

# Centralized Purchasing Arrangements: International Practices and Lessons Learned on Variations to the Single Buyer Model

**Beatriz Arizu, Defne Gencer and Luiz Maurer**



THE WORLD BANK  
GROUP



The Energy and  
Mining Sector Board

## **AUTHORS**

*Beatriz Arizu (barizu@mercadosenergeticos.com) is an executive with Mercados Energéticos, a consulting firm based in Argentina. In this capacity, Mrs. Arizu has been involved in the restructuring of power sectors in about 20 countries. Before joining Mercados, she worked for the Energy Secretary in Argentina.*

*Luiz Maurer (lmaurer@worldbank.org) is a Senior Energy Specialist at the World Bank. Before joining the Bank, he worked as an executive and as a consultant in the oil and gas and utility industries in Latin America and in the United States.*

*Defne Gencer (dgencer@worldbank.org) is a Power Sector Reform Consultant in the Energy and Water Department at the World Bank. Before joining the Bank, she worked for the Energy Market Regulatory Authority of Turkey as a specialist on power sector regulation.*

## **DISCLAIMERS**

*The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors and should not be attributed in any manner to the World Bank, to its affiliated organizations, or to members of its Board of Executive Directors or the countries they represent.*

## **CONTACT INFORMATION**

*To order additional copies of this discussion paper please contact the Energy Help Desk: +1.202.473.0652  
energyhelpdesk@worldbank.org*

*This paper is available online [www.worldbank.org/energy/](http://www.worldbank.org/energy/)*

---

*The material in this work is copyrighted. No part of this work may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or inclusion in any information storage and retrieval system, without the prior written permission of the World Bank. The World Bank encourages dissemination of its work and will normally grant permission promptly. For permission to photocopy or reprint, please send a request with complete information to the Copyright Clearance Center, Inc, 222 Rosewood Drive, Danvers, MA 01923, USA, fax 978-750-4470. All other queries on rights and licenses, including subsidiary rights, should be addressed to the Office of the Publisher, World Bank, 1818 H Street N.W., Washington DC, 20433, fax 202-522-2422, e-mail: [pubrights@worldbank.org](mailto:pubrights@worldbank.org)*

# Centralized Purchasing Arrangements: International Practices and Lessons Learned on Variations to the Single Buyer Model

**Beatriz Arizu, Defne Gencer and Luiz Maurer**

**The World Bank, Washington, DC**



THE WORLD BANK  
GROUP



The Energy and  
Mining Sector Board



## CONTENTS

<b>ABBREVIATIONS AND ACRONYMS</b> .....	ii
<b>FOREWORD</b> .....	1
<b>EXECUTIVE SUMMARY</b> .....	3
<b>1. INTRODUCTION</b> .....	4
<b>2. FORMS OF THE PURE SINGLE BUYER MODEL</b> .....	5
<b>3. ADVANTAGES AND DISADVANTAGES OF THE PURE SINGLE BUYER MODEL</b> .....	7
<b>4. EXPANDING THE CONCEPT OF THE SINGLE BUYER</b> .....	16
<b>5. MITIGATING SOME PROBLEMS OF THE SINGLE BUYER WHILE PRESERVING ADVANTAGES</b> .....	21
<b>6. CONCLUSIONS AND RECOMMENDATIONS</b> .....	36

## ACKNOWLEDGEMENTS

This paper could not have been written without the assistance of many friends and colleagues inside and outside the World Bank. These individuals helped us develop an understanding of the wholesale market design and implementation issues in developing and developed countries. They generously shared their time and insights to make sure that we understood the issues at hand and their implications for the countries we focused on. They include Ali Saleh Al-Barrak, Tariq Al-Betairi, Suman Babbar, Philippe Benoit, Ashley Brown, William Dunn Jr., Jonathan Halpern, Dilma Rousseff, Bernard Tenenbaum, Mauricio Tolmasquim, Fareed M. Zedan, and Fiona Woolf. Of course, none of them should be held responsible for any errors of fact or interpretation that remain.

We would like to give special recognition to James Barker, Laszlo Lovei, and Tjaarda Storm van Leeuwen, our diligent peer reviewers. We would like to particularly commend Laszlo for pioneering the discussion of this important and controversial topic at the World Bank and inspiring us to further investigate its implications.

Finally, we wish to acknowledge the financial assistance of the World Bank's Energy and Water Department (EWDEN) in preparing this report. We owe a special debt of gratitude to the department's director, Jamal Saghir, who provided resources and encouraged us to pursue this topic.

## ABBREVIATIONS AND ACRONYMS

AES	AES Corporation, USA
BLCP	BLCP Power Limited
CCEE	Chamber of Electric Energy Commercialization, Brazil
CDEEE	Dominican Corporation of State Electricity Companies
CFE	Federal Electricity Commission, Mexico
DWR	California Department of Water Resources
EDF	Electricité de France S.A., France
EGAT	Electricity Generating Authority of Thailand
ESKOM	Electricity Supply Commission, South Africa
EVN	Electricity of VietNam
IDA	International Development Association
IPP	Independent Power Producer
IPTL	Independent Power Tanzania Ltd
MW	Megawatt
MWh	Megawatthour
PPA	Power Purchase Agreement
PRG	Partial Risk Guarantee
PURPA	Public Utility Regulatory Policies Act
ROE	Return on Equity
SPP	Small Power Producers
TANESCO	Tanganyika Electric Supply Company Limited
TEAS	Turkish Electricity Corporation
TEIAS	Turkish Electricity Transmission Company
TETAS	Turkish Electricity Trading and Contracting Company
TSO	Transmission System Operator
WPPI	Wisconsin Public Power Inc.
US\$	U.S. Dollars

## FOREWORD

The World Bank has been approached by some developing countries asking for advice on how to expand their generation sector when a comprehensive restructuring of their power sectors is not technically feasible or politically desirable. Under those circumstances a question frequently asked is whether or not the Single Buyer is the only remaining alternative to attract private capital. And how should it be implemented? In this dialogue, the Bank's client countries have expected some rather pragmatic advice on how the Single Buyer model should be implemented to maximize its benefits and avoid its drawbacks.

In order to review worldwide experience with Single Buyers and other Centralized Purchasing Arrangements, the Bank selected several case studies, with a heavy emphasis on developing countries. Different models have been scrutinized, in search for relevant lessons or directions to the developing world.

This paper is an attempt to approach this concept with a fresh perspective and examine how it was implemented, what objectives it served, how it changed over time, and what arrangements have been introduced to overcome its drawbacks, while preserving its positive attributes.

The paper provides some lessons and recommendations that may be useful both for countries which are contemplating to restructure their power sectors and for those at more advanced stages of power sector reform.

### ***Jamal Saghir***

Director, Energy and Water

Chairman, Energy and Mining Sector Board



## EXECUTIVE SUMMARY

The expression “Single Buyer” has been dubbed by the power industry to designate a commercial arrangement whereby one entity, usually government owned, has the monopoly over wholesale electricity trading in a region. The Single Buyer, in its purest form, is also the sole seller of wholesale energy to all end consumers, either directly or via a distribution company. In this capacity, a Single Buyer may be an electric utility or an entity created specially to assume the energy trading role.

The Single Buyer model was introduced as an initial step in power sector reform. It started in the United States as part of the PURPA approach, with the objective of increasing competitive pressure on integrated utilities and promoting cogeneration. Later on, a similar model was adopted in the developing world, this time with the objective of attracting new investments in generation from the private sector, mainly in countries facing serious energy shortages. By introducing the Single Buyer model, many developing countries were able to achieve remarkable results in terms of attracting much needed new capital into distressed power sectors, particularly in Asia. Thousands of MW were contracted and commissioned. Undoubtedly, in those cases the model helped relieve power shortages and in this respect support economic growth.

Despite the initial optimism, the model was not flawless. Experiences in many parts of the world have shown that the Single Buyer fell short of expectations. It created a series of unanticipated problems such as excess capacity, high tariffs and stranded costs. It also lacked transparency and accountability, and in some cases exacerbated corruption problems. Because of the rigidity of the contractual arrangements put in place, the Single Buyer impeded the development of competition and the evolution of power sector reform.

Nevertheless, the Single Buyer model continues to be considered as a valid wholesale energy trading arrangement and is being adopted in some countries, most of which do not foresee any other workable

alternative means of expanding their generation capacity. Reasons are many. Firstly, several of those countries are financially constrained, plagued by inefficient, non-creditworthy state owned utilities. Secondly, smaller countries remain unconvinced that a competitive wholesale market is a workable proposition that can be introduced in the short run.<sup>1</sup> Thirdly, some large countries, not necessarily financially constrained, prefer a Single Buyer to maintain the government’s control over the development the power sector. In part, this concern is a somewhat disproportionate reaction to the problems brought about by the California crisis.<sup>2</sup>

The issue then becomes what those countries should do to balance the need to expand their power sectors with the necessity to avoid implementing institutional arrangements that they may later regret. To help countries address these challenges, the Bank has carried out an empirical analysis of the implementation of the Single Buyer model and other variations of centralized purchasing arrangements in the last 15 years, in around world. This paper is an attempt to shed new light into the controversial, oftentimes polarized discussion of the Single Buyer model by extracting some lessons learned and best practices around the world.

An interesting finding of the study is that there are several ways to implement what is broadly referred to as a “Single Buyer” model. In some of the cases reviewed, the relevant entity assigned as Single Buyer was not “single” and in other cases it was not a “buyer” at all. One observed common feature in most of the case studies is the existence of one central entity aggregating the load, playing some role in the procuring of energy to serve that load, and allocating this energy among different consumers or distribution companies. Given those characteristics, we chose the expression “centralized purchasing arrangement”, to more properly capture the multitude of commercial arrangements that can be in place.<sup>3</sup> The pure Single Buyer model is one among many forms of centralized purchasing arrangements.

<sup>1</sup> Not only distressed and small power systems are considering the implementation of Single Buyers. The Province of Ontario, in Canada, has just implemented a similar arrangement, the rationale being the pressing need of promoting a significant expansion in the power system, since many of its existing plants will be decommissioned in the short term.

<sup>2</sup> For a detailed discussion on the California crisis, please refer to *The California Electricity Crisis*. Sweeney, James L, Hoover Institution Press, Stanford, California, 2002 and to *The California Power Crisis: Lessons for Developing Countries* (200k pdf). World Bank Energy and Mining Discussion Paper No. 1, John Besant-Jones and Bernard Tenenbaum, Washington D.C. April 2001.

<sup>3</sup> In the absence of a more accurate denomination, a centralized purchasing arrangement is intended to refer to a commercial process where an agent is responsible for some form of coordination among the multiple tasks involved in wholesale energy procurement

By examining the broad range of variations in design and implementation of energy trading models around the world, our evaluation showed that sometimes the pure Single Buyer is actually the only alternative, particularly in distressed power systems. Even under dire circumstances, it is still possible to minimize many of its drawbacks with a careful design at the outset. It is essential to procure energy competitively and build flexible contractual and institutional arrangements that envisage a smooth transition towards a more competitive power sector, when conditions permit.

The results of this study also indicate that it is neither necessary nor desirable to grant a *de jure* monopoly status to a Single Buyer, even at the early stages of power sector reform. Such a monopoly may backfire, by creating future rigidities that will defeat the main objectives of the reform process. Experiences have shown that more often than not, Single Buyer models have resulted in unaffordable prices, lack of transparency, and virtually little or no competition in power generation.

## 1. INTRODUCTION

The analysis builds upon previous studies carried out for Tunisia, Saudi Arabia, and Brazil, as well as on the hands-on experience developed by the World Bank in countries which faced similar challenges of mobilizing the necessary investment in their power sectors. This paper also examines how the Single Buyer concept or variations thereof, were initially implemented and have recently evolved in countries like Cambodia, Honduras, Hungary, Italy, Jordan, Mexico, Northern Ireland, Panama, Thailand, Turkey, Ukraine, the United States and Vietnam. The countries were selected after a screening and clustering process, with a view to ensuring that the cases offered a good geographical coverage.

A “pure” Single Buyer may be defined as a structural and commercial arrangement where one entity, usually a government owned agency or company, has the monopoly over wholesale energy procurement and resale. We identify two major types of the “pure” Single Buyer: the *integrated* and the *unbundled* one, which are differentiated based on the degree of vertical integration or the extent of unbundling in the sector.

Single Buyer models are centralized purchasing arrangements, built on the idea of one entity aggregating the load, playing a major role in the procurement of energy to serve that load, and in allocating this energy directly to large or small consumers either via “marketers/retailers” or via distribution companies. However, in many of the cases analyzed – which were still referred to as Single Buyers - the relevant entity was not single, nor it was involved in any buying or selling of energy. In this sense, they were not “pure” single buyers.

In light of the multiple variations in the application of the concept, we tried to define a broader concept of “Centralized Purchasing Arrangements.” We use this term to embody commercial and organizational structures that have somewhat misleadingly been referred to as “Single Buyers”. The comments and criticisms to the “Single Buyer” model, discussed in this paper, refer to this arrangement in its purest form.

Using the selected case studies, this paper examines how the pure Single Buyer model, as well as other centralized purchasing arrangements, have worked around the world. For each case, we discuss the positive and negative aspects of the existing arrangements, as well as any proposed changes to deal with specific shortcomings. We then extract general lessons that may be useful both for countries which are contemplating to restructure their power sector and for those at more advanced stages in the reform effort.

## **2. FORMS OF THE PURE SINGLE BUYER MODEL**

The “pure” Single Buyer may be organized in two different ways: vertically integrated or functionally unbundled. Each one of those organizational alternatives will be discussed in detail below.

### ***The Integrated Single Buyer***

The introduction of an Integrated Single Buyer model in the developing world occurred in the late 1980s and early 1990s, and was one of the first steps towards opening the power sectors to competition in developing countries. Some examples of this model include Tanzania, Nigeria, Cambodia, Mexico, and Thailand.

According to this approach, a vertically integrated utility plays the role of buyer in the wholesale market. The utility may own generation assets, but not sufficient to meet its entire load. Therefore, the utility acquires energy from Independent Power Producers (IPPs) via long-term contracts. By choosing this arrangement, countries have been able to maintain their power sector structures relatively intact; thereby averting strong backlash, which would have emerged in the case of more fundamental reform efforts. This arrangement spurred private sector generation investments in financially constrained power systems. Countries embarking upon this kind of arrangement were in most cases seeking rapid relief from acute supply shortages, or expected future shortages if no new investment came in place.

It was also expected that this model would be able to create some form of competition “for” the market, as multiple bidders should in theory compete to build new generation and sell energy to the integrated utility. The electricity trading arrangements were usually characterized by long-term power purchase agreements (PPAs). Those were typically 15- year or more power contracts, in many cases denominated in US dollars to hedge the producer against currency exchange risks. Some countries took advantage of the possibility to create competition “for” the market through competitive procurement (e.g. Thailand, Mexico), while others accepted unsolicited offers and entered into negotiated deals.

This model was extensively used in countries at early stages of power sector reform. In Asia, for example, Pakistan and Thailand had their state-owned integrated power company purchasing energy from IPPs to supply their own distribution divisions. The same model has been applied in Mexico, due to the political difficulties of reforming the sector and in unbundling CFE, the state owned utility. In those countries, some form of competition was introduced “for the market,” on an incremental basis. Tanzania, Indonesia, Malaysia, the Philippines, Dominican Republic, Nigeria, Cambodia, India, and many other countries decided to embrace this integrated model.

Many of those countries had no alternative but to adopt an integrated Single Buyer at the outset. Only the existing state owned companies with sovereign guarantees were sufficiently creditworthy to attract lenders and power project developers. Attempts to have distribution companies (or affiliated divisions) buying directly from greenfield power plants would not have succeeded, given the lack of creditworthiness of those utilities as off-takers.

