing countries peaked in 1997 and has since declined to less than one sixth of peak levels. Difficulties in sustaining reforms to establish the power sector on a commercial footing in some countries, a wider reduction in investment flows to emerging markets, and the withdrawal of investors have produced a more difficult climate for attracting private investment in developing country power sectors.

This has led to a search for practical solutions for public-private partnerships for financing of electricity infrastructure and provision of electricity services that lie between the purely public and purely private models.

This Note provides guidance to World Bank Group staff on assessing the suitability of available options for public-private roles in the financing and provision of electricity, and the main steps which staff should take to analyze these options. It cautions against prescriptive, one-size-fits-all recommendations, recognizing the variations in context across the Bank client countries. The note links the different public-private models with appropriate World Bank Group instruments, including project-specific, sector-wide and broader interventions.

As we accelerate the implementation of the Infrastructure Action Plan, the Note provides a framework within which staff can design operations in a way that will enable us to maintain the quality of our interventions.

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## EXECUTIVE SUMMARY

<i>Context</i>	The Bank's Infrastructure Action Plan sets out a series of measures to revitalize the Bank Group's infrastructure business. These measures require the Bank to provide its clients with broad menus of options for public and private sector provision of infrastructure services. Following the recent OED/OEG/OEU review of Bank Group activities to promote private sector development in the electric power sector, the Committee on Development Effectiveness (CODE) requested that guidance be provided to staff on the appropriate roles of the public and private sectors in the provision of electricity services. This will enable Bank staff to assist governments in fashioning strategies to attract the investment required to meet growing demands for electricity.
<i>Purpose of the Guidance Note</i>	The Note provides guidance to Bank Staff on assessing the suitability of available options for public-private roles in the financing and provision of electricity, and the main steps which staff should take to analyze these options. It cautions against prescriptive, one-size-fits-all recommendations, recognizing the variations in context across the Bank client countries. The note links the different public-private models with appropriate Bank Group instruments, including project-specific, sector-wide and broader interventions.
<i>Organization of the Note</i>	The report is organized into three sections: (1) a Context and Background section, summarizing the industry and institutional developments which demand a coherent Bank Group response; (2) a discussion of Sector Reform Options, analyzed along the dimensions of public and private roles, sector and corporate governance, market structure, regulation, access and affordability, and environment; and (3) Strategies for Bank Group interventions, presented in a matrix at the back of the note.
<i>Key Messages</i>	For most Bank client countries, reform of the electricity sector will be at the heart of efforts to improve efficiency, raise service quality, expand access, and power economic growth. Bank staff will need to consider the full range of options from pure public interventions to pure private, but for most countries public-private approaches - in which public interventions are specifically designed to leverage private risk capital and skills - are appropriate. The course that power sector reform takes, and the speed at which reforms can be implemented, will vary from country to country, but reform will be a continuous and evolving process.
<i>Generation</i>	<p>Private financing, whether from local, regional or international investors, is preferred. Most governments can create a substantial role for private generators within their sector development strategies. Nonetheless, public support, in the form of IDA/IBRD guarantees and other forms of credit enhancement, will be a critical component of many private financings in the generation, along with IFC and MIGA products.</p> <p>A strong public financing role may be vital for countries in transition and for large hydroelectric undertakings, with complex economic, social, and environmental characteristics. Staff should assess carefully the rationale proposed for IBRD/IDA lending for generation projects, and consider whether other Bank instruments or interventions in other subsectors (e.g. distribution) may be more appropriate.</p>
<i>Transmission</i>	Depending on country policy and sector circumstances, there are substantial lending, guarantee, and insurance opportunities for the Bank, IFC, and MIGA. The Bank could commit lending to state-owned transmission companies, as a key component of an overall sector development program, provided that minimum corporate governance standards are met.
<i>Distribution</i>	Where public provision is working, or improvements in performance in a public utility are underway, the Bank can consider providing financial support. Where it is not, some form of public private partnership should be considered. Concession and OBA projects that can attract private investment should be considered, focusing on improvements in service quality and service expansion. If private investment still cannot be attracted, then management contracts or leases, accompanied by public investment in part financed by the Bank, can be considered at a minimum as an interim step.
<i>Regulation</i>	The path to strong, independent regulators with a track record acceptable to investors will often be a long one. Governments should provide for long-term capacity building but should fix, to the extent possible, provisions for prices and technical and customer service standards in the key regulatory instruments, such as licenses or contracts, for a medium-term period. Regulatory frameworks should be designed bearing in mind local capacities and institutional approaches.
<i>Next Steps</i>	Operational staff should use the framework provided in the note in conducting the dialogue with clients, and identifying and preparing new projects. This note will be supplemented with detailed technical notes that build on current knowledge resources.

## A. CONTEXT AND BACKGROUND

1. Infrastructure services are critical to economic growth, poverty reduction and the achievement of the Millennium Development Goals (MDGs). However, the investment volumes required to provide the capacity to deliver these services are enormous. IEA has estimated that to keep pace with growing demand, developing countries will have to invest annually around \$120bn in the power sector alone over the period 2001-2010.<sup>1</sup> During the 1990s, private capital flows made a substantial contribution to meeting these needs in some countries. But private flows have fallen substantially in recent years. From a peak of \$50bn in 1997, investment in power projects with private participation in developing countries fell to around \$7bn in 2002.<sup>2</sup> Difficulties in sustaining reforms to place the power sector on a commercial footing in some countries, a wider reduction in investment flows to emerging markets, and the withdrawal of investors have produced a more difficult climate for attracting private investment in developing country power sectors.<sup>3</sup>

### **BOX 1: Energy and Economic Development**

**Energy consumption shows a strong correlation with national income. Most economic activity would be impossible without modern energy including electricity, even the small and medium-scale enterprises that are the main source of new jobs for the poor (Energy Business Renewal Strategy, May 2001). The poor rank access to infrastructure as critical for moving out of poverty (Voices of the Poor, 2001). Modern energy also plays a key role in improving social service delivery, also critical to the achievement of the MDGs.**

2. In this context, the Committee on Development Effectiveness (CODE) requested that guidance be provided to staff on the appropriate roles of the public and private sectors in the provision of electricity services so that the funding required to meet these investment needs can be mobilized.

3. The request from CODE was made following the recent joint OED/OEG/OEU review of Bank Group activities to promote private sector development in the electric power sector.<sup>4</sup> This review recommended that the Bank continue to promote private participation in this sector where countries are committed to reforms. However, it highlighted the need for guidance to staff in the implementation of reform packages and their sequencing in the diverse country conditions in which the Bank Group is engaged. The report also raised concerns at the complexity, cost and time required for major reforms in the sector, as well as concerns about the outcomes of reform, including the need to integrate poverty and affordability concerns and environmental aspects into private sector development activities in the power sector.