When a utility is not creditworthy due to its poor financial performance, subsidized tariffs, low collections or high technical and non-technical losses, PPAs tend to require sovereign guarantees. Therefore, in such case the success of attracting private investors is heavily dependent on Government acting as a guarantor, which should only be considered as a transitory measure. At the outset of the IPP programs, these guarantees helped to increase the comfort level of private investors and of the investment bank community. The possibility of shifting risk away from developers was received with great enthusiasm. For some, it seemed that the Single Buyer would be able to solve the problems of the power sector without the country being forced to confront the thorny issues of cost reflective tariffs, reduction of non-technical losses and non-payment by consumers. However, this created a burden on the Government since the critical problems – average tariffs that do not recover costs or inefficient losses – were not addressed and resolved.

The integrated Single Buyer model was usually successful in enabling new generation capacity, though in many cases this apparent success was due to the Government

involvement in providing sovereign guarantees. Such kinds of arrangements created contingent liabilities and are not convenient in the long term.

### **The Unbundled Single Buyer**

The main feature of this model is that the generation business is separated from the “wires” and from the retail businesses. This separation may be implemented as functional and accounting unbundling (ring fencing), or by the creation of independent companies (or subsidiaries of a holding company). Purchasing functions may be carried out by the generation company or by an independent entity.

A typical institutional arrangement has been to combine transmission assets and power system operation functions with wholesale trading activities. The transmission service provider, which is also the system operator,<sup>4</sup> plays the role of the monopoly wholesale purchaser. This approach was followed initially in Northern Ireland, in the early stages of the power reform process.

A benefit of this approach is that the Unbundled Single Buyer does not own generation assets and should in theory dispatch and provide network access to all available generation on a non-discriminatory basis.<sup>5</sup> Therefore, this arrangement should increase the level of comfort among new players interested in making new investments in generation. It also potentially paves the way for an embryonic competitive energy market, where all generation companies are on a level playing field as far as dispatch and access are concerned.

Since the first Unbundled Single Buyer was introduced, it has been implemented in several jurisdictions, under different market structures. It has been adopted, for example, in countries at the early stages of power sector reform, which needed to attract private financing for new generation or rehabilitation of existing power plants. It also has been proposed as a transitional arrangement in power sector reform as an attempt to gradually foster competition and at the same time attract private investment.

<sup>4</sup> By system operator we mean the dispatch function, control centers and associated activities to coordinate generation and maintain a reliable and balanced transmission system and load supply.

<sup>5</sup> One possible way to prevent discrimination is to oblige the integrated utility to procure energy from third party producers and pay the equivalent to the buyer's avoided cost, as determined by the relevant State regulatory commission. This was the case in the US as a result of the PURPA legislation.

### 3. ADVANTAGES AND DISADVANTAGES OF SINGLE BUYER MODEL

This section discusses the advantages and disadvantages of the “pure” Single Buyer model.<sup>6</sup> It relies upon empirical evidence and lessons extracted from the case studies that form the basis of this document.

#### Advantages of the Single Buyer Model

The main observed advantages of the Single Buyer model are shown in Box 1. Each one of those advantages will be discussed below.

##### Box 1: Advantages of the Single Buyer Model

1. Ability to attract capital by offering long term PPAs
2. Being a workable alternative for distressed power sectors to initiate reform
3. Ability to centralize purchases, developing expertise and benefiting from economies of scale
4. Ease of implementation, in terms of not requiring fundamental changes in sector structure, deal-making and acceptability by the prevailing culture.

#### Ability to attract capital by offering long term PPAs

The Single Buyer model had the merit of attracting significant capital to the energy sector, especially in power generation. In addition, it enabled countries to have access to modern technologies that would have otherwise been difficult for them to adopt. In that sense, the model was successful. In terms of new, greenfield

plants during the 1990s, Southeast Asia alone was able to attract more capital than all of Latin American efforts both in privatization and new projects.<sup>7</sup>

As a result of the success, during the period 1991-97, contracts for 137 greenfield private power projects for 100 GW or more and worth US\$65 billion were concluded. About half of those generation projects consisted of build-own-operate and about half of build-operate-transfer schemes. Asia accounted for 103 contracts worth US\$54 billion, and Latin America for 28 projects worth US\$6.6 billion.<sup>8</sup>

A lot of this success was driven by the existence of the Single Buyer model, offering long term PPAs with sovereign guarantees.

#### Being a workable alternative for distressed power sectors

In distressed power systems, distribution companies or the integrated power utility are not creditworthy buyers due to, in many cases, absence of cost-recovery level tariffs, high losses due to lack of meters, fraud and theft, as well as low collections rates. In this kind of environment and until those inefficiencies are resolved, it is practically impossible to envision a scenario with multiple, credible buyers and sellers, particularly in small systems. The “natural” solution has been to assign only one buyer backstopped by government (sovereign) guarantees. Even if a country recognizes that fixing some of the basic commercial and technical problems is essential to the sustainability of the power sector, it is perceived that results are unlikely to be achieved in a short time frame.<sup>9</sup> Moreover, there may be complex issues of affordability<sup>10</sup> and political resistance that cannot be addressed overnight. Under those circumstances, a Single Buyer model has been viewed as the only supply-side alternative able to buttress

<sup>6</sup> Since this section refers to the “pure” Single Buyer, the advantages and disadvantages herein described may not fully apply to “enhanced” versions of the Single Buyer. Those include, inter alia, models with competitive procurement, the phase out of the monopoly status, and more flexible contractual arrangements.

<sup>7</sup> This comparison does not take into account the residual government role in the power sector. Reforms in Latin America reduced government involvement, and privatization reduced fiscal debt, therefore relieving funds for other priority areas such as health, education and poverty alleviation. IPPs in Latin America had no sovereign guarantees, even in smaller countries such as Nicaragua. On the contrary, increasing generation capacity in Asia entailed contingent liabilities and significant costs to the government.

<sup>8</sup> In the 1990-99 period, AES, an Independent Power Producer (IPP) based in the US, was the most important sponsor of independent power projects around the world, with 35 projects and a total investment of \$12.7 billion. AES, Enron and Electricité de France together accounted for more than half of the 156 projects and the total investment of \$68.2 billion during this period.

<sup>9</sup> Real world experiences have shown that improving efficiency and reducing non technical losses can be achieved faster than many times believed. What several times has delayed initiating changes was the fear of the incumbent utilities and other beneficiaries of the status quo.

<sup>10</sup> Issues on affordability involve, inter alia, a broad discussion on the issue of targeting and efficient subsidy delivery mechanisms.

capacity expansion and mitigate chronic power shortages.<sup>11</sup> What the holders of these views failed to recognize was that they were witnessing a quick fix for a supply shortage. Unless the root causes of the inefficiencies discussed above are resolved, the PPAs paid in full, and network activities received sufficient funds for investment and maintenance, a system would most likely continue to experience a power crisis. Worldwide experience has demonstrated that resolving shortages can never be as simple as signing many PPAs and building many power stations at any cost.

### Ability to centralize purchases, develop expertise and benefit from economies of scale

In very small, undeveloped or fragmented electricity systems it may be difficult to build and replicate energy procurement expertise among all distribution companies. The required expertise includes, inter alia, the preparation of power purchase agreements, tasks related to procurement (competitive or single source), negotiation with suppliers, and contract management. This knowledge was virtually non-existent (and unnecessary) in a fully integrated state owned company, where all the generation was produced “in house,” but became essential when new IPPs enter the market, particularly for efficient and fair cost entry. The Single Buyer offered a possibility of developing this expertise in a centralized fashion.<sup>12</sup>

There are other ways to accelerate the power procurement learning process and achieve economies of scale. For example, expertise may be outsourced, as was done in Northern Ireland. Furthermore, economies of scale<sup>13</sup> in purchasing may be achieved by the aggregation of multiple distribution companies represented by one single buying agent, achieving larger volumes and having more bargaining power over suppliers, particularly when the multiple off-takers are credible buyers. An interesting example is represented by the aggregation of small municipal utilities in the U.S. (Box 2).

### Box 2: Aggregation of Demand and Economies of Scale – Municipal Utilities

The typical Single Buyer entity is a mandated, top-down, government-owned enterprise—but it does not have to be designed this way. An alternative form of single buyer would be a voluntary, bottom-up buying agency, formed by a group of distribution utilities (for example municipal distribution utilities) to acquire power supplies on their behalf. The joint action agency would perform this function by buying power through contracts or by purchasing ownership interests in existing or new generating units that may also be owned by one or more vertically owned utilities, or on spot markets where they exist. Such aggregating buyer entities have existed for many years in the United States. For example in Wisconsin 37 small municipal distribution utilities, serving a population of about 250,000 people, created a jointly owned company called Wisconsin Public Power Inc. (WPPI) to cover their aggregated power needs. The goal of WPPI is to be “a smart, efficient and aggressive aggregator of power for the benefit of our member communities.” This means developing and maintaining a diverse power supply portfolio from which members may offer their customers electricity that will be more attractive than other options. In general there is little or no regulatory oversight of the actions of the joint action agencies. The rationale for this “hands-off” regulatory approach is that contrary to the typical “top-down” approach of a single buyer the joint action agency is owned and governed by its beneficiaries.

Source: Bakovic, Tenenbaum and Woolf. (2003)

<sup>11</sup> Most countries facing power shortages have underestimated the importance of working on the demand side to alleviate the crisis. This discussion goes beyond the scope of this document. For a thorough analysis on the subject, please refer to Maurer, Rosenblatt and Pereira – “Implementing Power Rationing in a Sensible Way.” ESMAP 305/2005. The World Bank (August 2005). Available at <http://www.worldbank.org/esmap>

<sup>12</sup> The original assumption was that a centralized transmission company or Ministry staff could easily obtain this expertise if procurement were to be organized in a centralized fashion. Some countries did jumpstart in the learning curve. The World Bank has provided technical assistance and expertise in the areas of procurement and contracting.

<sup>13</sup> It is also considered the issue of “lumpiness” of investments. Benefits of scale in generation can be achieved by the aggregation of smaller buyers, therefore justifying the building of more economic large-scale generation.

### Ease of implementation and acceptability for the prevailing culture

A Single Buyer model is viewed as an option that should be relatively easy to implement. It does not require radical changes in the institutional and commercial frameworks. Put simply, the incumbent utility relinquishes its right to build new capacity and signs a power purchase agreement with an independent developer. The organizational structure and institutional arrangements remain basically the same. It is much simpler than, for example, unbundling the power sector, creating an independent system operator and a wholesale market administrator. Building and operating the power plant becomes a developer’s responsibility. The Single Buyer does not have to get involved in construction, financing, system integration, technology evaluation and other similar tasks, particularly when the power plants are built on a turn-key basis.<sup>14</sup>

State-owned, vertically integrated utilities prefer the Single Buyer to other alternatives that represent more radical restructuring of the power sector (that may have an impact on the utilities themselves). The Single Buyer preserves the utility’s control over the energy traded and usually does not represent any immediate threat to the organization structure or employment levels.

From a transaction perspective, keeping the utility and the regulatory framework virtually intact has also its own merits. Government, developers and investment banks have to focus their attention primarily in the design of a PPA and related documents. Despite not being an easy task, it is still much simpler and faster than dealing with the multi-faceted and politically thorny issues of a far-flung power sector reform. Therefore, the Single Buyer, PPA and sovereign guarantees trilogy has come to be seen as the ideal solution from a fast, straightforward deal-making mentality; yet oftentimes at heavy eventual cost to the consumers, power system and society at large.

### Disadvantages of the Single Buyer Model<sup>15</sup>

Despite many of the undeniable advantages, the Single Buyer model fell short of expectations in many parts of the world. In reality, it turned out to be not as easy to implement in an efficient and sustainable manner as it was originally perceived. For many, the Single Buyer model brought more problems than those it was able to solve and the model was eventually strongly criticized as a “dangerous path toward competitive electricity markets.”<sup>16</sup> Empirical evidence suggested that, in many (albeit not all) cases, a government owned purchasing monopoly invited corruption, weakened payment discipline, and imposed high contingent liabilities upon the government.<sup>17</sup> The most important disadvantages of the Single Buyer model are summarized in Box 3, followed by a discussion of each issue.

#### Box 3: Disadvantages of the Single Buyer Model

1. Demonstrated failure to be “good’ buyers
2. Lack of transparency as a pathway to corruption
3. Rigid contractual and institutional arrangements
4. Creation of contingent liabilities
5. Inability to eliminate risks for developers as expected

#### Demonstrated failure to be “good’ buyers

Over the years, most Single Buyers, either integrated or unbundled, have failed to develop a good track record in terms of sound procurement practices. They generally lacked commercial acumen and contractual expertise. Furthermore, they tended to “gold-plate” the system by planning more capacity and signing more PPAs than necessary. In some cases, overoptimistic demand forecasts resulted in excessive contracting and

<sup>14</sup> An exception may be the case of a small system with low access, which still has to grow significantly. In such case, many technical characteristics are imposed by the Single Buyer as part of central planning of the sector.

<sup>15</sup> This section benefited from excerpts and cases at “Private Gain – Public Risk? The International Experience with Power Purchase Agreements of Private Power Projects,” by Peter Bosshard from the International Rivers Network, published on November 20, 2002.

<sup>16</sup> Lovei, Laszlo. (2000).

<sup>17</sup> This viewpoint had a great impact among World Bank client countries. It presented a harsh, nonetheless candid evaluation on the dismal performance of Single Buyer models around the world.

#### Box 4: Single Buyer procurement and the California Crisis

In an attempt to reduce the high energy price volatility and to mitigate a serious financial crisis faced by distribution utilities in 2001, the Governor of California ordered that the Department of Water Resources (DWR), a small state owned utility, be in charge of the procurement of energy on behalf of the state's three largest investor owned utilities to meet a substantial part of the market requirements. Those large utilities were close to bankruptcy due to their inability to fully pass through power purchasing costs to their retail customers, generating a financial gap of several US\$ billions. DWR had to buy energy from generators and re-sell to distribution companies. It was similar in some aspects to a Single Buyer type of arrangement. DWR did not have the required skills to carry on such a complex task, particularly in a situation where it was suspected that generators were exercising market power that was aggravating an existing shortage in available generation capacity. DWR, under intense political pressure, ended up signing medium and long-term contracts that turned out to be unsustainable. 18 Billions of US\$ were committed in contracts that soon became stranded. DWR had the merit of introducing energy contracts as financial hedges in a situation which was already out of control. However, for some experts, it should have exercised its monopsony power and carried out a more competitive process to force prices down. After high price contracts were signed, there were attempts to fix the problem by renegotiating the agreements, but resulting prices were still very high and confidence in the sanctity of contracts was undermined. Recovering those stranded costs from customers would have entailed significant tariff increases that were unlikely to be implemented. Instead California taxpayers will have to bear the consequences of such decisions for many years to come.

Source: Sweeney (2002) and World Bank analysis.

construction of new plants. This was typical in Asian countries, where available capacity could not be absorbed by demand growth due partly to overly optimistic load growth forecasts and partly to unexpected economic

recessions in the mid 1990s. As a consequence, stranded investment costs built up, contracts had to be renegotiated, and in some cases significant financial defaults resulted from the “euphoria” in contracting capacity.

Even in jurisdictions with stronger governance and more developed markets, Single Buyers did not have the incentives to make sound commercial decisions, particularly in times of crisis and when acting under political pressure. A similar situation was seen in California during the power crisis, where a state government branch played the transitory role of a quasi Single Buyer, as described in Box 4.

#### Lack of transparency as a pathway to corruption

Decisions made by a Single Buyer have been criticized for not being sufficiently transparent. Lack of transparency opens up an avenue for corruption – or at least creates a strong perception thereof.

The Single Buyer model per se does not necessarily lead to corruption. Some conditions should be in place for corruption to manifest and hurt the customer or the taxpayer. Most often than not, those conditions are of systemic nature, and are related to poor governance mechanisms.

Despite not being the culprit for systemic corruption, the Single Buyer centralizes many key decisions in the capacity expansion process in the power sector. Those decisions may include, *inter alia*, system planning, which determines the new projects or the generation capacity to be built,<sup>19</sup> how much additional generation capacity should be procured, the technical and financial requisites of the potential bidders/sellers, draft procurement documents and PPAs, selection of the sellers or the PPA award criteria, and how contracts should be negotiated. By centralizing those decisions, the Single Buyer may put in place a conduit for undue political interference which may lead to corruption.

Therefore, the excessive centralization of key decisions in environments with poor governance provides incentives for corruption to manifest itself. Some of those most relevant decisions will be discussed in turn.

<sup>18</sup> It must be noted that the contract prices were not considered so high at the time they were signed, compared to those that prevailed in the market during the shortage, with prices reaching historical peaks.

<sup>19</sup> Some Single Buyers plan specific generation projects, whereas others only determine how much new generation capacity is needed.

## Centralized Planning of the System

Planning is a genuine and useful technical component to support capacity expansion. However, it can be manipulated to serve the interests of politicians and technocrats.<sup>20</sup> The more centralized the process without consultation with or inputs from stakeholders in the power sector, the more it is subject to undue interference. Very often, load forecasts are extremely optimistic, leading to excessive contracting and over capacity. Over optimism does not affect attracting investors as, under most Power Purchase Agreements, the load growth risk is shifted to the off-taker. The Single Buyer, often responsible for the demand forecast and planning and backed by Government guarantees, has limited incentives to provide a realistic forecast.

## Non competitive procurement

In many cases, energy is procured by a Single Buyer from unsolicited projects. Procurement processes not always follow a codified competitive tender or a widely publicized auction procedure. Selected projects are not necessarily part of the least cost expansion plan but result from sometimes obscure bilateral negotiations between developers and the host countries from which projects are solicited at the time.<sup>21</sup>

This approach has resulted sometimes in contracts for power projects which were not needed, extremely attractive terms and high prices offered to the investors, and a shift of all major risks to the buyer and host governments. Favorable terms of investment, hidden costs and an oversupply of power have in several countries caused power prices to soar and led to political turmoil over power tariffs, subsidies and the renegotiation of contracts.

It is generally accepted that power procurement *per se* is the most sensitive area to assure transparency, government accountability, and to avoid corruption in a Single Buyer type of arrangement. Lack of transparency has in many cases triggered a lot of genuine political opposition.<sup>22</sup>

Many examples suggest a clear link between the lack of due process in planning and procurement and the development of unwarranted, often uneconomic private power projects, as shown in Box 5.

### Box 5: High Costs Due to Non-Competitive Power Projects and Oversupply

In the case of Enron’s Dabhol thermal power plant in Maharashtra, a company executive admitted that Enron spent “approximately US\$20 million” on the “education and project development process alone, not including any project costs”. In September 1995, Maharashtra’s government said in court that the Dabhol PPA had been procured on a non-competitive basis “by fraud and misrepresentation.”<sup>23</sup>

In the Philippines, there were concerns that many onerous PPAs could impact generation costs. Independent investigations suggested that the government was pushing the speedy approval of some of the most expensive power deals and justified signing more contracts despite warnings from within the government and from the World Bank that an impending oversupply could push prices up.<sup>24</sup>

In the Dominican Republic, CDEEE management alleges that PPAs with several IPPs, as well as subsequent negotiations held under the “Acordo de Madrid” represent energy overprice of 25%. Two of the most expensive PPAs represent a loss to the utility of about US\$ 7 million per month.<sup>25</sup>

Source: Author’s analysis

<sup>20</sup> For a discussion on how discount rate, one single methodological element in a planning process, may radically impact the least cost expansion options, refer to Becker and Maurer. Plan 2010 ignores variations in the cost of capital. *Gazeta Mercantil*. Brazil. (1990)

<sup>21</sup> This is not always the case. In Thailand and Mexico, which will be described later in this paper, a transparent competitive process was put in place, showing very satisfactory results.

<sup>22</sup> “The most perverse corruption is in the procurement of goods and services”, the Uganda Debt Network commented in May 2001. “A high proportion of grand corruption cases result from procurement” the Ministry of Finance, Planning and Economic Development confirmed in its latest Poverty Reduction Strategy Paper Progress Report.

<sup>23</sup> The World Bank in several instances expressed its views contrary to the development of Dabhol.

<sup>24</sup> Rimban and Samonte-Pesayco (2002).

<sup>25</sup> Delgado, Esteban. *Diario Libre*. Republica Dominicana. August 26, 2005.

In 1995, the state power utility TANESCO signed a PPA with investors for a 100 MW diesel-fired power plant. At the same time, a natural gas fired project was being evaluated, to be partially financed by the World Bank. The two projects together resulted in excess capacity. Furthermore, there was a suspicion of malpractice in the contract signed with the investors, which triggered a lengthy arbitration procedure. Box 6 provides details about this judicial and contentious renegotiation process.

#### Box 6: The Tanzanian IPTL Project

After extended legal battles, the project, Independent Power Tanzania Ltd. (IPTL), started supplying power to the national grid in January 2002. The World Bank's International Centre for the Settlement of Investment Disputes ruled that Tanzania was entitled to reduce the payments under the PPA signed by a previous administration. The PPA, as originally signed, agreed paying actual costs incurred by IPTL, which turned out to be a huge burden to the country's economy. On August 31, 2001, Tanzania's Finance Minister wrote in a Letter of Intent to the International Monetary Fund: TANESCO defaulted on the PPA and international arbitration was called.

"TANESCO's financial problems will be further aggravated by new financial obligations following the completion of the arbitration case concerning the costs of the Independent Power Tanzania Limited (IPTL) power plant. (...) Under normal circumstances, there will only be limited use of IPTL's capacity for some years to come and, presently, TANESCO lacks the resources to make these payments. (...) The government will allow TANESCO to increase the average electricity tariff to accommodate partly the IPTL's financial requirements and compensate for inflation since the last increase in 1998. (...) The above measures notwithstanding, TANESCO will require TSh 26 billion in support from the budget during 2001/02."

"In the final analysis it appears that IPPs have often inflated supply prices for utilities," the World Bank concluded in a Public Policy for the Private Sector Note in December 1998.

Source: World Bank Analysis

#### Confidentiality of the PPAs

The issue of confidentiality of Power Purchase Agreements compounds the absence of competitive procurement. Developers adamantly claim that the PPA contains commercially sensitive information and therefore should not be disclosed.<sup>26</sup> The argument for disclosure, so many times rebuffed by signing parties, is that the PPA is not a contract between two private parties, but commits a government, when providing guarantees, and consumers who are ultimately the ones who will pay the tariffs, over a long period (typically 15 to 30 years).

There is a growing trend towards making those PPAs as transparent and open to the public as possible:

- In the case of the Bujagali project, the World Bank Inspection Panel argued that "full disclosure of the PPA is vital if the intent is to place the public in a position to analyze, understand, and participate in informed discussion about viability of the project and its impact on the economy and well-being of Ugandans;"
- On November 12, 2002, the Uganda High Court ruled that the PPA of the Bujagali hydropower project be released to the public;
- In 2002, the Supreme Court of Belize ordered the public release of the PPA for the Chalillo hydropower project on the Macal River;

<sup>26</sup> In some cases, where the pass-through of power purchaser costs does not depend on the contractual prices, developers are even reluctant to submit their contracts to regulatory scrutiny.

## Rigid contractual and institutional arrangements

More often than not, long-term power purchase agreements have proved to be very rigid and inflexible, leading to stranded costs and creating obstacles to the migration towards a competitive power sector.<sup>27</sup>

The efficient design of a PPA requires that energy price component should correspond to the plant variable generation costs, and fixed costs (e.g. investment) should be part of the capacity payment. However, to reduce market or dispatch risks, developers prefer to charge most of their expected margins to the capacity payment itself.<sup>28</sup>

In part, investors fear that they are in the hands of one Single Buyer, whose behavior in dispatching the system and in planning future expansions is not perceived as absolutely neutral or professional. Therefore, eliminating the dispatch risk (or transferring it to fixed payment) seems to be the right thing to do, transforming the PPA into a *de facto* "take or pay" contractual arrangement.

The Single Buyer model in tandem with high "take of pay" clauses responds poorly when electricity demand falls short of projections (e.g. if there is a macroeconomic crisis or capacity turns out to be much higher than necessary). Ideally, electricity prices would fall, stimulating demand, and revenue losses would be allocated to private financiers, best equipped to manage market risks. Under the Single Buyer model, however, wholesale electricity prices rise because take-or-pay quotas must be spread over a shrinking volume of electricity

purchases.<sup>29</sup> Ensuring reliability and maintaining system reserves entails fixed costs and these costs will have to be paid for in one way or another. The pure Single Buyer model poses the risk of aggravating this problem, as a result of potential lack of discipline and perverse incentives in preparing load forecasts and contracting for new capacity.

From an institutional standpoint, long-term contracts with high energy take-or-pay obligations are a hindrance to the development of a least-cost dispatch mechanism or efficient use of available energy resources, let alone of a competitive market.<sup>30</sup> The rationale is as follows: If new, cheaper generation is built, it will be not able to compete with the existing, high volume take-or-pay energy contracts, with artificially set, very low marginal costs.<sup>31</sup> As a result, efficient plants (with lower variable costs) will not be dispatched while less efficient plants will be instructed to run. As a result, "cheaper" plants are not in a position to challenge more expensive existing ones if there are energy take or pay provisions or clauses that oblige dispatch as base load generation. Mitigating the dispatch risk becomes necessary in a Single Buyer model where a monopoly buyer makes decisions for new generation entry, generation and dispatch scheduling. More often than not, the Single Buyer overestimates demand growth, resulting in excess capacity and aggravating the above problem.

<sup>27</sup> This is not a judgment as far as the caliber of the financial advice provided to host governments is concerned. It simply reflects that energy in developing countries is to a large extent a "seller's market." Energy is in short supply and reluctant investors are in a good bargaining position to shift risks to the off-taker, particularly in those countries facing chronic power shortage problems.

<sup>28</sup> An interesting example is a PPA originally signed between the Cuiabá Power Plant (formerly developed and operated by Enron) and Eletronorte, a state owned company in Brazil, which played the role of a quasi-Single Buyer operating on a regional basis. Despite being the result of a competitive process, bidding documents were not clear on the mix between fixed and variable payments. Having more expertise and commercial acumen than its counterpart, Enron's proposal included a minor part of the payment as variable, as low as US\$ 2-3/MWh, and was awarded the contract. The developer became virtually hedged against dispatch risks, a critical feature for a plant to be commissioned under a very uncertain regulatory scenario and also behind a transmission constraint. A similar situation arose in Panama, where price offered for energy was zero and capacity very high. This is a safer strategy for investors in the early stages of market reform, where the rules of the game are still being defined.

<sup>29</sup> Laszlo Lovel, a World Bank lead expert and one of the first professionals to call the power sector's attention to the long terms problems introduced by the Single Buyer.

<sup>30</sup> Energy take or pay contracts establish an energy volume that must be paid independently on whether it is generated or not, as long as the Generator complies with a level of availability agreed in the contract. As the take or pay energy must be paid, it is considered for dispatch as zero variable cost and dispatched, even if actual generation variable costs are higher than other generation that is displaced by the take or pay generation. Some PPAs have included not only take or pay clauses but also must run provisions (e.g. mandatory baseload dispatch of available contracted generation).

<sup>31</sup> The marginal cost of a generation plant with a take or pay contract could be considered zero until the volume of the contracted take or pay is reached. While some power pools allow generators to bid a very low marginal cost ("inflexible generation," others force generators to bid the actual cost, not to distort competition and energy efficiency. This has put pressure in renegotiating and reducing the take or pay clauses.

## Contingent Liabilities

The introduction of a Single Buyer model often leads to the build up of significant liabilities to the host government and to their taxpayers. On the one hand, if the PPAs signed with a Single Buyer require sovereign guarantees, the government will backstop the payments for capacity and energy, in case the utility is not able to do so. Given the financial distress in of many distribution companies, (including the Single Buyer's lack of creditworthiness), those guarantees happen more often than it would be desirable.

In the case of the Unbundled Single Buyer model, merging the wholesale purchasing function with transmission wires creates a potential liability for the transmission company far greater than its asset base. It may jeopardize the firm's capacity to finance the wires expansion, therefore increasing the risk of transmission congestion and, in countries with low electrification rates, limiting access.

If a Single Buyer contracts excess capacity, it represents a burden on the utility and/or on the government, particularly in light of the rigid contractual arrangements described in the previous section. A few examples illustrate this point.

Indonesia's national power utility had a capacity of 14,000 MW in 1998. After the Asian financial crisis, this was sufficient to fulfill the country's demand. Yet since 1994, the Suharto government concluded Power Purchase Agreements for private power projects which would add another 11,000 MW to the system. During the economic crisis, low cost state-owned power plants had to be stopped in order to absorb the much more expensive private power.

In the case of Enron's Dabhol power plant in Maharashtra,<sup>32</sup> an official investigation committee found that the power demand projections that justified the project were "based on extremely overoptimistic assumptions". India's Central Electricity Authority warned that Maharashtra's power utility would need to stop plants generating power at 0.50-0.80 Rupees/kWh in order to buy power from Dabhol at 3.47 Rupees/kWh, because of take or pay provisions in the PPA.

Transferring risks and contingent liabilities to a third party (off-taker) distorts an economic comparison among multiple supply options. Box 7 illustrates the issue at hand.

### Box 7: Comparing Contract Economics With Different Risk Profiles

A frequent problem faced by governments is how to choose among a wide range of supply options, each one with a specific contract risk profile. For example, which one is a more advantageous option: A contract requiring a return on equity (ROE) of 18%, where the developer bears a significant portion of the market and dispatch risk, or a capacity contract with an implicit ROE of 14%? Or perhaps a "back to the old days", cost-plus regulated contract with ROE of 9%. Which one benefits (or hurts) the poor most?

This question becomes relevant when the relative attractiveness of PPAs, whose risks have been fully loaded to the energy purchaser or to the government. Needless to say, those ROE's (or tariffs resulting from a competitive procurement process) are not comparable at face value, since the contracts entail very different risks for the off-taker, customers and taxpayers. As a caveat, great care should be taken when analyzing the attractiveness of deals or PPA's whose risks have been taken away from developers and disproportionately transferred to the customers off-taker, customers, the government, and ultimately, the tax payers.

A transaction which may look financially attractive to the customer (e.g. reasonable tariffs or embedded ROEs) may be distorted by a biased distribution of risks and contingent liabilities. This is particularly concerning in countries with very low market penetration rates, where shifting risks from the customer to the taxpayer may eventually result in a very regressive taxation, with significant impact on the poor.

An evaluation of contractual options has to take those factors into account, at least on a qualitative basis.

Source: Authors' analysis

<sup>32</sup> Eventually costing 7.8 Rupees per kWh.

## Inability to eliminate risks for developers as expected

Governments believed that the Single Buyer model was a “risk-free” proposition for customers and for developers. Long term, hard currency denominated PPAs, which hedged investors against market volatility, in tandem with sovereign guarantees, seemed to be an ideal situation for private investors.