4. The Bank's Infrastructure Action Plan sets out a series of measures to revitalize the Bank Group's infrastructure business.<sup>5</sup> The plan covers three key areas: responding to country demand by offering a broad menu of options for public and private sector infrastructure service provision; rebuilding infrastructure sector knowledge bases; and applying new and existing Bank Group instruments to effectively maximize the Bank's leverage. This guidance note forms part of the first set of actions, providing a broad menu of options for public and private infrastructure service provision. The plan also stresses that the Bank Group must remain focused on the delivery of infrastructure services rather than simply building new physical capacity.

5. Reform of the power sector will be needed to foster the financial viability of electricity service providers, and hence attract on a sustainable basis the public and private financing needed over time to expand services. The substantial investment needs of the power sector mean that increased investment from the private sector will be needed. Sector-specific measures to address this will be important. But actions to attract private investors in the power sector have to take into account the overall investment climate in a country.<sup>6</sup> These actions must also be realistic given the global and regional context, especially with regard to the current and future

<sup>1</sup> In "World Energy Investment Outlook, 2003 Insights", IEA estimates that about \$1200 billion of investment is required in the electricity sector of developing countries for the 2001-2010 period, for an average of \$120 billion per year.

<sup>2</sup> World Bank PPI Database.

<sup>3</sup> Harris "Private Participation in Infrastructure in Developing Countries", World Bank Working Paper Number 5, April 2003.

<sup>4</sup> "Private Sector Development in the Electric Power Sector: A Joint Review of the World Bank Group's assistance in the 1990s", OED/OEG/OEU, World Bank, July 2003.

<sup>5</sup> "Infrastructure Action Plan", presented at an informal Board Meeting, July 8, 2003.

<sup>6</sup> "Private Sector Development Strategy: Directions for the World Bank Group", April 2002.



levels of investor interest. Investment Climate Assessments and other diagnostic activities will be important for understanding the broader environment in which private participation in power will take place.<sup>7</sup>

6. This Note provides guidance to Bank Staff on assessing the suitability of available options for public-private roles in the financing and provision of electricity, and the main steps which staff should take to analyze these options. Given the variety and complexity of country circumstances, this note cannot provide answers or detailed recommendations to the individual situations that Bank staff will face. The note reviews the main choices in the scope and timing of reforms, such as public and private roles in the sector, unbundling and restructuring, focusing on how these reforms might be influenced by country conditions. The range of possible Bank Group interventions is summarized in the matrix attached to the back of this note.

## B. SECTOR REFORM OPTIONS

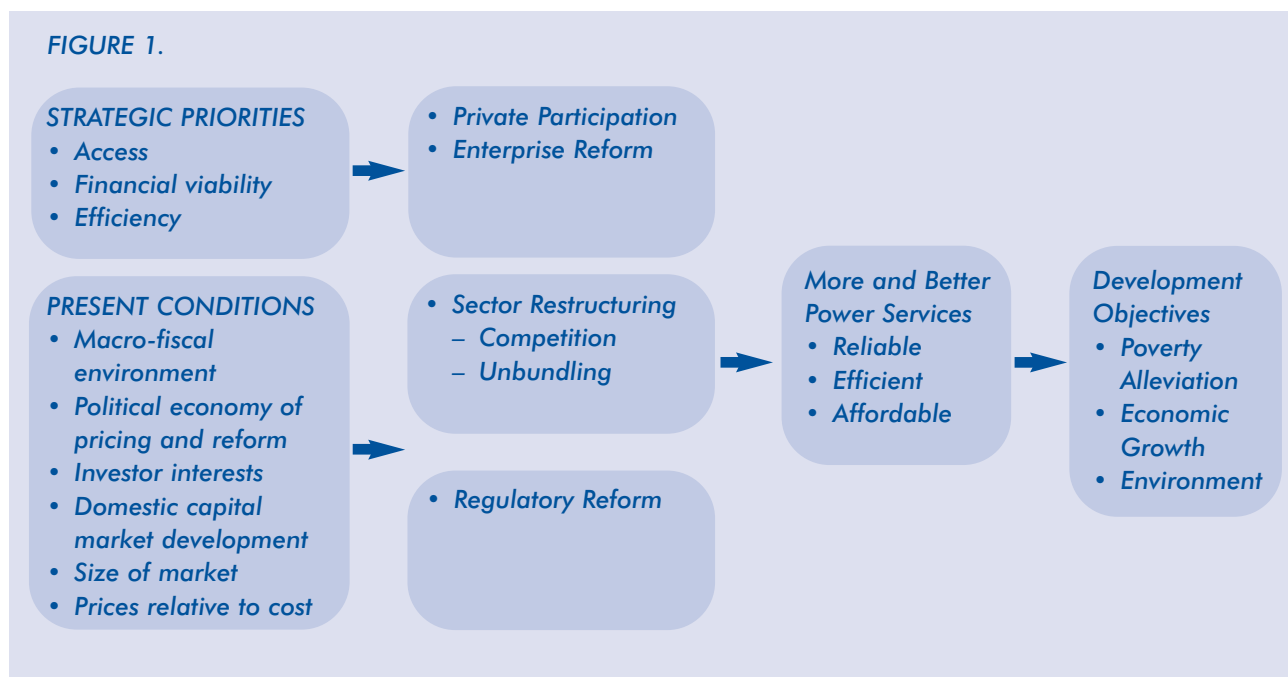
7. Power sector reform strategies should be designed to fit an overall framework for delivery of modern energy services to promote poverty alleviation and economic growth. Meeting these two objectives requires the

provision of reliable electric power services in sufficient quantity to meet affordable demand at the lowest cost reflecting the resources and impacts involved in their production and transportation.

8. Competition, unbundling, private participation, and other reform elements are not ends in themselves, but rather intended to contribute to the achievement of broad goals for poverty reduction, economic growth and environmental sustainability. In particular, these reforms should improve the economic efficiency of the sector and the commercial and operational performance of service providers.

9. Given the differing points at which they find themselves, countries have to fashion power sector reform strategies that reflect the strategic priorities for the sector, and the immediate country conditions that influence the suitability of particular approaches.