The model was touted as a perfect solution for attracting generation that would compete for the market. Its advocates alleged that investors would be willing to accept lower rates of return for the capital invested, as illustrated in Box 7. As a corollary, tariffs would be lower. It seemed to be a win-win situation.

However, reality proved to be quite different. In some cases, an environment conducive to corruption and nepotism inflated prices. Investors were not always convinced about the alleged macro-economic stability; nor could they possibly count on the long-term sanctity of contracts resulting from sweetheart deals. Therefore, high rates of return were in many cases embedded in the contract prices.<sup>33</sup>

On the government side, overoptimistic expectations of modest rates of return (which in some cases did not materialize) ignored the fact that in a typical Single Buyer arrangement most risks - such as demand volatility, market prices, exchange rate devaluation, and stranded costs - were fully allocated to the off-taker. In certain countries, such as Thailand, Malaysia, the Philippines, and Indonesia those risks ended up representing billions of US dollars.

In some cases, prompted by macroeconomic crisis, governments defaulted on their PPA obligations, and investors had to post significant losses in their books, even for agreements with apparently “rock-solid” sovereign guarantees. With the benefit of hindsight, it was naïve to assume that countries hit by major crises would honor their contractual obligations, particularly in cases where the deals were conspicuously lopsided and subject to heavy public criticism. In sum, the risk profile of the Single Buyer model was grossly misinterpreted, from the point of view of developers, customers and taxpayers.

### Box 8: Issues Regarding the Indonesia Single Buyer IPP Program

During the 1990s, escalating electricity demand and limited public resources throughout East Asia left many countries little choice but to invite foreign investment in new power plants. While the programs brought positive results by reducing (or in some cases eliminating) power shortages, and while it is difficult to quantify the cost of power shortages had the IPP programs not been implemented, they also created serious problems that were exacerbated by the regional financial crisis:

(a) In some countries, costly power shortages were reduced, but in many cases more capacity was added than was needed, and some corruptly benefited from lucrative transactions.

(b) Governments often protected the IPPs against market risks (and sometimes fuel supply risks) through long-term take-or-pay contracts, and created huge contingent liabilities for the countries, particularly since the currency risks were often covered by indexing power purchase prices to hard currencies.

(c) While subsidies for capital costs were reduced, the IPPs sometimes increased the Government-owned utilities’ supply costs, often through uncompetitive bidding practices.

(d) Although IPP programs were intended to break up sector monopolies, the terms of their PPAs often created rigidities that caused the systems to operate inefficiently and complicated the sector’s further liberalization.

These issues were particularly pronounced in Indonesia, where 26 primarily US\$-denominated PPAs were signed between the IPP sponsors and PLN for about US\$18 billion, which added roughly 11,000 MW of capacity. Funds for these IPPs were secured from international sources, but predominantly from unsolicited proposals. Although the Government did not issue explicit guarantees, “letters of support” were given to the IPPs through which the Ministry of Finance (MOF) or the Ministry of Mines and Energy (MEMR) required PLN to perform its obligations. As the result of the crisis and devaluation of the Rupiah, the Government—faced with huge debt—postponed some IPP projects and directed PLN to reimburse only part of its obligations

<sup>33</sup> The expected rate of return for the Dhabol project, for example, was about 24% p.a.

#### Box 8: Issues Regarding the Indonesia Single Buyer IPP Program, con't

to the operating IPPs. Investor response was mixed, depending on whether each took a short or long-term view of its involvement; in the most extreme cases, the Government was sued and in one, an international arbitration panel ruled in favor of the IPP.

The Government has settled or renegotiated all the disputes with the IPPs, excluding the case mentioned above, and has done a commendable job in renegotiating prices, keeping its commitment and protecting the contracts. However, at least two aspects of the agreements have created serious problems. They have produced a huge contingent liability for the Government and the PPAs have captured, for the next 30 years, a sizeable share of the power market under a set tariff and "dispatchability" level which heavily affects the future market.

Source: World Bank (2004)

Several large-scale PPA programs, based on Single Buyers, ended up failing. As an example, Box 8 illustrates some of those aspects observed in the development of the IPP program in Indonesia.

## 4. EXPANDING THE CONCEPT OF SINGLE BUYER

### *Variations of Single Buyer Models*

Recent studies carried out by the World Bank have shown<sup>34</sup> that there is not a single way to implement what has imprecisely still referred as "the" Single Buyer model. The concept has been over stretched in the last few years.

For example, the entity referred to as the "Single Buyer" in Austria encompasses more than one wholesale buyer. In July 1997 the Austrian Federal Economic Minister proposed a draft for electricity reform with several "Single Buyers", corresponding to the existing 15 provincial utilities, the 5 municipal utilities and the national electricity wholesale company.

In other cases, what is referred to as a Single Buyer is not even a "buyer," since it does not necessarily own the energy traded. Its responsibilities could be more appropriately described as a "broker" or load aggregator, rather than a single, monopolistic agent, since there may be multiple buyers and sellers in the market.

In Italy, the Acquirente Unico, is also referred as a "Single Buyer,"<sup>35</sup> despite the fact that: (i) it is involved in the procurement of energy only for small customers who did not switch suppliers (a condition called, default supplier, in an environment of full retail competition); and (ii) discussions were going on as to the merit of having the Single Buyer acquiring energy, in light of the likely creditworthiness of distribution companies.

Single Buyers may also be introduced under a great variety of industry and commercial arrangements. Given this diversity, what are the common features among those models referred as "Single Buyers" The common thread is the fact that all those models, in one way or another, entail some form of centralized purchasing arrangements. That is, there is a mechanism and in some cases an organization responsible for some form of coordination in the procurement and contracting of power. It refers to an arrangement where the coordination of all, or a significant part of, the wholesale power procurement is carried out by an organization through a codified process.

<sup>34</sup> See references at the end of this report, documents related to the Single Buyer between 2003 and 2004.

<sup>35</sup> NERA. David Salant. The Acquirente Unico in Italy.

The power procurement activity, in a broad sense, may encompass a series of functions, including:

- Designing standard conditions for bilateral contracts or PPAs;<sup>36</sup>
- Drafting bilateral contracts or PPA for a specific procurement;
- Administering the procurement process (procurement documents, auction, contract awarding, etc.);
- Negotiating contracts;
- Assigning or signing contracts with distribution companies;
- Administering long and medium term power purchases.<sup>37</sup>

### **Taking “Title” For the Energy – A Fundamental Aspect**

A “pure” Single Buyer, by definition, takes the ownership title for the energy traded. It signs PPAs with independent producers and re-sells this energy to distribution companies.

However, there may be variations of this purchasing arrangement where no central agent takes the title for the energy traded. In such centralized purchasing arrangements, the central agent’s role in this case is to aggregate demand from multiple distribution companies, coordinate the energy procurement process, and allocate energy contracts volumes among the off-takers (usually distribution companies).

This demand aggregation role has been observed in some States in the US, New Jersey being one of the pioneers. The idea is also gaining momentum in some developing markets, such as in Brazil. As of 2004, it is mandatory that all the energy procured by Brazilian distribution companies be acquired via an auction-like process, coordinated by the Ministry of Mines and Energy and approved by the regulatory authority.

This distinction leads to two different possible roles played by a central agent – active and passive.

- Active: The central agent takes ownership of energy and payment risk. In this case, the agent is the bulk purchaser and reseller through back-to-back contracts of bulk supply. It receives payments from distribution companies, exporters, and eligible consumers, and makes payments to bulk sellers (generators, importers).
- Passive: The central agent (or process) does not directly buy energy to resell, but instead acts as a load aggregator, and intermediates purchases or conducts the administration of power procurement. It may also assist distribution companies or other purchasers in contract invoicing and contract disputes.

The difference between active and passive agents is a fundamental aspect as far as the performance of the procurement function is concerned. Many of the flaws and criticisms of the pure Single Buyer happen by virtue of its role as an active buyer. As the name suggests, in this case, a central agent has more control and ownership of the process of procurement, which lends itself to be more centralized and secretive. Also, Single Buyers take price and market risk, which may result in significant financial imbalances between generators and the Single Buyer – to be passed through to customers and /or to taxpayers.

When distribution companies are the buyers, under the orchestration of a centralized purchasing process, some of those problems may be mitigated. For instance, procurement tends to be more transparent, as there are more players involved in the decision-making.<sup>38</sup> Moreover, distribution companies have a better knowledge about their markets and are not willing to over contract, if they will fully bear the financial costs of their good or bad decisions.

Those observations are of directional nature, and by no means should be construed as prescriptive. The real flaws or successes of any energy commercial arrangement depend on the design details and on careful implementation.

<sup>36</sup> This is a separate function that, as defined in this paper, does not involve in competitive Electricity Markets the market operator.

<sup>37</sup> The expression “long and medium term contracts” refers to all bilateral contracts agreed in advance. Trading (purchases and sales) in a Day Ahead Market or Balancing Market are considered in this document as short term.

<sup>38</sup> As already pointed out, the success and behavior of a procurement agency depends not only on market design issues, but also on structural ones. Therefore, a pure Single Buyer, even taking the title for the energy, may still circumvent some of the corruption problems if there is a strong will by the government to work on a transparent, efficient and competitive energy purchasing process.

## Possible Functions Carried Out by a Central Agent

In the Single Buyer models the central agents are accountable for more than buying and selling of energy, if they do indeed perform those functions as part of centralized purchasing arrangements, and may carry out many other responsibilities, which are usually bundled in vertically integrated companies.

Empirical evidence has revealed that the trading function may be associated with one or more activities. The level of bundling on these activities depends on the market and industry structure in place. Some of those most important associated functions include the following:

- 1) Transmission planning<sup>39</sup>
  - Planning transmission expansion and upgrades, including international interconnections
- 2) Provider of transmission services
  - Providing transmission services on existing grid, including international interconnections
  - Expanding and/or upgrading the transmission system
  - Administering third party access
  - Submitting and implementing regulated transmission charges
  - Managing congestion and losses (optional)<sup>40</sup>
- 3) Planning generation expansion and cross border trading
  - Forecasting load requirements of each distribution company and/or of the system as a whole
  - Evaluating technical and least cost expansion alternatives

- 4) Power system operator<sup>41</sup>
  - Performing transmission and generation maintenance outage coordination
  - Scheduling and dispatching generation.
  - Administering and purchasing ancillary services
  - Balancing the system and managing congestion
  - Administering the allocation of international interconnection capacity
- 5) Market operator<sup>42</sup>
  - Administering spot market or a balancing mechanism
  - Administering commercial metering and contract settlement

There is no ideal blueprint on how those functions should be grouped and which ones should be carried out by a central agent under a centralized purchasing arrangement. At the early stages of power sector reform (e.g. a Single Buyer that is an integrated utility) the central agent is assigned many functions in addition to the core functions of buying and selling. Those additional functions may include capacity and transmission system planning, dispatch and system operation, maintenance coordination of transmission and generation assets, energy trading, and many others. Table 1 illustrates a typical “unbundling” of those functions as power sector evolves. The cells marked with a cross show the functions typically assigned to various central agents, demonstrating how the number of functions goes down as the sector is restructured and moves towards competitive market arrangements. As the table shows, at the early stages of power sector reform, the central agent is responsible for carrying out all or most of the functions described above. As the sector evolves, there is a tendency to unbundle the power sector. When wholesale competition is possible, with multiple buyers and sellers, the role of the central agent ends up being significantly reduced, focusing on the purchasing of electricity and management of the resulting contracts. At later stages of power sector

<sup>39</sup> Transmission expansion per se (and/or ownership of transmission assets) is a transmission company typical responsibility, not a function of the Single Buyer or of any entity in centralized purchasing arrangements. Even if both roles (transmission and wholesale purchasers) are combined into one company, it is important to establish a functional separation between the buying/selling of energy and running the transmission business. Approval of, or regulation on decisions regarding new transmission investment, should be assigned to the Regulatory Authority.

<sup>40</sup> If the transmission service provider is merged with system operator, the result is a Transmission System Operator (TSO), sometimes also referred to as a “Transco” type of organization. – Specific regulations will establish who bears the cost of transmission losses and congestion and how those costs (or recognized costs) should be recovered.

<sup>41</sup> Two functions have been differentiated, system operator and market operator, depending on electricity trading arrangements. However, both functions may be combined in one: a system and market operator, as has been the case in the US.

<sup>42</sup> Depending on the market design, those responsibilities may belong to the system operator. There is also some ambiguity as far as the correct definition of market and system operation is concerned, but such market design considerations goes beyond the scope of this paper.

**Table 1. Evolution of Functions of Central Agent**

VARIATION OF CENTRAL PURCHASING AGENT		INTEGRATED SINGLE BUYER	RESTRUCTURED SINGLE BUYER	WHOLESALE COMPETITION	RETAIL COMPETITION	PROVIDER OF LAST RESORT
	Status	Active	Active	Active	Active	Passive
	Role	Integrated utility	Transmission Company	Market Operator	Wholesale Trader	Procurement Agency
FUNCTIONS						
	Integrated Utility	x				
	Transmission Planning	x	x			
	Transmission Services	x	x			
	System Operation	x	x			
	Generation Planning	x	x			
	Market Administration	x	x	x		
	Purchaser of Electricity	x	x	x	x	
	Administrator Procurement of Contracts/PPAs	x	x	x	x	x

development, the central agent becomes a passive buyer and no longer acquires energy in the market. Instead, it is solely responsible for administering and reassigning contracts among distribution companies. That is the case, for example, in countries with full retail competition where the utility plays the role of provider of last resort.

Worldwide experience shows that there are also multiple ways of organizing those functions, ranging from a complete merging of all responsibilities under a single organization, to a situation where the central agent is solely a broker. Table 2 illustrates this great variety.

The responsibilities assigned to central agents change as power sector reform evolves. Proposed or ongoing reforms in several countries’ power sectors envision a gradual “unbundling” of central agent functions, resulting in less responsibility and more specialization. Table 2 provides a few examples from different countries, showing how the allocation of functions is in a state of flux, as power sector reform progresses and the centralized purchasing roles are consolidated. It uses symbols and color-coding to illustrate the change. The first two rows

of the table show the country and company/entity that originally operated as the central agent prior to the reform, respectively. In the second row, if the cell with the entity name is blank, it means that prior to reform, there was no entity with a centralized purchasing role, as in the case of Brazil and Italy. The cells with check marks show the functions assigned to the original central agent. The blue-shaded cells with check marks correspond to the functions that remain with the central agent in the new model, while the un-shaded cells with checkmarks mean that a particular function is now assigned to another entity, instead of the original central agent. The cells with crosses identify the functions assigned to a newly-created central agent that did not exist prior to reform.

Tanzania is an illustrative example. Currently, TANESCO, the vertically integrated utility, plays the role of an active Single Buyer. The new sector design envisages the establishment of an unbundled administrator of long and medium term purchases, whereby contracts are signed directly between the IPP and Distribution Companies.

**Table 2. Proposed Centralized Purchasing Arrangements**

	HONDURAS	JORDAN	INDONESIA	THAILAND	VIETNAM	CAMBODIA	SICHUAN	NIGERIA	ITALY	UKRAINE	BRAZIL	TANZANIA
Entity	ENEE (utility)	NEPCO (utility)	PLN (utility)	EGAT (utility)	EVN (utility)	EDC (utility)	SPEC Dispatch Center	NEPA (utility)		Energo-market		TANESCO (utility)
FUNCTIONS												
Transmission Planning	<input checked="" type="checkbox"/>							<input checked="" type="checkbox"/>				
Provider of Transmission Services	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>					
Planning Generation Expansion and Cross Border Trading	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>				
System Operator	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>							
Market Operator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	x	
Administrator of Long and Medium Term Purchases	<input checked="" type="checkbox"/>	x		x	<input checked="" type="checkbox"/>							
Purchaser of Electricity	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	x			<input checked="" type="checkbox"/>					

**Table 3. Perceived benefits of the Single Buyer model that can be preserved**

Perceived Benefits of the Single Buyer Model	How a Centralized Purchasing Arrangement Can Still Contribute
Ability to attract capital by offering long term PPAs	PPAs can still be offered, providing the necessary comfort for investors to build power plants. However, some centralized purchasing arrangements do not require central ownership for the energy, neither the Single Buyer needs to be granted a de jure monopsony/monopoly status
Being a workable alternative for distressed power sectors to initiate reform	Similar results can be achieved, as long as credit, market, and regulatory risks are minimized, at least at the critical initial phases of the power reform
Ability to centralize purchases, developing expertise and benefiting from economies of scale	A centralized purchasing arrangement can equally include mechanisms to rapidly develop procurement capabilities, achieve economies of scale, and start disseminating this expertise among the potential future players, as conditions permit
Ease of implementation, in terms of not requiring fundamental changes in sector structure, and the consequent acceptability for the prevailing culture	Ease of implementation is potentially deceiving, as new problems may result in the future, such as stranded contracts. Less opposition from the incumbent utility is not necessarily a plus. As a minimum, the buyer has to develop competitive, transparent procurement mechanism.

## 5. MITIGATING SOME PROBLEMS OF THE SINGLE BUYER WHILE PRESERVING ADVANTAGES

This section presents some practical considerations that could improve the Single Buyer model and make it more efficient. Some modified institutional and commercial arrangements, can address some problems associated with the “pure” Single Buyer model and at the same time preserve many of its perceived benefits.

### **Benefits to be preserved**

This section addresses some of the key perceived benefits of the Single Buyer that one wants to maintain by preserving some form of centralized purchasing arrangement. This alternative form may (or may not) include a separate entity in charge of procuring energy and/or taking the title. Table 3 summarizes the benefits of the Single Buyer and how a more flexible central purchasing arrangement can still preserve most of those benefits.

### **Mitigating Some Problems of the Single Buyer Model**

The problems associated with the Single Buyer model can be mitigated with measures designed to incorporate greater flexibility, transparency and a longer term vision into the power sector reform process. Some of the design factors critical for success are described as follows.

#### **Organizational structure and key procurement processes should be as transparent as possible**

This paper underscores the importance of transparency as an antidote to cronyism and corruption. Procurement of new generation encompasses several phases and starts with power system planning, when load is forecasted and preliminary least cost target projects are determined to achieve generation adequacy. Once a portfolio of preferred projects is selected, the next step is to choose the most efficient among those – ideally via a competitive, technology-neutral procurement type of process.

Transparency, the presence of codified rules such as a Grid Code, due process, regulatory independence, and many other attributes are essential to assure that the projects and sellers are selected on their own merits. A transparent mechanism should contain all the following elements.

#### **Box 9: Critical measures for mitigating problems associated with the Single Buyer**

1. Organizational structure and key procurement processes should be as transparent as possible
2. The purchasing agent should not be granted a monopoly status
3. The purchasing agent should not take ownership for the energy traded, and instead act like a broker, when market conditions permit
4. Roles and responsibilities of the purchasing agent should be unbundled to a reasonable extent in order to enable some checks and balances
5. More flexible contractual arrangements should be utilized
6. There should be a game plan to allow power sector reform to evolve
7. Sovereign guarantees should be granted on a selective basis
8. There need to be clear, codified rules to assure transparency, accountability and good performance

#### **A Sound System Planning Process**

A good planning process is a very important step in determining the need for additional generation capacity within reasonable load projection ranges. It encompasses the selection of potential sites, sequencing of plants, and main technologies to support expansion. It is meant to be an analytical process, but as already pointed out planning can be interfered with by politicians and others. Therefore, efficient and adequate planning may be a necessary, but not sufficient, condition for a transparent and sustainable power sector.

In countries at the early stages of power sector reform, planning activities are usually under the responsibility of the government owned utility or are sometimes under the purview of the Energy Ministry. However, many of the poorest developing countries do not yet have sufficient capacity in power sector planning. They lack the skills, software models and processes, and often must rely on consultants’ or on donors’ advice on an

ad-hoc basis. Unfortunately, the advice may be biased towards some particular technology, project, or source of funds.

If there is a structured and elaborate planning capability, it is less likely that unsolicited, single sourced projects will emerge. Or if they do, it becomes more conspicuous. Countries that have no tradition of carrying out least cost planning on a continuous basis, may not be capable of assessing whether or not a particular unsolicited project is indeed the best alternative for its power system, taking into account other potential generation alternatives, impact on transmission investments, and interconnection to neighboring countries. It is easy for a country to fall victim to suboptimal options under those circumstances.

A sound planning process should also take into account the demand side of the market. Demand should be an integral part of the planning process, including, inter alia, considerations on price elasticity, energy efficiency, rational use of energy, affordability, and willingness to pay. Those aspects are often ignored or addressed superficially in the overall plans. Demand forecasts do not properly take into account the demand price elasticity and therefore underestimate the importance of proper pricing on the energy conservation efforts. Box 10 illustrates the specific case of Dominican Republic. In that country, a distorted tariff policy has led to explosive demand growth. The power system has been undermined by unsustainable subsidies, not necessarily targeted to the poor. Lack of revenues or collection in the sector has resulted in chronic financial “blackouts,” despite existence of excess capacity.

Developing a sound system plan is a must. In tandem with this effort, donors and multilateral institutions should help poor countries prepare systematic and codified planning processes, spelling out who and when should carry on those plans, how often they should be revised, what the kinds of public hearings or industry consultation are required to assure maximum transparency, who has the necessary approval authority to alter the plans.

At the early stages of power sector reform, developing the utility’s system planning internal capability and enhancing in-house planning skills is a crucial step and should be considered a sector priority. A central purchasing agent could in principle carry out most of the system

#### Box 10: Dominican Republic – Lack of an Integrated Planning Approach

As an attempt to alleviate chronic power shortages that had been plaguing the Dominican Republic for many years, the state owned company, acting as a quasi Single Buyer, decided to sign several PPAs with new private developers. More than US\$1 billion was invested, including a natural gas terminal and natural gas fired power plants. Today, the country has significant excess capacity, but is still facing daily black-outs. Despite all the capacity made available, generators are not able to collect money from distribution companies, which, in turn, complain about theft, rampant fraud and non-payment. It is a so called “financial black out.”<sup>43</sup> More than 500,000 customers are not metered. To aggravate matters, there is a culture of non-payment. Both factors have resulted in a wasteful use of expensive resources.

The approach followed to alleviating shortages was biased toward supply side solutions, which were ineffective to deal with a much more comprehensive and intermingled problem of supply and demand imbalance.

Source: Author’s analysis.

planning and evaluation technical work. However, an integrated organizational structure does not offer the necessary checks and balances to assure a transparent process unless a consultation or public hearing process is included.

In more developed power systems, the central purchasing agent has a more limited role in system planning. It serves to aggregate the demand forecast prepared by distribution companies and to procure the energy volumes on a consolidated basis. However, the agent does not “second guess” demand forecasts and does not necessarily decide on the best generation projects. Generation investors will compete to provide the cheapest energy and procurement will take place on a competitive basis. This subject of competitive procurement will be described in the next section.

<sup>43</sup> See Maurer, Pereira and Rosenblatt. (2005)

## Competitive Procurement for Power

This report considers a competitive procurement for power (capacity and energy) as the single most important step to mitigate many of the problems associated with the pure Single Buyers.

In principle, the procurement of all energy by a central agent (in particular by a monopolistic Single Buyer) should be carried out through some form of competitive mechanism. This statement holds true both for new, greenfield plants, as well as for existing generation to be contracted or re-contracted. Exceptional situations apart, such as natural disasters and the like,<sup>44</sup> there should always be room for competitive procurement. This proposition becomes especially important when the entity at the core of the central purchasing arrangement takes title of the energy, serves captive consumers, and/or acts as a supplier of last resort.

Many professionals from the World Bank have been strong advocates of competitive procurement, as illustrated in Box 11.

Several countries have also realized the importance of competitive procurement and have made some progress in this direction. The first area of progress was to establish the principles or conditions under which a central agent should be allowed to procure competitively or directly (on an exceptional basis).

In Cambodia, the power sector model was designed based on acknowledgement of the fact that unsolicited projects would exist for some time. Under the current market design, generation procurement guidelines establish how unsolicited projects should be administered. According to this design, unsolicited projects are included as alternatives in the system plan and are selected if they correspond to the least cost option. This allows for transparency and least cost decisions in new generation entry.

### Box 11: World Bank Views on the Need for Competitive Procurement

The World Bank, in a Public Policy for the Private Sector Note of December 1998, acknowledged that “bidding seems to have reduced PPA prices by 25 percent on average”, and recommended “discouraging the widespread practice of noncompetitive procurement of goods”. “[P]rovided that sufficient interest can be attracted from bidders, governments, and utilities can obtain better terms for the host country under competitive bidding for proposals from IPPs than under noncompetitive negotiated deals.”<sup>45</sup>

Competitive bidding also reduces the risk of political resistance against projects. “The transparency of the process by which a project concession is awarded also is a strong determinant of the level of political risk faced by the sponsors. In general, competitively bid concessions face low levels of political risk and command better financing terms in the marketplace.”

In a World Bank study published in 2003,<sup>46</sup> Arizu, Maurer and Tenenbaum, pointed out that a competitive bid is the best methodology to assure transparency and fairness in the energy procurement process. Additionally, it brings an elegant solution to the complex issue of pass through of the power purchase costs, since prices resulting from the competitive bid should be the basis for pass-through. Lastly, a competitive bidding process, if carried out on a level playing field basis, mitigates many of the problems resulting from self-dealing transactions. For all those reasons, the authors strongly recommend the use of mandated competitive procurement for the great majority of the energy acquired by distribution companies. The regulatory agency should provide the basic guidelines for the auction, and monitor the process to ensure fairness and transparency.

Source: Authors’ analysis.

<sup>44</sup> A shortage crisis should not be an excuse to waive competitive procurement either. Except in a few situations, where load shedding is caused by unexpected unavailability of existing power plants, rationing can be anticipated and prepared for. It is possible to carry out a competitive process on an expedited basis. That was the case in Brazil during the 2001-2002 rationing crises when the government acting as a central purchaser for thermal back-up reserves, decided to establish 3-year contracts for about 3,000 MW of new thermal generation to help mitigate the crisis. Questions were raised about the high prices paid for this capacity, which simply reflected the tight supply demand balance at that time. The procurement process was transparent and competitive despite being carried out under a very short timeframe.

<sup>45</sup> Robert Bacon and John Besant-Jones (2001).

<sup>46</sup> Arizu, Maurer and Tenenbaum (2004).

Some countries have adopted competitive procurement on a regular basis. Thailand is an example of competitive procurement processes which have been used for more than 10 years. Details are described in Box 12.

Competition is also possible for the development of hydropower. Brazil, for example, has developed two alternative schemes that have successfully attracted private capital and enabled competition. Reductions in cost and time of construction have been remarkable, as a result of competition process and of the participation

of private capital. In one of the schemes, the government bids the rights to use a certain hydropower development site. The winner is the developer who offers the highest price for the concession (similar to a royalty, to be paid over the life of the concession). According to this scheme, the winner has the freedom to trade this energy the way the investor pleases, either via long-term contracts or on a merchant basis. More recently, Brazil has introduced a variant of the scheme, where the plant site and an associated PPA are put for bid jointly. The winner of a particular concession is the one who promises to deliver energy at the lowest price. Recent

### Box 12: Thailand's Experience in Energy Procurement

In Thailand, state-owned Electricity Generating Authority of Thailand (EGAT) is responsible for generation and transmission, while power is distributed by two state-owned entities. A 1992 Amendment of the EGAT Act ended EGAT's monopoly over power generation, allowing private sector investment in power generation projects in the form of Small Power Producers (SPP) and IPP, both of which sell power to EGAT under single buyer modality. SPPs are small power projects that are either cogenerators or renewable energy, which can sell power directly to consumers and in addition sell to EGAT up to 90 MW for each project.

EGAT has since 1992 used a competitive procurement process to buy energy from SPPs or from IPPs. Since its inception, 110 proposals have been received and 71 SPPs have been accepted and obliged to supply power. The bidding uses an objective and transparent scoring and evaluation process modeled after the PURPA system in the US.

In August 1994, EGAT commenced solicitation of large-scale IPPs, for 1,400MW for 1996-2000 (Phase 1) and a further 2,800MW for 2001-2002 (Phase 2). In July 1996, the Phase 1 program was increased to 1,750MW and Phase 2 to 4,200MW and PPA (20 and 25 year) was signed with 7 IPPs with the combined capacity of 5,950MW. Economic slowdown and associated slowdown in power demand led EGAT's power development plan to be adjusted downward. The last of the 7 IPPs, the BLCF project, with total financing requirements of US\$1.4 billion reached financial closure in 2003 and was funded by US\$400 million equity and US\$1 billion debt without Government guarantee for EGAT contractual payment obligations under 25-year PPA.

Private investors and commercial and multilateral/bilateral lenders/guarantors view EGAT credit favorably. EGAT is rated high-BBB, the same with the sovereign government, because of: proven strong support from the Ministry of Finance (which has previously guaranteed all foreign debt and 90% of domestic debt of EGAT; the existing regulations/ EGAT Charter obliging the government to cover cash flow deficiencies in the event EGAT cannot obtain from other sources); strong market position; automatic tariff adjustment mechanism which protects EGAT from increases in uncontrollable costs (fuel price, foreign exchange fluctuation, power purchases and inflation) and sound operating history. The legal system, foreign exchange markets and local financing markets are relatively well developed in Thailand, allowing limited-recourse project finance for large-scale projects.

The Government has scrapped plans for the introduction of a competitive power pool due to opposition from utilities and unions and uncertainties about the complexity of pool operations; and decided to adopt the so-called Enhanced Single Buyer Model for the electricity supply industry which provides for: (i) EGAT continuing to be a sole buyer, dispatcher and bulk transporter of electricity; and (ii) EGAT and the state owned distribution companies introducing accounting separation for each of their business units and to be corporatized as a whole and listed on the stock exchange through IPO.

Source: Adapted from Tomoko Matsukawa. World Bank (2005) Unpublished.

auctions carried out in 2004, where most of the supply was hydropower based, proved to be quite transparent and competitive.

When the power system in Brazil was being restructured in 1997, several options were considered for competitive procurement to build hydro plants. These options, illustrated in Box 13, may serve as workable alternatives to other countries. At that time, Option 1 was suggested as a transitional measure to ensure that new capacity continued to be built for the period before the new power sector model was implemented. Both Options 2 and 3 are competitive forms of tendering concessions.<sup>47</sup>

Competitive procurement requires rules and skills, not always readily available in some of the World Bank's client countries. For example, designing an energy auction is a very specialized task, and a lot of customization needs to be done in terms of definition of objectives, specification of the product to be offered, contract preparation, auction design and process monitoring. Professional and independent views and expert advice may be acquired.

The World Bank has also supported some of its client countries to develop processes and organizations to carry on competitive procurement for power. A recent experience in Vietnam is described in Box 13.

### Confidentiality of the PPAs

There is a long tradition in the power sector that energy contracts are commercially sensitive and therefore should not be publicly disclosed. This may be valid in the non-franchised business,<sup>48</sup> but not for a regulated company where the full costs and consequences of contracting are to be borne by the customers (and in some cases taxpayers). The long standing argument for contract confidentiality has been recently challenged in courts.