12. Governments face critical decisions in reforming their power sectors. They must decide the relative roles of public and private sectors in providing power services; the governance and reform of public enterprises operating in the sector; restructuring to introduce competition, including unbundling and the development of power markets; and regulatory reforms



<sup>7</sup> See also "Implementation Progress Report – Private Sector Development Strategy", presented to the Board June 2003 for information on the rollout of ICAs.

to improve oversight of the sector, introducing incentives for efficiency and encouraging service providers to be responsive to consumer needs. Access, equity, and environment must also be incorporated in the policy framework. Coherent reform strategies have to effectively link each area to produce a consistent package of measures. Reforms in the main areas proceed in most cases in parallel, but judgments about sequencing of measures have to be made in each case. “Cookbook” solutions for power sector reform clearly have to be avoided.<sup>8</sup>

13. Although strategies have to be adapted to country conditions, they must address fundamental issues. Electricity must be paid for either by consumers or by taxpayers. Revenue shortfalls are costly: they lead to deterioration in the quality of supply, assets and an inability to meet demand, as seen in many countries. Decisions about investment requirements, prices and the level of government support have to be mutually consistent to reflect this reality. Robust reform strategies, regardless of the choices made for the different roles of the public and private sectors, have to confront these issues, often in a situation where prices are well below full-cost recovery.<sup>9</sup> Without credible steps to improve suppliers’ commercial and operational performance, and to align revenues with costs, reform strategies are unlikely to succeed in improving sector performance and contributing to economic growth and poverty reduction.

14. Staff should assess the credibility and realism of proposed Government strategies while developing interventions. Important steps in such an assessment include a thorough understanding of the financial position of the entities operating in the sector, and a plan to improve efficiency and adjust prices to improve financial viability in a reasonable but credible time period. In countries that have had difficulties in implementing such reforms in the past, credible commitments to these reforms should be established through some actions to improve financial viability, including adjustments to prices and enforcement of payments by consumers, prior to substantial Bank financial support.

## **Public and Private Roles in the Provision of Electricity Services**

15. At the heart of most power sector reform efforts are a set of interrelated challenges: changing the manner in which new investments are financed, increasing the efficiency and development effectiveness of those investments, and increasing operational efficiency, while addressing equity concerns as the sector expands. It is now broadly recognized that pure public financing and provision have failed to adequately support economic and social development under the poor governance standards found in most of the Bank’s clients, and that they have imposed high opportunity costs on society. The private sector has shown that it can deliver efficient investments and improved services to customers of the power sector provided that the right business incentives are in place to attract investment – but that putting this framework in place can be challenging in many countries. Consequently, practical solutions for these countries may be public-private partnerships that lie between these options.

16. As outlined in the Bank’s Infrastructure Action Plan, it is important to consider the full range of options for public-private partnerships. These range from management contracts, which transfer only limited risks and responsibilities to the private sector, through concessions and asset sales. The likely benefits flowing from these approaches will be different (see Table 1). In formulating its approach to public-private partnerships, governments should assess what particular issues need to be addressed, and thereby the roles that need to be performed by the private sector. It should be remembered that the public sector can have a financing and/or a risk bearing role in all of these arrangements. For example, under concessions and divestitures, the government can provide financial support through targeted subsidies.

<sup>8</sup> See “Global Electric Power Reform, Privatization and Liberalization of the Electric Power Industry in Developing Countries” by Robert Bacon and John Besant-Jones. Energy and Mining Sector Board Discussion Paper No.2, The World Bank, June 2002.

<sup>9</sup> World Development Report 1994, “Infrastructure for Development”, The World Bank.

**Table 1. Main Forms of Public-Private Partnerships**

BENEFITS	MANAGEMENT CONTRACTS	LEASES	CONCESSIONS/BOTS	DIVESTITURE
Management expertise	Yes	Yes	Yes	Yes
Tariff discipline	No	Yes, but limited to operations and maintenance costs	Yes	Yes
Access to private capital	No	Yes, but limited to working capital	Yes	Yes

17. The possibilities for different levels of private participation, however, depend on political economy factors (including public acceptance, and pricing), the country and sector investment climate, and the legal framework that may in particular limit choices on the mode of private participation (for example, full asset sales may be precluded). All these approaches require competitive bidding for the operating rights, well designed contractual arrangements, and proper oversight.<sup>10</sup>

Where revenues are close to or cover costs, and the overall investment and regulatory climate is adequate, then private funding may be expected to contribute significantly to investment needs. Many countries have had difficulties, however, in moving to and sustaining cost-covering tariffs. In addition, many investors are now reluctant to commit investment capital. This raises questions over the viability of reforms that rely on finance and substantial risk-bearing from the private sector, particularly in countries that have seen reversals in reforms or have been unable to generate sufficient momentum to embark on the reform path. In these situations, the strategy for achieving the desired development objectives requires other approaches.

18. One response would be public-private partnerships that do not require private investment capital, such as management contracts and leases. There is some experience that well-structured management contracts can soon lead to some improvements in performance. However, designing these contracts remains difficult, and evidence also suggests that the effectiveness of these contracts diminishes over time after the initial

gains. While some management contractors have been able to improve performance to the point where the utility's cash flow is sufficient to attract some local commercial debt, in most cases access to commercial debt cannot be counted on.

19. Even in situations where revenues will be below the full cost of supply, including financing costs, it may be possible to attract deeper forms of private sector participation, such as concessions and asset sales, through well-designed subsidies. The design can be focused on specific interventions such as service expansion or covering a temporary shortfall in revenues over costs. There are a also number of approaches towards subsidy delivery, including output-based aid (OBA) approaches as well as more traditional input-based approaches, that should be examined in developing such approaches with client governments.<sup>11</sup>

20. Where subsidies are needed they must be well targeted and based on a clear policy rationale. Whether operators are public or private, a subsidy component being provided either through customers or directly to the company by government should have a secure financing source, for example through a dedicated fund. Escrow-type arrangements may be needed to help ensure timeliness of payments. A final issue relates to phasing out of subsidies. This often does not happen as planned, and staff should carefully assess the realism of the subsidy phase-out plan.

<sup>10</sup> See “Competitive Bidding for Long-Term Electricity Distribution Contract” by S. Littlechild for a discussion of contract design.

<sup>11</sup> See the Global Partnership on Output-Based Aid (GPOBA) website, [www.gpoba.org](http://www.gpoba.org), for more information on Output-Based Aid approaches and specific applications in the utilities sectors.

21. Even when prices fully reflect costs, additional measures to attract private investment may be required, for example because of uncertainties related to the legal and regulatory environment, or a lack of confidence that the government will maintain an agreed regulatory framework. These measures may require governments to share certain risks with the private operators until certain pre-conditions for viability are met, and to provide stronger commitments to agreed contractual and regulatory frameworks.