This paper shares the voiced concerns about contract confidentiality, but claims that there should be a better trade-off between commercial sensitive information and transparency. Contracts resulting from a competitive procurement process that are paid by consumers (regulated tariffs) should, almost by default, be in the

### Box 13: Alternatives to introduce competitive procurement in hydro-generation

(a) Option 1: Administrative Allocation. The key feature of this option is that distribution and retail companies would be allocated particular sites by the Indicative Planner and given responsibility for undertaking competitive tenders for the concession contracts. The distribution and retail companies who tendered the concession would undertake to purchase the energy from the concession holders. The bidder offering the lowest tariff per kWh of firm energy would be awarded the concession. A pre-determined standard concession fee would be payable to the Granting Authority.

(b) Option 2: Simple tender to all eligible parties. Under this option, the Granting Authority would undertake the tendering of concessions directly. All interested parties would be eligible to bid for the concession and would be responsible for identifying a market for the energy. The bid would consist of the concession fee to be paid to the Granting Authority in each year of the concession, which would be equal to or greater than the standard fees defined by the Granting Authority. The winning bidder would be the one offering the highest present value of concession fees.

(c) Option 3: Purchase offers followed by concession tender. This option is based on the idea that ahead of the tender for the generation concession, distribution and retail companies (and possibly eligible consumers) would make binding offers to buy energy from the project. Generators would then bid for the concession with known purchase commitments, on the basis of the highest present value of concession fees. The winning bidder would be free, but not obliged, to take up the long term contracts offered by the distribution and retail companies. This would allow self-producers or IPPs with other potential markets to bid for the concessions.

Source: RE-SEB Project, Coopers & Lybrand Consortium, Eletrobrás-MME. Brazil. (1998)

<sup>47</sup> Brazil ended up moving to Option 2 and subsequently migrated to a variation of Option 3.

<sup>48</sup> Example of an IPP selling to free customers, at freely negotiated terms and conditions.

#### Box 14: Vietnam's experience with competitive power procurement

Electricity demand in Vietnam increased at about 14% per annum over the period of 1995-2000. The Government decided to promote private sector participation in order to address the need for increased power generation. The World Bank assisted the Government to prepare and conduct bidding for the Phu My 2-2 (715MW gas-fired) power project under the BOT scheme, which sells power to a state-owned integrated utility EVN under a 20-year PPA and is supplied gas from a newly-developed offshore gas field via a state-owned PV under a 20-year GSA. The government issued the Request for Proposals in late 1997, and offered an International Development Association (IDA) Partial Risk Guarantee (PRG) backstopping government guarantees (covering Vietnamese contractual undertaking and foreign exchange availability/ convertibility/ transferability) up to US\$75 million in support of commercial debt financing as an option to the bidders. Six strong international consortia submitted bids and the EDFI-led consortium was awarded the project in 1999. Key project documents including the BOT Contract were signed and the Investment License was issued in 2001. Financing documents were signed in 2002 and the plant was commissioned in early 2005.

The project became the first infrastructure project in the country for which the sponsor was selected through competitive bidding and the largest foreign investment outside the oil and gas sectors. Tariffs proposed by bidders reflected the Government undertaking, prospective availability of IDA PRG and enhanced competition, and resulted in much lower tariff level compared with what the Government had negotiated for other private power projects. The closure of this deal heightened the interest of the Government in promoting private projects in key infrastructure sectors such as power generation.

The Government hopes that the IPPs (including ones to be set up by the state-owned entities) will account for over a half of total incremental power production and recently announced its intention to start preparing the next batch of BOT power projects for competitive bidding to meet energy future demand needs.

Source: Adapted from Tomoko Matsukawa. World Bank. (2005) Unpublished.

public domain and there should be no room for further negotiation. If all energy is to be procured competitively, as a corollary, all contracts should be publicly disclosed. This should be the case even in a situation where the government assumes that only a few bidders will participate in the process. There should still be contestability and the principles of competition apply.

Countries are moving in the direction of more transparency. In several cases where an Electricity Regulatory Commission exists, a new PPA or contract proposed by a central purchasing agent requires prior approval by the Regulator, and such approval is subject to compliance with procurement rules or guidelines. One interesting case is Cambodia, where the Regulator must assess and inform the Government and the public in general about the expected impact of a new PPA in the final consumers' tariffs, thereby creating a climate for an open discussion on issues such as affordability and the risks that may be faced by the investor.

#### The Single Buyer should not be granted a monopoly status

Single Buyers should not be given a de jure monopoly status, even if competition is not workable at the outset. It is possible to preserve the benefits of scale and expertise, observed in pure Single Buyers, even in the absence of a monopoly status. The market in which Single Buyers (or central purchasing agents) operate should be perceived as contestable, even if competition is not workable at the outset.

The existence of a monopoly wholesale purchaser (as present in both in the Integrated Single Buyer and the Unbundled Single Buyer) is one of the factors that have led to the establishment of long-term (and sometimes inflexible) PPAs. Investors want to make sure that, once the generation capacity has been built, the purchasing entity will not abuse its monopoly position. As a consequence, the PPA design has tended to allocate most (or all) market risks, such as load growth, to the purchaser or the government (through government guarantees or implementation agreements). This can lead to inefficiencies and eventually stranded costs as discussed before.<sup>49</sup>

Contract design is about risk allocation. If there is only one wholesale buyer in the power sector, it becomes very difficult to create more flexible trading

<sup>49</sup> This issue has been evaluated in different papers. References can be found at the end of this paper.

arrangements or avoid allocating certain risks to the purchaser. Arrangements should be put in place that do not create a monopoly position for the Single Buyer. For example, even if a Single Buyer has a *de facto* monopoly position at the outset, nothing in the legislation should prevent the entrance of new players, sales by IPPs to non-franchised customers (e.g. large consumers connected directly to transmission), and imports (or exports) carried out by third parties. Whenever practical for larger systems, a central procurement function should be combined with a spot market, whereby electricity trading arrangements allow greater diversity and create price benchmarks, which may serve as a reference to future contracting.<sup>50</sup>

A clear power sector reform vision should be established at the outset, to move the power away from a *de facto* monopolistic buyer towards a scenario where other buyers and sellers are invited and encouraged to participate.

There are several possible ways to create this contestability in the market, including the following:

- In Panama, the Transmission Company, acting as a central agent, was responsible at the outset for administering the procurement of up to 85% of the Distribution Companies’ needs. Anything above this threshold could be contracted directly by the Distribution Company from third parties or alternatively through the administration of the central agent. This obligation of the Distribution Company lasted for a transition period of five years after which the role of the Transmission Company as centralized purchasing arrangement ended;
- In Indonesia, the Single Buyer is designed to be phased out on a regional basis (as opposed to volumetric reductions) as its tariffs become cost reflective and the energy is subsequently traded in a competitive electricity market;
- In Mexico, IPPs are free to export energy to the U.S. Self-generation is also encouraged. Despite its appearance as a Single Buyer, CFE, the state integrated utility, in practice does not operate as such;

- In Brazil, the central agent is only responsible for the coordination of energy procurement for the regulated market (captive consumers). Buyers and sellers in the non-franchised market (eligible customers) may trade energy at unregulated, bilaterally negotiated contracts and are not subject to the procedures of mandated competitive procurement. Brazil’s recent experience with energy procurement is described in Box 15.

**The central purchasing agent should not take ownership for the energy traded, and instead act like a broker, when market conditions permit**

The role of the central agent as the owner of the energy traded should be reduced or completely eliminated over time. Our preference is for a model in which contracts are signed directly between buyers and sellers and the central agent acts as a neutral coordinator of the procurement process – or in other words, an “honest broker.” This has the advantage of mitigating the negative effects of corruption and kickbacks, oftentimes present in large scale, obscure commercial transactions.

Direct contracts require distribution companies to be creditworthy, which may not be the case at the outset for many of the Bank’s client countries. However, it should be part of the vision in establishing a centralized purchasing arrangement.

Some practical alternatives to implement this kind of “hands-off” scheme include:

- In Ukraine, there was a mandatory pool based central agent. This situation avoids many of the problems associated with having an active buyer. The disadvantage of this approach is that it discourages the establishment of long-term contracts, which also serve as important financial hedges. In the absence of those hedges, distribution companies do not have the instruments to manage price volatility and may experience serious financial difficulties, such as the ones observed during the California crisis. Furthermore, it increases credit risks for generation companies, since they will not have a contract with a specific entity which may be taken to court. Hedging contracts of various durations, either physical, financial or a combination of the two, should be an integral part of any sustainable market design.

<sup>50</sup> With the understanding that spot prices are more volatile, as they reflect short-term marginal costs, while long term contracting is meant to reflect long run marginal costs.

### Box 15: Recent Brazilian Experience in Energy Procurement (Auctions)

Until 2003, Distribution Companies in Brazil were allowed to freely negotiate contract terms and conditions with their bulk energy suppliers for the procurement of energy. Self-dealing was permitted up to a certain level of their energy requirements (20%) but derogations had to be established down the road to facilitate the privatization of state owned generators. Distribution Companies had a mandatory requirement to acquire at least 85% of their energy needs in forward contracts with durations of two years or more. The balance could be acquired in short-term contracts or in the spot market. There were also regulatory limits (administrative caps) set on the total costs of energy that Distribution Companies were allowed to pass through to the regulated tariffs of their captive customers, with some incentives for efficient procurement. Those caps were not free from controversy.

After the 2001-2002 energy crisis, when 20% of energy consumption had to be rationed almost on a country-wide basis, the existing procurement system went through a major review. It was acknowledged that it was not conducive to long term contracting, which in turn did not enable generation expansion (oftentimes cited as one of the culprits of the rationing crisis). Furthermore, in a desperate attempt to bring more capacity during the crisis, the former administration was more flexible in terms of allowing self-dealing and increasing the pass-through of generation costs caps to regulated tariffs (VN, or Normative Value in Brazil). Greenfield natural gas fired thermal plants were indeed built but some of those contracts are now stranded creating a burden on customers in some particular concession areas.

In early 2003, a new administration proposed a pure single buyer model as a possible alternative to address those challenges. Additionally, this model would help capture the “economic rent”<sup>51</sup> of depreciated hydro plants, and distribute it evenly to a customer base of about 40 million users. After an analysis of international experiences with single buyer models, the idea was overruled. Instead, the Ministry of Mines and Energy came up with an innovative scheme whereby the Market Administrator (CCEE) would work as “broker.” According to this scheme, distribution companies should prepare their demand forecasts which would be centrally aggregated. All the energy to be acquired by distribution companies had to take place in a competitive manner via an auction mechanism carried out by CCEE in a centralized purchasing arrangement.<sup>52</sup> The arrangement was called a “pool.” Distribution companies were not allowed to enter into new bilateral contracts outside this centralized arrangement except for the existing contracts or PPAs, which were honored.<sup>53</sup> In these auctions each distribution company would buy a “quota” of the energy from the pool. As a result each would sign forward contracts with all the winning generators. An elaborate procurement mechanism based on a simultaneous declining price auction was put in place. The first auction was carried out in December 2004, with the participation of 18 Generation Companies and 35 Distribution Companies. Roughly, 600 bilateral contracts were signed, each Distribution Company with each Generation Company, in a criss-crossed kind of contractual web. 17,000 MW of firm generation capacity were traded, involving about US\$ 28 billion in 8 year contracts for delivery in 2005, 2006 and 2007.<sup>54</sup> Given its sheer size, it was called a “mega-auction.” Contrary to a typical Single Buyer, no government owned special centralized purchasing entity took title for the energy traded, but simply played the role of an honest broker, setting the rules of the game and instructing the market administrator to play the role of the auctioneer. The price paid by distribution companies in the auction is the basis for pass-through of power costs to regulated tariffs of captive customers. Therefore, the mechanism created a more straightforward and transparent way to deal with the thorny issue of setting a normative value for pass through purposes, something that Brazil had struggled for more than 5 years without finding a satisfactory solution.<sup>55</sup>

The auction itself was a success, and proved that this centralized procurement model worked. For some investors, it lacked the desired transparency and to some extent it was a change in the rules of the game, since it no longer allowed privatized generation companies to freely negotiate their energy with distribution companies. The auction was also criticized on the ground of the resulting low prices and loss of market value for large generators, both public and private. It is reasonable to assume that prices reflected supply and demand conditions at that time (Brazil had a capacity glut of 8,500 MW post 2001 rationing) but some investors contend that large state owned generators bid artificially low prices.

### Box 15: Recent Brazilian Experience in Energy Procurement (Auctions), con't.

The real test for the new power sector model will take place for the expansion of new capacity. Initial auction have simply re-contracted generation which was already existent in the market (the so-called old energy). Therefore, they did not entail the building of any additional MW. The success of the new model and the auction process should be measured by the real commitment to build new plants to be made by private investors, both domestic and foreign. A first test carried out in December in 2005 has been successful in terms of attracting investors to build the required new capacity. However, lack of interest from large international players is still a point of concern. Furthermore, it turned out that difficulties in getting environmental licenses in place prior to the auction were underestimated. The jury is still out, and Brazil will have to go through a learning curve as the competitive procurement process is unfolded.

Source: Authors' analysis

- As described in Box 13, no central agency in Brazil is in charge of taking ownership for the energy. The market operator, based on clear guidelines set forth by the government and by the regulator, coordinates the auctions and allocates the energy among distribution companies based on their own load forecasts. Therefore, it ends up being multiple buyer and seller contractual arrangements where the central agent does not take the title for the energy.
- A more elaborate competitive procurement model is observed in the New Jersey in the US. In New Jersey, there is vibrant wholesale competition and also full retail competition. However, not all customers have chosen alternative suppliers. The regulator allows them to stay with the incumbent distribution company. This company, in turn, has the obligation to serve those customers as a supplier of last resort. The regulator put in place an interesting scheme to encourage distribution companies to buy energy effectively. It is based on a central agent arrangement. The model has been considered very successful, has served as a benchmark and has been adopted in other adjoining states in the US. A similar model is now being considered for Italy. Despite the fact that

most developing countries do not have retail competition in place, some of the principles of coordinated procurement process adopted in New Jersey may still be applicable in some developing countries. Box 15 provides more details about the model adopted in New Jersey.

#### **Roles and responsibilities of the central agent should be unbundled to a reasonable extent in order to enable some checks and balances**

A “pure” Single Buyer is a monolithic organization. Most procurement functions are carried out internally, sometimes with minimal regulatory oversight and public scrutiny. Some unbundling is advisable, in terms of who plans the system, determines energy requirements, sets rules for the procurement and monitors results. The practical degree of unbundling depends on the stage of the development of the power sector and the level of maturity of the organizations.

At a minimum, the government or the regulator should establish the rules and procedures for carrying out the functions described in the previous paragraph. An

<sup>51</sup> Studies developed in 1998 proved that there were indeed depreciated power plants in perfect operating conditions – therefore with economic rent. However, there were also plants heavily stranded, whose “accounting cost” was as high as US\$ 270/MWh. On the average, the accounting cost, on a full costing basis, for the entire portfolio of generation plants was about US\$ 36/MWh, or very close to the long run marginal cost of expansion. Therefore, on the average, there was not too much economic rent to be captured.

<sup>52</sup> This concept of pooling has nothing to do with how the power system was (or is) operated on a real time basis. Brazil has always operated its power system as a security constrained, least cost centralized dispatch, run by an independent system operator (ONS). Forward energy contracts have always been financial arrangements (financial hedges), and the new commercial pooling concept did not alter the way the system is physically dispatched.

<sup>53</sup> Or for transaction outside of the regulated environment, where generation companies were allowed to sell their energy to large customers or to marketers – but not to regulated distribution companies.