22. Responsibilities, risks and rewards need to be carefully allocated in public-private partnerships. Staff should ensure that the client develops a risk and reward allocation matrix for public-private partnerships, and assesses actual and contingent government liabilities so that the real costs and benefits of different private participation options are clear to the government and its development partners.<sup>12</sup> Where a government is faced with providing financial support, whether as a subsidy, a contribution to investment, or a guarantee, staff should help government assess the rationale, costs and delivery means of this subsidy as well as the risks involved to the government's overall budget situation. Such government support will likely be an integral part of many private participation transactions, particularly in lower income countries for the foreseeable future. Bank participation can provide both finance and assurance to investors.

23. The experience from the 1990s has helped to clarify the risks for governments in focusing primarily on attracting foreign operators and foreign investment. Staff should consider the capabilities of the local and regional private sector and financial markets during the process of discussing public-private strategies with governments. The possibility of using new Bank Group products to support local currency transactions should be investigated, as IFC has done recently for infrastructure projects in certain countries. Backstopping government commitments on risk-sharing and regulatory regimes with guarantees from third parties, can be used to help mitigate these risks as well.<sup>13</sup>

## **Enterprise Restructuring and Corporate Governance**

24. In the current environment, even very ambitious restructuring programs are likely to include a continuing ownership and operational role for the state. This seems to be particularly true in the transmission sub-sector, where a common strategy is to retain public ownership of transmission assets and continued public operation of the power system, even if private investors build and maintain new transmission lines. But it is also the case that certain other assets, for example, hydroelectric and nuclear power plants, might remain state-owned on public policy grounds. And many poorly performing distribution companies are expected to remain in the public sector for some time, usually because private investors will be deterred by the likelihood of unattractive returns.

25. As part of a comprehensive reform strategy, institutional strengthening of companies left in the public sector will usually be required to improve management and corporate governance. Where unbundling of a utility occurs, capacity building should focus on newly created, successor entities. Caution is advised in the number of new state-owned entities to be created when doing this. Extensive restructuring absent private participation has usually not worked very well.

26. Staff should assess the credibility of programs founded on improving corporate governance in weak state-owned entities, and in particular assess whether forecast improvements in efficiency and pricing regimes are likely to be realized and sustained. For entities that governments have programmed for privatization, experience has shown that resources for investment and organizational development pre-privatization should be relatively limited, and that efforts should be focused on immediate performance improvements and on facilitating privatization. Interim management contracts should be considered. For entities that remain in the public sector, the government should place a high priority on establishing satisfactory corporate oversight, for example, by putting an independent and qualified board in place with a clear mandate.

<sup>12</sup> Irwin "Public Money for Private Infrastructure", World Bank Working Paper No. 10, July 2003.

<sup>13</sup> See "Mitigating Regulatory Risk for Distribution Privatization – The World Bank Partial Risk Guarantee" by P. Gupta, R. Lamech, F. Mazhar and J. Wright, Energy and Mining Sector Board Paper No. 5, The World Bank, November 2002.

27. Staff should be especially attentive in assisting governments improve the financial viability of electricity service providers as reforms progress. This would include reforms to pricing levels and structures, enforcement of bill payment, including by government-owned entities, more targeted and efficient subsidy mechanisms, and improved corporate governance.<sup>14</sup> For example, an entity whose revenues do not cover its costs – including existing debt service – should not take on more debt. Financial models should be developed or appraised by Bank staff to broaden the understanding of sector financial health, assess projected fiscal and quasi-fiscal impacts of various reform options, and set targets for improving creditworthiness.

28. Competition and international trade and investment in power generation facilities are facilitated by a strong and well-regulated transmission network. Transmission investments should help reduce the cost of supply by better use of existing generation capacity and facilitating competition. The Bank can consider support to public sector transmission companies under a sound overall reform program. Investments should focus on service expansion, technical and commercial loss reduction, and facilitating trade through de-bottlenecking and congestion management.

29. Governments may seek to introduce new, local service providers into the rural electrification business to meet demand in areas currently not served by the incumbent(s). Bank staff should carefully assess the need for capacity building for these entities. They should also consider how best to deliver this support, and in particular whether it should be provided through existing facilities like SME development windows and NGO-supported micro-finance and business development entities. Staff should factor in the state of private sector and financial sector development when assessing the possibilities for SMEs or community-driven models in the power sector.

## Market Structure

30. The main issues for power market restructuring are the extent and pace of restructuring. The extent of restructuring concerns vertical and horizontal unbundling of the generation, transmission and distribution/supply segments of the market. This should be assessed on a case by case basis. Full unbundling is generally preferred in medium to large power markets to facilitate the introduction of competition at least in the market for wholesale trade in power. Even in some small power sectors, some level of vertical unbundling is likely to improve services and lower costs because it helps regulation of power service providers and even introduction of competitive pressures in the generation and supply markets.

31. For small markets with little or no opportunity for cross-border trading, regulation of a vertically integrated monopoly may be the most cost-effective choice until the power market has grown substantially. However, both market growth and regional power markets can be facilitated by the unbundling of even relatively small systems. Unbundling of accounts, staff and management should be the first step in this to increase the transparency of price setting and facilitate benchmarking of costs and service standards,<sup>15</sup> but full unbundling will be required to make these changes effective. These actions will also facilitate regulation by providing better information on costs.

32. The potential benefits of moving to more competitive trading arrangements are well known and, in addition to governance and regulatory motivations, usually underpin the extensive vertical and horizontal unbundling of monopolistic service providers. The difficulties in implementing competition in power markets are also by now well known.<sup>16</sup> There are several reasons for approaching full competition cautiously, but four factors are particularly apparent in developing countries:

- Many existing markets are too small to support the number of suppliers and purchasers needed for full competition in the market.

<sup>14</sup> See “Private Participation in the Power Sector in Europe and Central Asia: Lessons from the Past Decade”, by G. Stuggins and V. Krishnaswamy, World Bank Working Paper No. 8, 2003.

<sup>15</sup> Benchmarking can be a useful mechanism to help regulators review prices. However, a number of shortfalls in applying benchmarking are cited in papers by Graham Shuttleworth’s on [www.nera.com](http://www.nera.com). In particular, see “Regulatory Benchmarking: A way Forward or a Dead-end?”, October 1999.

<sup>16</sup> See Besant-Jones and Tenenbaum “California Power Crisis: Lessons for Developing Countries”, Energy and Mining Sector Board Discussion Paper No. 1, April 2001.

- Even in larger markets, for a number of reasons there are significant risks of market power abuse if suppliers are allowed to charge market-based prices.
- The sector may have a number of distributors that are not sufficiently creditworthy for trading on commercial terms.
- Policy makers have limited tolerance for the substantial price volatility that occurs with competition in the market

33. While not losing sight of the long-term potential of moving to fully competitive markets, staff should advise most of the Bank's clients to consider, for the near- to medium-term, limited competition for the market. Examples include allowing open access to networks by third parties besides the main generators and distributors, and trading on a bilateral basis between generators and distributors and other suppliers.

34. For a number of reasons, in reforming markets power capacity and energy tends to be traded under medium- and long-term contracts. Broadly speaking, this contract market comes in two models. In one of them only one entity (a "single buyer" that is often the state-owned transmission company) contracts to buy all or most of the power produced by generators and sell it to distributors and large power users. In the other, generators contract bilaterally with distributors and large users in a multi-buyer/multi-seller trading structure. The second model requires a mechanism to balance contracted flows of power with actual flows. While the most efficient balancing mechanism in theory is a liquid spot market, in practice many power markets are too small and institutionally undeveloped to provide the necessary liquidity. In those markets, staff should advise clients to consider more managed approaches to settling imbalances. Gradual market opening can be facilitated through measures that enable large users to enter into bilateral contracts with suppliers, gradually increasing this market by lowering the threshold power consumption level for eligibility to enter into these contracts as experience warrants. Where competitive markets are created, the government must ensure that market surveillance is set up so that the market operates as intended and that no entity or

group of entities abuses its market power. In addition, the transmission/system operator function should remain at arm's length from buyers and sellers in the power market to prevent capture of this monopolistic function by one or a group of market participants, and thus it often remains under public ownership.<sup>17</sup>

### Regulation

35. The development of capabilities and institutions to regulate power markets is an important part of sector reform. However, it is unrealistic to expect that a new regulatory system will be fully functioning and credible as soon after it is formally created. Experience shows that developing robust regulatory frameworks and strong institutions to manage them can be hampered by a variety of constraints, in particular under-funding and a reluctance by governments to transfer real independence in decision-making to regulatory authorities even when required to do so by law. Therefore, it is not surprising that private sector investors contend that a credible regulatory system requires more than a formally independent regulatory entity, especially in the critical early years right after it is created.

36. Since the reality is that many regulators will begin performing their functions with the disadvantage of limited independence and capacity, other transitional arrangements may need to be established to provide stability and predictability for a new regulatory regime. This could include limiting the amount of discretion that regulatory bodies have in setting prices and key parameters, particularly during the initial years of public private partnerships, particularly where the private sector is investing significant amounts of capital. This can be achieved by setting out details on key terms, such as initial price controls in the key regulatory instruments (licenses or contracts), or by having clear tariff setting principles in the country's legislation. In many situations, governments may have to play a major role in setting the initial terms and conditions of key regulatory instruments since these are best established as an outcome of the transaction process. Finally, since it will not be possible to anticipate all future events, there must also be robust and workable mechanisms for resolving disputes. Alternative (i.e. not going through local courts) dispute resolution mechanisms are often preferable, including international arbitration.<sup>18</sup>

<sup>17</sup> See "Transmission System Operators – Lessons From the Frontlines" by B. Tenenbaum, World Bank Energy and Mining Sector Board Discussion Paper No. 4, The World Bank, June 2002.

<sup>18</sup> See "Regulation by Contract – A New Way to Privatize Electricity Distribution?" by Bakovic, Tenenbaum and Woolf World Bank Energy and Mining Sector Board Discussion Paper No. 7, May 2003.

37. Bank staff should judge the appropriate models to be adopted and implemented in each case by considering ways in which the institutions, regulatory instruments, and regulatory skills can be developed and established over time in countries undertaking reform (see Table 2).

**Table 2. Designing Regulatory Frameworks**

INSTITUTIONS	INSTRUMENTS	SKILLS
<i>What attributes are necessary for regulators to perform their mission?</i>	<i>What comprises the legal framework within which the regulator works?</i>	<i>What are the tools that the regulator needs to manage within this framework?</i>
Independence	Legislation	Monitoring
Accountability	Contracts	Enforcement
Transparency	Licenses	Asset Valuation
Adequate funding	Arbitration and Alternative Dispute Resolution	Financial Analysis
Legitimacy		Benchmarking
Professional and technical expertise		Industry and company financial models

38. Building professional regulatory capability requires political commitment and adequate funding on the part of the government. If these prerequisites are in place, staff can help mobilize a wealth of resources and networks (like IFUR and the regional networks such as SAFIR and AFUR). In countries with little regulatory capacity, contracting out of many of the technical functions of regulation should be considered. Support from established regulatory agencies – perhaps linked through regional fora – will be important in transferring knowledge and best practice.

39. Economic regulation is based on the fundamental assumption that the regulated entity responds to economic incentives. However, this assumption is false in the case of many public sector firms. Publicly owned service providers generally do not respond to economic incentives, such as those which increase profits if efficiency targets are exceeded, unless they have been successfully commercialized. For naturally monopolistic segments, there remains the need for effective regulation regardless of ownership although there is no strong evidence in developing countries that independent regulation of

state-owned monopolies has successfully improved commercial performance. Nonetheless, such regulation can make better known the deficiencies in performance of the public utility, and improve transparency and accountability simply by reporting and benchmarking performance and thereby increase pressures for change.

### Access and affordability

40. Comprehensive reforms that place the sector on a sound financial footing will generate increased resources for investment in system expansion. However, improvements in access to electricity services do not automatically follow such reforms. The nature of the problem – lack of access to credit, high connection costs, affordability constraints – should first be diagnosed, and the findings should guide policies to address access and equity issues in the sector. In cases where most of the existing consumption subsidies are captured by the better-off (i.e., the connected, high consumption customers), staff should discuss and agree with clients measures to focus subsidies on lower income consumers.

41. Various regulatory and policy approaches have been tried to expand access and affordability.<sup>19</sup> They include the use of connection or coverage targets in concession and license agreements, obligation to offer service, liberalizing entry by other suppliers to unserved or under-served areas; allowing different levels of service for consumers; and the provision of subsidies for system expansion and consumption. Governments should also recognize that electricity may be appropriately provided by cooperatives or other community organizations operating mini-grids or reselling power purchased from the grid or by private entrepreneurs offering solar home or battery recharging systems.