<sup>54</sup> 17,000 MW contracts of firm generation capacity correspond approximately to 25,000 MW of installed capacity

<sup>55</sup> A discussion about this issue can be found in Arizu, Maurer and Tenenbaum. (2003)

interesting example is in Jordan where the Grid Code<sup>56</sup> not only establishes the central agent procedures for system planning, dispatch and generation expansion, but also assigns to the central agent<sup>57</sup> the right to audit the physical dispatch conducted by the system operator. Currently, both activities are under the same ownership structure. However, functional separation can create a fledgling culture of relative independence with internal checks and balances.

Initially, it may be necessary or desirable to group several functions together under a central agent. However, as a minimum, some functional separation should be planned at the outset, to build more transparency and to pave the road for future unbundling. This is the case in European Union accession countries that are working to comply with EU directives. For instance, when the Turkish Electricity Corporation (TEAS) was restructured in 2001 as part of the power sector

#### Box 16: Mandated Competitive Procurement to Serve Retail Customers

In the United States, the New Jersey regulator has mandated competitive procurement by all distribution companies. New Jersey has full retail competition, whereby every customer has the legal right to buy from an alternate supplier. But even though all customers have the “right to choose,” very few retail customers have actually exercised this right. This then requires that some entity be the “default supplier” or “supplier of last resort” for the energy needs of these customers. In New Jersey the four traditional distribution companies were required to assume this role for the first two years following the introduction of retail competition. However, starting in the third year, the reform law in New Jersey required that the default service (known in New Jersey as the “basic generation service”) be provided through a competitive auction.

There have been several such auctions. One carried out in February 2003 attracted 20 bidders who competed for the right to supply about 18,000 MW of capacity and associated energy with an estimated value of US\$5.2 billion. The auction was conducted over the Internet using a type of auction known as the “clock auction.” This auction involves multiple bidding rounds in which prices tick down until the amount of energy supplied equals the amount of energy sought. Bidders bid for the right to serve tranches that represent 2% of the residential, commercial and industrial loads of each of the four distribution companies for periods of either 10 or 34 months. In the future, it is anticipated that the right to serve one third of the retail load will be subject to competition every year. The winning bidders will assume a one year supply obligation.

The distribution companies do not actually conduct the procurement. The Regulatory Commission hires its own consulting firm to review the design and implementation of the auction. The actual auction process was conducted by NERA, an economic consulting firm, whose services were paid for by the distribution companies. The prices to serve residential and small businesses were close to US\$ 50/MWh. However, these are not final prices to customer. Each of the distribution companies will add on a “distribution margin” to the winning bids for generation service. (More complete information on the New Jersey auction can be found at [www.bgs-auction.com](http://www.bgs-auction.com).)

Contrary to a pure Single Buyer model, in New Jersey the distribution companies do not take title to the power. They are acting as agents for those retail customers taking the default service as opposed to the more traditional role of distribution companies as buyers and resellers of power. The 15 winning bidders bear demand risk—the risk that demand will be greater or smaller than anticipated. Also, distribution companies continue to bear the risk of non-payment.

Self-dealing is allowed. Actually, at least three of the winning bidders were affiliates of the buyer. But there have been no allegations of unfair favoritism towards these bidders. Presumably, this reflects the fact that the actual auction was conducted by a third party and the winners were selected solely on the basis of their willingness to supply at particular prices rather than the more subjective combination of price and non-price criteria, such as auctions conducted in other places in the US (e.g. Florida).

<sup>56</sup> A set of norms and procedures on how, inter alia, the power system should be planned, expanded and operated.

<sup>57</sup> An Unbundled Single Buyer

### Box 16: Mandated Competitive Procurement to Serve Retail Customers, con't.

This kind of competitive auction tied to serving default customers, could also be used in situations where there is no mandatory retail competition. Even in the absence of retail competition, a Regulatory Commission could require that a distribution company conduct an auction to serve some or all of the energy needs of their retail captive customers. Alternatively, the Regulatory Commission could itself set the rules and organize the auction in a centralized fashion.

The New Jersey central purchasing arrangement has been considered very successful in the U.S., among many other attempts to have distribution companies procuring energy in their capacity as providers of last resort. It has recently been adopted by the state of Maryland, and other states are about to adopt the system. As already mentioned, its application goes beyond places where there is full retail competition, and the concept can be used by some developing countries interested in some sort of competitive procurement.

Source: World Bank analysis.

reform process it was separated into three functional companies. Under the current arrangement, the Turkish Electricity Transmission Company (TEIAS) serves also as the system and market operator. The trading functions, on the other hand, are carried out by the Turkish Electricity Trading and Contracting Company (TETAS). Prior to the reform both functions used to be under the purview of TEAS which operated as an Unbundled Single Buyer.

Sector regulation may include rules and codes published and amended through consultation processes with those participating or trading in the industry (participants). Non-discrimination is ensured by the implementation of these rules through an entity (the system operator, the market operator, or the system and market operator if they are combined) that is independent from the generation and trading activity (i.e. is not involved in the business of selling and purchasing electricity).<sup>58</sup> Other mechanisms can increase predictability and transparency, by monitoring and enforcing compliance with the rules and codes. Independent auditing and market surveillance functions of both the system and market operators are also important, to assure compliance, performance and efficiency.

### More flexible contractual arrangements should be utilized

As discussed before, one of the drawbacks of the Single Buyer model is that it relies upon very rigid, capacity based, long term PPAs. Once signed, a serious buyer is committed with 15-20 year energy contracts, bearing most risks for price, market, and exchange rate, among others.

The rationale for this rigidity is well known. Developers, particularly in un-chartered and uncertain territories, want to hedge as much political and market risk as possible. Furthermore, in the absence of a market, any developer faces a monopsony-like situation. In a predominantly seller's market, and in countries oftentimes plagued by chronic shortages, off-takers are seldom in a good position to impose risk allocation schemes fundamentally different from industry norms. However, some flexibility on risk allocation is workable, as long as governments perceive it as desirable.

Moving away from a rigid contractual environment to a new one where competition is fostered entails major changes. The first, possibly the most important step, is to make sure that there is competition "for the market," that is, new energy is procured competitively. The second is how to make sure that all the generation plants in compete "in the market" for dispatch on a day

<sup>58</sup> The issue of concern is that the system operator or the market operator must provide transparent and non discriminatory services, and therefore should not be involved in the commercial interests of those participating in the production, sale or resale of electricity. The role of the market or system operator must be carefully designed in order to prevent their competition with generators in purchasing and reselling ancillary services, including balancing energy.

to day and hourly basis, producing energy at the least possible cost.<sup>59</sup> This feature is referred as “integrating” the PPA into the power market. Reconciling the need to dispatch at minimum cost with honoring contractual obligations is not always an easy task. In general, traditional IPP programs in power sectors without pre-established codes and rules, most of the rights and obligations of the IPP are (or are supposed to be) spelled out in its PPA, which cannot (and should not) be overruled by subsequent market or dispatch rules unless the investor voluntarily agrees to do so.

A fundamental principle is contract sanctity. A contract breach entails a significant reputational risk for the country, discouraging new investors to further participate in the sector. On the other hand, entering into long term, rigid contracts implies a burden for the customer and may impede a smooth transition to a more competitive power sector. There is not a single, perfect solution. Unless there is demonstrable evidence of corruption and contractual malpractices, the underlying assumption is that power contracts are to be honored.

This underscores the importance of having good contracts at the outset. Designing or negotiating contracts is not an easy task. Any amendments have to be mutually agreed among parties. In some cases, such as in Dominican Republic or Indonesia, parties have mutually agreed to reduce the price of the contract. As a *quid pro quo*, the buyer extended the terms of the power agreement. Contract renegotiations, abiding by the principle of sanctity, also took place in Thailand, following a significant devaluation of the local currency. More often than not, contract renegotiation is a tedious, lengthy process. It is worth trying even if chances of success may not be high, unless the contract sets forth severe penalties in case of renegotiation. In the case of termination, the government has to be prepared to pay the necessary compensation for terminating the contract in a manner consistent with its relevant clauses. For such alternative, it is recommended that PPAs include a buy-out clause.

Governments, or centralised purchasing agents acting on their behalf, should make serious efforts to design contracts that are “bankable” and at the same time may be smoothly integrated into the rest of the power sector and its ongoing reform.

The techniques to be used to integrate a PPA into the power market will vary depending on the nature of the contract, the specifics of the power sector or market design, and other important political considerations. Some possible techniques to give more “flexibility” to the PPAs, include:<sup>60</sup>

- Forced market integration
- Forced contract renegotiation
- Market Rules modification
- Voluntary renegotiation
- Virtual Generation/Managed PPA
- Contract buy-out

A detailed discussion on each one of those approaches goes beyond the scope of this paper. Table 5 presents a summary of the main features and key considerations surrounding each one of those approaches.

In summary, there is not a single solution to deal with the problem of integrating existing IPPs into new markets. There is a delicate balance between creating a climate of contract sanctity, conducive to new investments, and at the same time permitting a better integration of energy contracts into the market. Table 6 evaluates those approaches against a common set of criteria.

Some important recommendations deriving from this analysis follow:

- The forced market integration and forced renegotiation approaches have been attempted but are very unlikely to achieve a satisfactory outcome from the point of view of IPPs or consumers;
- The adaptation of market rules, on a transitional or exemption basis could, under some circumstances, prove successful provided that the market can still work efficiently and competitively with respect to other generating plants;
- The virtual/managed PPA approach could be a useful technique provided that there is an incentive to maximize above market costs;
- Voluntary renegotiation stands a much better chance of succeeding than forced negotiation if there is innovative thinking to find mutually beneficial solutions

<sup>59</sup> Equivalent to a least cost, security constrained central dispatch.

<sup>60</sup> This discussion on the design of flexible contracts and on the integration of IPPs is based on “Integrating Independent Power Producers into Emerging Markets”, by Woolf, Fiona and Halpern, Jonathan. World Bank Working Paper, November 2001.

- Contract buyout has the advantage of crystallizing above-market costs at an early stage, but inexperience with the newer market and the likelihood of having to make mid course adjustments to market rules may result in contract bidders demanding a new market risk premium which will magnify the above-market costs.

**Table 5. Options for Integrating PPAs into Wholesale Power Market**

<b>Forced Market Integration</b>	<ul style="list-style-type: none"> <li>• IPPs forced to become market participants, regardless of contract firms.</li> <li>• Alternative tried in Guatemala without success.</li> <li>• Difficult choices for IPPs – wither to accept or to seek damages.</li> <li>• Dangerous option for Governments – may be construed as expropriation, leading to endless litigation and arbitrage.</li> </ul>
<b>Forced Contract Renegotiation</b>	<ul style="list-style-type: none"> <li>• Contracts are changed to become compatible with technical and trading rules.</li> <li>• Forces IPPs to take market risks that were not present before.</li> <li>• Requires immense efforts, but may produce small results</li> <li>• IPPs may be resistant to look for consensus.</li> <li>• Undermines credibility among investors.</li> <li>• May be a costly option for the Government, involving recovery of stranded costs: e.g. Dominican Republic (Madrid Agreement)</li> </ul>
<b>Market Rule Modification</b>	<ul style="list-style-type: none"> <li>• Market rules imply additional obligations (and costs) for the IPPs.</li> <li>• Government may provide exemptions to smaller plants.</li> <li>• However, those exemptions may compromise efficiency.</li> <li>• Possible solution is to include capacity payments in the market.</li> </ul>
<b>Voluntary Renegotiation</b>	<ul style="list-style-type: none"> <li>• To be decided on a case by case basis.</li> <li>• More efficient and may lead to more practical results.</li> <li>• Some very successful cases reported, such as in Pakistan.</li> <li>• Some additional sources of revenues may be given to IPPs, for example, the option to sell ancillary services in the market.</li> <li>• A contract facilitation process may help, if perceived as independent – e.g. Ontario, Thailand.</li> </ul>
<b>Virtual Generation-Managed PPA</b>	<ul style="list-style-type: none"> <li>• Entails designing contract in such a way that IPP is protected if changes occur in market, or transferring the contract to a successor entity, public or private. They become the virtual owners of the generation.</li> <li>• Off-taker, not the IPP, will bear market risk – in IPP perspective, contract is “behind the market”</li> <li>• Successful example in Brazil – IPP had a contract with a generation company which assumed market risks.</li> <li>• This option has the advantage of preserving the contractual rights and minimizing changes in the PPA.</li> </ul>
<b>Contract Buyout</b>	<ul style="list-style-type: none"> <li>• Either the contract holder or third parties may buy the contract when sector restructuring occurs.</li> <li>• There has to be consent from IPP lenders, bondholders and possibly equity investors. Tried in Ontario, without success.</li> <li>• However, appears to be a promising alternative, particularly if buyout conditions are established at the outset.</li> </ul>
	Source: Adapted from Woolf and Halpern (2001)

<sup>61</sup> Fraser. (2005)

**Table 6. Evolution of Options for Integrating PPAs into Markets**

EVALUATION CRITERIA	FORCED MARKET INTEGRATION	FORCED CONTRACT NEGOTIATION	MARKET RULE MODIFICATION	VOLUNTARY RENEGOTIATION	VIRTUAL GENERATION -MANAGED PPA	CONTRACT BUYOUT
May adversely affect credibility of Government	Yes	Yes	No	No, if process is transparent and fair	No	Yes, unless IPP compensation is fair
May deter future investors	Yes	Yes	No	No, if process is transparent and fair	No	Yes, unless IPP compensation is fair
May adversely affect economic position of IPPs reflected in PPA	Yes	Yes	Yes, unless exemptions are granted	No, IPP unlikely to agree to any deterioration	No	Yes, unless IPP is fully compensated
May reduce impact on consumers of above-market cost	Yes	Yes (depends on outcome)	Unlikely	Yes (depends on outcome)	Yes, if an effort is made to reduce above market costs	No, unless buying price offered by third party is discounted to reflect market uncertainties
May adversely affect efficiency or competition in the electricity market	No	No (depends on outcome)	Yes (but it may be transitional)	Maybe (depends on outcome)	No	No

Source: Adapted from Woolf and Halpern (2001)

**There should be a game plan to allow power sector reform to evolve**

A centralized purchasing arrangement (either via single or multiple buyer models) has to be implemented with a clear view on how the power sector should evolve. The first important step is to have flexibility built into the energy contracts, as discussed in the previous section. Another important step is to define the role and intensity of the central purchasing agent, if any, and how this role should be adjusted as power sector reform moves forward.

In principle, it is possible to envision three basic stages of power sector reform, each one resulting in a different role for the central purchasing function.

Initially, in a vertically integrated industry, it is reasonable to assume that the central agent (e.g. a Single Buyer) will play a more active role, possibly being

a de facto sole buyer, signing contracts directly with the sellers. Despite not being desirable, it is probably the only workable solution in distressed power systems, where other buyers such as distribution companies are not minimally creditworthy or are not institutionally established entities.

As the sector evolves and distribution companies are created and/or become more creditworthy, the model may move towards a non-monopolistic centralized purchasing arrangement where distribution companies are allowed to be buyers from IPPs. The Single Buyer may co-exist with other buyers.<sup>62</sup> Over time, some of the original responsibilities of the pure Single Buyer may be phased out. A central purchasing function will still be desirable, to achieve economies of scale and conduct competitive procurement on behalf of the diverse buyers. In more competitive power markets, the central agent may play the role of an energy aggregator and

<sup>62</sup> As we alluded before, it will not be a “single” buyer technically speaking.

procurement coordinator, with no ownership for the energy traded in the market. This has been the case in New Jersey and Brazil. In the former, procurement takes place to serve captive loads acting as the provider of last resort, while in the latter procurement takes place on behalf of local distribution companies.