42. In general, targeting subsidies at connections would be preferable to subsidizing consumption. Staff should assess, along with the government, the extent to which proposed subsidy schemes would benefit the poor and whether there is sufficient fiscal space for these subsidies. Schemes that ensure competition for subsidies on the part of the service provider should reduce the fiscal burden. Cross-subsidies from other consumers can also be employed, but staff should check that this approach would not unduly distort electricity prices or burden those consumers.

<sup>19</sup> See Estache et al “Accounting for Poverty in Infrastructure Reform”, WBI, 2003 for a discussion of access issues and experience in Latin America on this.

## Environmental considerations

43. The Bank Group should strive for effective environmental oversight of the power sector, regardless of the state of economic reform and the mix of public and private roles. Reform of the sector provides an opportunity for examining environmental regulation, and for assessing the relationship between the environmental and economic regulators. Measures should also be taken to ensure that reforms do not adversely affect the market for electricity generated from renewable energy sources. Environmental externalities should ideally be directly included in project economic analysis.

## C. STRATEGIES FOR EFFECTIVE BANK GROUP INTERVENTIONS

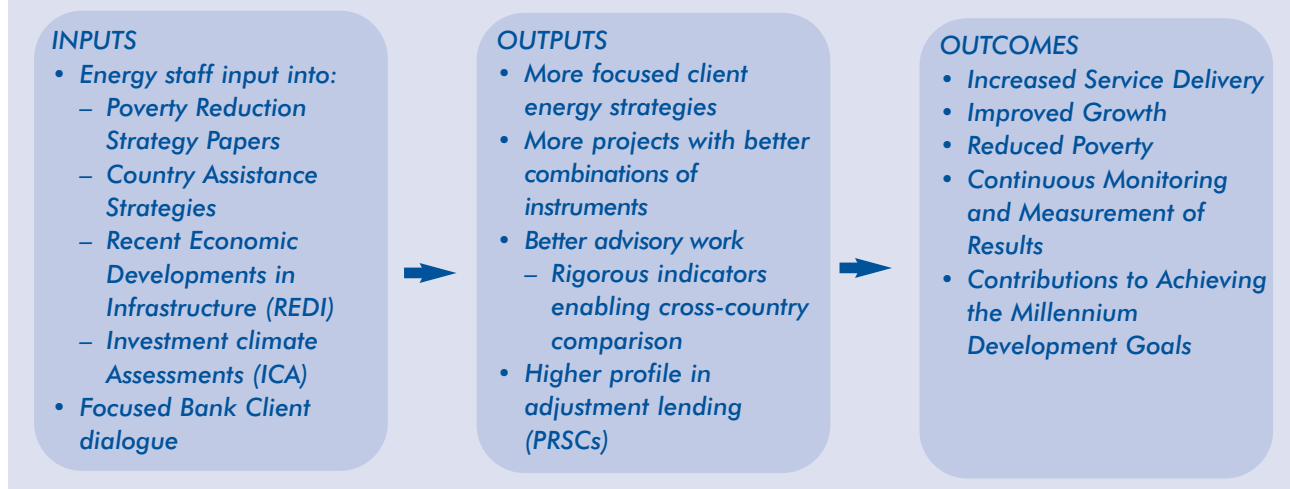
44. The Bank Group faces many challenges to achieve the objectives for its energy sector interventions, particularly as regards contributing towards the MDGs. These interventions occur in a dynamic, reform-oriented context in most situations. The range of instruments available to Bank staff is broad, ranging from technical assistance, adjustment loans/credits, standard investment approaches to utilizing new products, such as OBA and guarantees. More importantly, the potential for combining products promises both new opportunities but poses new and complex challenges. It should be recognized that significant effort will be required to get various institutions and their instruments working effectively together, an effort that should start as far upstream as possible – preferably at the level of the PRSP, CAS and Bank Group strategies for individual country power sectors where possible. The Results Chain shown below summarizes the recommended approach in a general way.

45. Energy staff should ensure that their activities are consistent with the country's poverty reduction strategy and within the County Assistance Strategy. Staff should also review investment climate issues in attracting private capital and the need for broader interventions to achieve required policy and institutional changes. Staff should engage clients in a dialogue about how the energy strategy fits into the broader poverty, economic, and environmental agenda.

46. While staff should consider carefully the electricity sector in terms of the dimensions of reform discussed above, Bank Group interventions often focus on one or more specific components of the electricity sector. In deciding the appropriate mix of instruments for these interventions, staff should be aware that where possible, Bank products that do not represent a claim on taxpayer resources should be preferred. Hence the selection of instruments depends on the issues to be addressed in the sector components covered by the Bank's interventions, and the public and private roles envisaged for these components (see the matrix attached to the back of this note).

47. In **Generation**, private financing, whether from local, regional or international investors, is preferred. Most governments can create a substantial role for private generators within their sector development strategies. Nonetheless, public support, in the form of IDA/IBRD guarantees and other forms of credit enhancement, will be a critical component of many private financings in the generation, along with IFC and MIGA products.

FIGURE 2. RESULTS CHAIN OF BANK GROUP ELECTRICITY INTERVENTION





48. Justifying public sector investment in generation on the grounds that it reduces financial costs to the sector is not adequate since this simply reflects the subsidies present in public financing. Staff should also critically assess proposals for public financing of generation that rest on the grounds of meeting affordability and equity concerns or addressing environmental externalities. Staff should instead consider approaches where subsidies are more directly targeted towards specific environmental or access goals, for example as subsidies in a competitive procurement for environmentally-friendly generation, or as targeted subsidies for electricity distribution services, such as new connections, or supply to disadvantaged households.

49. In some countries there may be concerns that private financing of thermal generation will not be forthcoming, even with substantial support from the Bank Group, and that these projects will therefore have to be financed and undertaken by the public sector. Before supporting such a strategy through IDA/IBRD financing, Bank staff should work with the government concerned to undertake a market test to assess whether there is indeed interest from the private sector. This market test would incorporate Bank Group instruments available to potential private financiers. The test could involve competitive tendering with Bank Group instruments (including IDA/IBRD guarantees, and IFC and MIGA products) built into the tender documents. Bank Group staff should agree with governments on streamlined procedures for ensuring that such a market test can be conducted efficiently by the prospective borrower.

50. There may be no private interest in these projects, despite the availability of Bank Group instruments. The lack of a credible reform program in which the sector generates insufficient revenues to cover costs and pay for incremental generation is of particular concern. Here, more public investment may increase the fiscal drain from the power sector and weaken pressure to improve sector finances. In these situations, staff should consider carefully whether any form of substantial intervention in the power sector would at this stage be beneficial. In such cases, interventions other than supporting public financing of generation may be preferable, for example support to reduce losses and revenue leakages through public-private partnerships in distribution.

51. Where staff judge that supporting lending to public thermal generation projects fits with the Bank’s strategy of assistance for the sector, then the following criteria should be met before such support is given:

- Generation projects under consideration are clearly consistent with a rigorous and up-to-date least-cost system expansion plan in the country or regional context
- The government has already taken steps to address the main operational and financial problems in the sector and has in place a credible plan for ensuring the sector remains on a sustainable financing footing
- There is fiscal space for these investments, and that they represent priority investments given scarce public resources; the impact of these investments on the public sector deficit, and possible impacts arising from the government failing to implement strategies for placing the sector on a sustainable financial footing should be evaluated.

52. New, large, and complex hydropower projects that have strong economic justification will usually require significant public investment. Compared to thermal generation, hydro projects have very different risk and benefit profiles and, accordingly, a much greater public financing role. These include the geological and hydrological risks, the long-lived nature of the assets, and the fact that many hydropower projects are multipurpose projects providing public goods such as flood control and drought protection. The Bank should support dams that are economically well justified, and should ensure that all such projects meet the good environmental and social practices which have been developed by the industry in recent decades. The context of the particular country (and in some cases, regional) situation should be carefully considered.

53. In **Distribution**, the focus should be firmly on service delivery. Financial viability of distribution is of the highest priority, as the interface with the customer determines the level of liquidity for all service providers in the sector. Experience in distribution privatization has met with problems in some countries, particularly where government have not lived up to their promises or where private investors misunderstood market risks. Staff should focus on ways in which public sector resources (encompassing equity, loans, output-based grants, and risk management products, including

guarantees for the maintenance of contractually-agreed regulatory frameworks) can best be packaged with sector reforms to leverage private sector investment and expand access. Possibilities for emerging regional and local companies to enter existing or greenfield electricity supply businesses should be considered. Management contracts or leases will not usually be suitable long-term solutions, need to be considered selectively. Bank and MIGA are well-placed to provide non-commercial risk guarantees on such management contracts to the extent that private financing is mobilized to implement the contracts. Good performing state-owned distribution companies can be considered for new lending. Where appropriate, Partial Credit Guarantees (in IBRD countries) should be considered to facilitate their access to commercial debt markets.

54. **Transmission** should be seen as an important avenue for public sector investment lending by the Bank as transmission systems form the backbone for market operation and facilitate trade. Lending for transmission can take place where this function is the responsibility of a capable public sector entity, or for combined operations where new lines are developed on a turnkey basis with private and public participation. Staff should seek opportunities to assist governments with new investments and with establishment and institutional strengthening of new or restructured transmission companies. Bank support for public and public/private transmission investments needs to take into account client commitment to overall reforms, including the attraction of private capital in generation and distribution. Successful experience with BOOT-type transactions, particularly in Latin America, shows that private capital can be beneficially invested the transmission sector, and PSP possibilities in transmission should be presented to clients.

55. For **Rural Electrification** and **Renewable Energy**, staff should consider possibilities for mobilizing grant resources for clients because of affordability problems. Cooperatives and dedicated rural electrification agencies, that have a clear mandate, have shown promise in some countries. For electrification programs, OBA would be well suited for IDA grant financing, especially as IDA's grant window evolves. Staff are also encouraged to consider mini-grid, off-grid and grid extension options in rural areas. Small power generation requires careful consideration, taking into account pricing distortions, as they can decrease supply costs and improve grid stability. For renewable energy, staff should ensure familiarity with funding possibilities under PCF, CDF, CDM, and GEF.

56. **Regional integration** projects can bring substantial benefits in terms of reducing generation costs, increasing reliability and introducing competition. However, staff should also address the viability of these projects absent reforms in the markets being integrated. While many partially reformed markets would in practice be able to benefit from greater regional integration, in some areas trade in general, much less realizing the full benefits of trading possibilities, will not be possible without financially stronger entities.

## Matrix of Bank Group Electricity Sector Interventions

SUB-SECTOR	KEY ISSUES	PRIVATE SECTOR INTEREST	GOVERNMENT APPROACH	BANK GROUP INSTRUMENTS
Generation	<ul style="list-style-type: none"> <li>Rehabilitation</li> <li>New capacity</li> <li>Sector finances</li> <li>Who buys new capacity and energy, and how?</li> <li>How to finance required capacity needs?</li> <li>What trading opportunities are there for new generation entrants?</li> </ul>	<p>HIGH but. . . .</p> <p>Policy and regulatory environment has to be right</p> <p>PSP desirable but not at any cost: esp. important to limit contingent liability exposure vs. direct liability through public power development</p> <p>Investment Climate must be amenable to PSP in energy</p>	<p>HIGHLY RECEPTIVE</p> <p>Most governments assuming substantial private sector investment in generation</p> <p>Public support to cover policy/regulatory risks necessary in many of developing countries</p> <p>Public investment role might be necessary</p>	<p>IFC</p> <p>MIGA<sup>20</sup></p> <p>IDA/IBRD Guarantees to attract project debt</p>
Transmission and System Operations	<ul style="list-style-type: none"> <li>Rehabilitation and Strengthening</li> <li>Expansion</li> <li>Regional Interconnections</li> <li>PSP in new lines ?</li> <li>Single Buyer role ?</li> <li>Third-Party Access (TPA)</li> </ul>	<p>MODERATE</p> <p>With right structure, there might be significant interest in management contracts for transmission asset management and system operations</p> <p>There are opportunities for private investment in new lines, but deal flow is relatively slow and there are only a few significant private players</p> <p>There have been successful BOOTs especially in Latin America</p>	<p>MODERATELY RECEPTIVE</p> <p>Most Governments assume continued state ownership (if not monopoly) and operational role but many are open to private investment in new lines</p> <p>Transmission business may be complicated by Single Buyer responsibilities</p>	<p>IFC</p> <p>MIGA</p> <p>IDA/IBRD</p> <ul style="list-style-type: none"> <li>SILs/IBRD PCG for public sector investment</li> <li>Guarantees for BOTs and BOOTs</li> <li>Financing of management contracts?</li> </ul>

<sup>20</sup> MIGA products – inconvertibility and transfer risk, expropriation, breach of contract, war: cover on project equity, management contracts, turnkey contracts and debt.

## Matrix of Bank Group Electricity Sector Interventions

SUB-SECTOR	KEY ISSUES	PRIVATE SECTOR INTEREST	GOVERNMENT APPROACH	BANK GROUP INSTRUMENTS
Distribution and Access	<ul style="list-style-type: none"> <li>Rehabilitation and Strengthening</li> <li>Expansion esp. for new connections</li> <li>Cost-covering tariffs</li> <li>Cost minimization</li> <li>Sustainable subsidies</li> <li>Stable tariff evolution</li> </ul>	<p>LOW</p> <p>Key challenge is how to package Government reform initiatives and Bank Group products to increase private sector interest</p> <p>Emerging local and regional players can play an important role as operators or minority partners – but often lack adequate financing capacity, how to do due diligence on them?</p>	<p>MODERATELY RECEPTIVE</p> <p>Many Governments recognize that PSP is highly desirable but many also are reluctant to push pricing reform too fast</p> <p>Important to deal up-front with social, labor issues</p>	<p>IFC</p> <p>MIGA</p> <p>OBA support to distribution PSP schemes should be prioritized</p> <p>Management contracts and leases might need to be considered for at least an interim period</p> <p>IDA/IBRD – OBA; guarantee products covering maintenance of agreed regulatory frameworks</p> <p>GuarantCo (for covering risks at sub-sovereign level)</p>
Regulatory and Market Framework	<ul style="list-style-type: none"> <li>Electricity market design</li> <li>Building professionalism in regulation – institutional options ?</li> <li>Regulatory discretion – independence? regulation by contract?</li> <li>Pricing approaches</li> <li>How much competition and when?</li> </ul>	<p>Fair, predictable, and transparent regulatory framework is eventually critical for attraction of PSP</p> <p>Sector financial restructuring, level-playing field with public utilities tariff path, and subsidy approach need to be fully integrated</p> <p>The existence of adequate transmission network and credible off-takers with whom to contract capacity are essential for new green-field investors.</p>	<p>Some reluctance regarding regulatory independence</p> <p>Political economy of pricing puts regulatory agencies in difficult position</p>	<p>IDA/IBRD TA Matrix condition for adjustment lending?</p> <p>Trust Funds</p> <p>Bank staff to bring in bilateral donors (e.g. USAID)</p> <p>Global and regional networks of regulators (IFUR, SAFIR, AFUR)</p>

## Matrix of Bank Group Electricity Sector Interventions

SUB-SECTOR	KEY ISSUES	PRIVATE SECTOR INTEREST	GOVERNMENT APPROACH	BANK GROUP INSTRUMENTS
Rural Electrification and Access	<ul style="list-style-type: none"> <li>New connections</li> <li>Sustainable subsidy approaches – OBA ?</li> <li>New operators inc. SMEs, CDD, IMC</li> <li>Social connections – health clinics, schools, village lighting</li> <li>“Rural livelihoods” approaches are difficult in practice</li> </ul>	<p>MODERATE to LOW</p> <p>Focus is likely to be on smaller national and regional players</p> <p>Potential for SMEs/CDD entities to enter an RE market needs to be carefully considered</p>	<p>MODERATELY to HIGHLY RECEPTIVE</p> <p>Many governments recognize the limited potential of pure public approaches to the access problem</p>	<p>IFC (incl. Municipal Fund)</p> <p>MIGA</p> <p>IDA Grants for OBA</p> <p>IDA/IBRD loan/guarantee support for OBA</p> <p>GEF/PCF</p> <p>GuarantCo</p> <p>Business development from SME facilities</p>
Renewable Energy	<ul style="list-style-type: none"> <li>Carbon mitigation</li> <li>Transition from traditional energy</li> <li>Energy diversity and security</li> <li>Multi-purpose, resource management benefits of hydropower with dams</li> </ul>	<p>MODERATE to HIGH</p> <p>Subsidy will almost always be necessary to attract private sector</p> <p>Do projects require off-take from grid?</p>	<p>HIGHLY RECEPTIVE</p> <p>Governments are amenable to PSP in Renewable Energy projects – grant helps</p>	<p>GEF</p> <p>PCF</p> <p>AFRREI, ASTAE</p> <p>Bank/IFC/MIGA guarantees</p>
Environment	<ul style="list-style-type: none"> <li>Pollution abatement</li> <li>Environmental mitigation</li> <li>Carbon emission reduction/avoidance</li> <li>Technology/fuel migration – from dirty to clean</li> </ul>	<p>MODERATE to HIGH</p> <p>Many firms thinking “green”</p> <p>Environment emerging as core competence and competitive advantage for some energy firms</p> <p>Subsidy may be applicable in some scenarios</p>	<p>MODERATELY RECEPTIVE</p> <p>Coordination between energy and environment ministries could be an issue</p> <p>How to navigate “develop now, clean up later” mentality?</p>	<p>GEF</p> <p>PCF</p> <p>IFC</p> <p>IDA/IBRD</p>

## Matrix of Bank Group Electricity Sector Interventions

SUB-SECTOR	KEY ISSUES	PRIVATE SECTOR INTEREST	GOVERNMENT APPROACH	BANK GROUP INSTRUMENTS
Support to PSP Transactions	<ul style="list-style-type: none"> <li>Deal flow</li> <li>Deal quality</li> <li>Leveraging public sector resources – OBA? Direct support to firms?</li> <li>Coordination with public sector investments – e.g. transmission investments</li> <li>Flexibility in lending program to accommodate emerging PSP opportunities</li> </ul>	<p>Transparent, competitive bid processes seen as desirable by private sector</p> <p>Experience shows that bilaterally negotiated deals have often taken more time to put together, have higher transaction costs, and may result in less stable contract structures</p>	<p>Despite PSP slowdown, most governments have increased PSP in distribution and generation at the heart of their reform plans</p> <p>Transparent PSP transaction processes essential for legitimacy</p> <p>Avoiding tariff shock is key political economy concern</p>	<p>IDA/IBRD TA</p> <p>IFC Advisory Mandate</p> <p>DevCo</p> <p>Bank guarantees covering breach of contract; can be offered at the time of bidding to enhance competition</p> <p>MIGA Breach of Contract cover both for sovereign and sub-sovereign obligations is especially interesting.</p>
Regional Integration	<ul style="list-style-type: none"> <li>Physical interconnections</li> <li>Market integration (SAPP, EU)</li> <li>How important is country-level sector reform?</li> </ul>	<p>LOW to MODERATE</p> <p>Some form of cross-border guarantee likely to be essential</p> <p>Highly dependent on country-level sector financial health</p>	<p>MODERATELY RECEPTIVE</p> <p>Most governments and parastatals like the idea of interconnection, but absence of functioning internal and/or regional markets makes it difficult</p>	<p>Bank Group should be highly selective</p> <p>Projects are unlikely to produce expected benefits unless country-level reform is successful</p> <p>Loans and guarantees</p>





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