**Sovereign guarantees should be granted on a selective basis**

The need for guarantees depends on the creditworthiness of the distribution companies, who are in most cases are the off-takers. If distribution companies in the sector are financially viable and present a good credit, sovereign guarantees should not be seen as needed as part of the centralized purchasing arrangement. That is the case in South Africa, where the government made it very clear that given its good financial standing, ESKOM, acting as a Single Buyer, would not receive any form of guarantees for the PPAs to be signed with third parties. The vision is that ESKOM, as a state company, should act on an arm’s length basis, and no contingent liabilities should be imposed upon the government.

When other country experiences are evaluated, some kind of government support seems to be a requisite in sectors where financial viability and sustainability are of concern. More often than not, companies are not creditworthy because tariffs are not cost reflective and/or there is a culture of non-payment for electricity and/or inefficiencies or fraud in the metering, billing and collection cycle.

Investors will seek sovereign guarantees based on their perception of how committed governments are in their endeavors to create a well-functioning and sustainable power sectors. A good indicator of the seriousness of government in pushing the reform agenda and improving efficiencies is to what extent resources are being allocated to the installation of meters, reduction of technical losses, combat on fraud and theft,<sup>63</sup> enforcement on the need for prompt payment of electricity bills, and pass-through of power purchase costs. Investors are very skeptical in

places where electricity is considered a public good that consumers should receive even if they do not pay. The issue of eliminating guarantee requirements is largely in the hands of the government. If investors perceive a dysfunctional power sector, they will require sovereign guarantees as a must. To reduce contingent liabilities ensured by those guarantees, governments have to work hard to treat energy as a commodity, preserve property rights, and put in place the proper tariff and other regulatory mechanisms to create a healthy and self-sustainable power sector. Many of those things cannot be achieved overnight, but a clear direction of change and demonstrable commitment is necessary.

**There needs to be clear, codified rules to assure transparency, accountability and good performance**

The government, and the independent regulator (in countries where such entity is functional), should do their best to put in place rules and procedures, in the entire supply chain, to guarantee that energy is acquired in the most efficient and transparent way.

Procurement rules and guidelines to be followed by the central purchasing agent should be drafted by the Regulator (or the Ministry if it is vested with the regulatory authority), and should also monitor and assure compliance.

“Among the standard rules on procurement which should be covered by the national jurisprudence are the following: open, public competition must be the rule and actual practice for all procurement decisions above a relatively low value threshold; any exceptions should be possible only in truly exceptional circumstances (e.g., natural disasters).”<sup>64</sup>

The Regulator’s role is to strengthen the transparency of the centralized purchasing arrangements. Several possible functions assigned to the Regulator have been identified, as shown in Box 17.

<sup>63</sup> There are two problems associated with this item. One is fraud, by which staff inside the utility offers “services” to consumers not to pay or not be billed. The other is when consumers themselves tamper meters or make their own illegal connections.

<sup>64</sup> Wiehen. World Commission on Dams. (2002)

### Box 17: Regulator's Role in Centralized Purchasing Arrangements

- **Licensing the centralized agent:** When the central purchasing agent is subject to licensing, its obligations can be set in the license conditions regarding different functions, in particular economic procurement and competitive tenders for power procurement. The Regulator then has the role of monitoring and enforcing these conditions.
- **Approval of generation expansion planning.** This is applicable when a central purchasing agent is responsible for the planning function.
- **Issuing guidelines or procedures for competitive procurement by the central purchasing agent.**
- **Approval of standard PPAs and standard tender documents.**
- **Approval of new PPAs, subject to compliance with procurement procedures or guidelines.**
- **Periodic audits of the central purchasing agent's procurement processes, or of the system operation dispatch function, when it is assigned to the central agent or when it is assigned to the system operator.**
- **Introduction of a tariff level and structure that aims at improving efficiency and cost recovery.**
- **Approval of bulk supply tariffs and pass through of the power procurement costs when power is procured competitively, or making sure that the central agent proves that the purchase was economic and at least possible cost.**
- **Formalize distribution companies' tariff methodology to address concerns on pass through and recovery of distribution company purchase costs.**

## 6. CONCLUSIONS AND RECOMMENDATIONS

**Worldwide experience shows that creating a Single Buyer with a monopoly status can be problematic. Such rather rigid energy procurement arrangement should be avoided whenever possible.**

In developing or transition countries, this type of arrangement has been successful in facilitating IPP investments and privatization, but it has been disappointing in many other aspects. It may lead to corruption, discriminatory behavior, excess capacity, high prices, increase in public sector liabilities, and even prevent the future development of a competitive power market.

**If it is the only alternative, then the Single Buyer model needs to be approached with caution. Governments and those who advise them should be aware of its drawbacks, do not view it as a permanent solution and plan a transition to phase out or reduce the wholesale purchasing monopoly as soon as possible.**

If initially, given the small scale or difficult situation faced by a power sector, a multiple buyer/sellers scheme is not workable, some form of centralized purchasing arrangement may be required. Experience has shown that very small, low income countries have indeed relied upon the Single Buyer model when they could not find a workable alternative to attract investment for the generation capacity, badly needed to reduce power shortages and to improve their distressed electricity sectors. In case of lack of creditworthy buyers in the sector, countries have resorted to wholesale power purchases carried out by a central government owned entity, with contracts backed up by sovereign guarantees, in order to attract much-needed new generation investments. There may be legitimate reasons to start with a Single Buyer type of arrangement.

**Countries in distressed situations and facing chronic power shortages should examine rational Demand Side Management (DSM) alternatives.**

Bridging the supply demand gap requires more than expansion of the generation capacity. In many instances, only supply driven alternatives do not suffice or are too expensive (not affordable) to be implemented. Unless energy is used rationally, customers may not have financial resources to cope with the expensive capacity expansion alternatives promoted by the Single Buyer or by other similar kind of arrangement. Experience has shown that promoting more efficient use of energy offers many opportunities that are by far cheaper than increasing traditional or renewable supply sources. In many countries there is a significant potential to be harnessed. This is not to say that DSM will preempt capacity expansion, but it should necessarily be considered part of the equation.<sup>65</sup> In many cases, it may be a better substitute to supply alternatives.

**Centralized purchasing arrangements do not need to have a monopolistic entity responsible for the energy buying and selling in a country.**

A Single Buyer model is a well known form of centralized procurement, which is given a quasi-legal monopoly status over the trading of wholesale electricity in the market. However, there is not a single way to implement it. While designing or deciding a centralized purchasing approach for a power sector, it is important to look at what other countries have done. There is a wide range of possibilities to capture economies of scale, develop expertise, and deal with the issue of non creditworthy buyers. Among the range of possibilities, there are instances where the buyer is not “single” and may be subject to competition with other buyers. In other cases, it is not even a buyer, since it does not take title for the energy traded directly between generators, distribution companies and large customers.

**The broad range of centralized purchasing arrangements may offer the same advantages associated with the single buyer, but allow the much needed flexibility. There is no “one size fits all” approach to a centralized purchasing arrangement. It is crucial that each country takes the specific characteristics of its electricity system into consideration and incorporates its own objectives in power sector reform in order to design a sustainable solution.**

The institutional and commercial mechanisms related to a centralized purchasing arrangement have to be carefully tailored to the specifics of each country. This will enable the country realize its objectives of building a sustainable, efficient electricity sector and at the same time allow the government to play a necessary role in the initial period. There are many ways to set up a centralized purchasing function. Its prime role as a buyer (or agent) involves the decision on how much to buy. It may have to be an active buyer, in the absence of creditworthy institutions, to support generation expansion. It can also be responsible for system operation and market administration in the initial phases of power sector reform. A central procurement entity can be assigned a role of market aggregator, coordinating power procurement, or acting as a buyer of last resort. An important point is that the central agent does not need to take title over the energy to play these roles, unless there are no other ways to have reliable buyers.

**A central purchasing agent should ideally be unbundled from generation and any other activity competing with its trading of energy.**

To make a sector attractive for generation investors, the central procurement agent should not own generation assets, particularly if it is responsible for system operation and market administration. IPPs should be assured that they are not going to be unduly discriminated. The level of unbundling needs to be defined and implemented with a macro vision and blueprint for the power sector reform as a whole.

<sup>65</sup> Maurer, Pereira and Rosenblatt (2005).

**Whenever possible, monopoly rights should not be granted to a central agent as this may be very difficult to eliminate in the future. At the outset, plan the phasing out of the central agent's role as a key energy player, as the power sector evolves.**

Very small, poor countries with distressed power sectors may have to initially rely on a model with a Single Buyer resembling a vertically integrated power sector. However those countries should avoid granting permanent monopoly rights to this buyer, in order to allow the sector to evolve into a more flexible model when possible. One can avoid making the central purchasing agent a pure monopoly (a Single Buyer) by giving customers or distribution utilities the prerogative to buy a growing portion of their energy needs in the market as the sector grows or the market matures, or by implementing the right of a distribution company to procure directly from generators if it can obtain lower prices than the central agent.

**As part of the transition plan to phase out the role and dominance of the central agent, it would be useful to create initial contractual arrangements that give investors a reasonable degree of certainty, but at the same time are flexible enough by including provisions for the healthy evolution of the power sector.**

To avoid a straightjacket, the contractual arrangements between the central agent and the buyers and sellers, have also to be flexible, include buy out and transferability conditions, and provisions regarding any temporary role of the central agent that will disappear later. It is understandable that developers and their financiers would rather have long term, risk-free PPAs for the entire duration of the asset pay-back period. However, these arrangements can include special provisions that add flexibility and avoid the self-perpetuation of the central agent, and, in particular, avoid creating barriers or stranded costs that prevent a country from moving towards a more competitive or multi buyer market in the future. The interests of the investors and those of the consumers need to be balanced. There is no magic solution, but experience has shown that it is possible to find a compromise. Some of the alternatives include - shorter term contracts, particularly for existing generation (as opposed to green field), buy-out clauses, and a gradual decline in distribution companies' obligation to acquire energy from the central agent.

**In order to avoid many of the problems associated with the integrated or unbundled Single Buyer model, one must make sure that all energy is procured competitively, in a transparent process, while maintaining the sanctity of existing contracts. Direct one to one negotiation with unsolicited projects should not be acceptable. There are many success stories in energy auctions or competitive tenders for new generation.**

A transparent and competitive procurement process is perhaps the most important aspect to be taken into account, at any phase of power sector reform, no matter how small or distressed a system is. Many problems related to corruption (or perception thereof), oversupply, nepotism, contract disputes and arbitration, and high energy prices derive from unsolicited offers, side deals, and the lack of a sound least-cost system expansion planning process, codified in the regulatory framework. Competitive processes for energy procurement, such as energy auctions for existing and new energy, are becoming increasingly popular and promising.

**Centralized purchasing arrangements also make sense as part of the second generation reform process.**

Centralized purchasing arrangements are not only relevant in developing country, small power sectors, where procurement skills, lumpiness of investment, and lack of credit worthiness of distribution companies are real causes of concern. Its value has also been acknowledged in second generation power sector reforms in developed competitive electricity markets, whereby the purchaser acts like a broker or coordinator of a transparent competitive procurement process.

**Like the Single Buyer model, other centralized purchasing arrangements can indeed help expand generation capacity and improve reliability of supply. However, purchasing arrangement should not be blindly amended just for the sake of expanding capacity. A power sector has to be sustainable, and the ultimate goals should be, in countries with low electrification, to increase access, and in all countries to provide an affordable and reliable electricity service to consumers.**

Expanding generation capacity via a Single Buyer or other centralized purchasing arrangements should not be perceived as an end in itself. Experience has underscored the importance of building an ultimately sustainable energy sector, where tariffs are adequate, energy is used efficiently and smartly targeted subsidies are implemented whenever needed. Examples abound where countries were indeed able to attract sufficient generation capacity but at high costs, excess supply needs, and therefore consumers were not able to pay for the energy produced. In such instances, little or no improvement in access or service quality was noticed, despite the changes in the institutional procurement mechanisms and availability of power. Examples also exist of countries with low electrification where a Single Buyer model was implemented but energy access has not increased. A Single Buyer model or any other centralized purchasing arrangement should not view capacity expansion an end unto itself, but as part of a broader program to help the poor and make energy more affordable and reliable. In that sense, the track record of Single Buyers in serving the poor is relatively modest. Little correlation was established between capacity expanded via Single Buyers and a significant increase in energy access.

## REFERENCES

- Arizu, Beatriz, William Dunn, and Bernard Tenenbaum. 2002. *Transmission System Operators. Lessons from the Frontline*. Energy and Mining Sector Board Discussion Paper Series, Paper No. 4. Washington, D.C.: World Bank.
- Arizu, Beatriz, Luiz Maurer, and Bernard Tenenbaum. 2004. *Pass Through of Power Purchase Costs*, Energy and Mining Sector Board Discussion Paper Series, Paper No.10. Washington, D.C.: World Bank.
- Bakovic, Tonci, Bernard Tenenbaum, and Fiona Woolf. 2003. *Regulation by Contract*. Energy and Mining Sector Board Discussion Paper Series. Washington, D.C.: World Bank.
- Barker, James, Luiz Maurer, and Tjaarda Storm van Leeuwen. 2003. *The Evolution of the Single Buyer Model and Introduction of Competition*. Washington, D.C.: World Bank. (Unpublished)
- Bacon, Robert and John Besant-Jones. 2002. *Global Electric Power Reform, Privatization and Liberalization of the Electric Power Industry in Developing Countries*, Energy and Mining Sector Board Discussion Paper No.2. Washington, D.C.: World Bank.
- Becker, João and Luiz Maurer. 1990. *Plan 2010 Ignores Variations in the Cost of Capital*, *Gazeta Mercantil*, Brazil.
- Bosshard, Peter. 2002. *Private Gain - Public Risk? The International Experience with Power Purchase Agreements of Private Power Projects*, International Rivers Network.
- Fraser, Julia. 2005. *Lessons from the Independent Power Experience in Pakistan*. Energy and Mining Sector Board Discussion Paper No. 14. Washington, D.C.: World Bank.
- Henisz, Witold and Bennet Zelner. 2001. *The Political Economy of Private Electricity Provision in Southeast Asia*, Reginald H. Jones Center Working Paper, the Wharton School University of Pennsylvania and McDonough School of Business Georgetown University, WP 2001-02.
- Lovei, Laszlo. 2000. *The Single Buyer Model*. Viewpoint. No. 255. Washington, D.C.: World Bank.
- Maurer Luiz, Mario Pereira, and Jose Rosenblatt. 2005. *Implementing Power Rationing in a Sensible Way*. ESMAP Series, No. 305-2005. Washington, D.C.: World Bank.
- Maurer, Luiz and Tjaarda Storm van Leeuwen. 2003. *Issues to Consider: Flexibility of the Single Buyer Model*. Riyadh. (Draft for Discussion)
- Petrov, Konstantin, Paul Giesbertz, Tjaarda Storm van Leeuwen, and Rene Mendonça. 2003. *Market and Industry Design in the Power Industry: Application for the Maghreb Countries*. Washington, D.C.: World Bank. (Unpublished Draft)
- Petrov, Konstantin, Paul Giesbertz, and Annelies Huygen. 2002. *Electricity Generation Activity reform in Tunisia*, KEMA Consulting.
- Parikh, Kirit. 2002. *Thinking Through the Enron Issue*. *Economic and Political Weekly*, XXXVI (17): Pages 1463-14-72. Volume XXXVI, Number 17.
- Rimban, Luz and Sheila Samonte-Pesayco. 2002. *Trail of Power Mess Leads to Ramos*. The Philippine Center for Investigation.
- Salant, David. 2003. *On the Role of the Single Buyer: Acquirente Unico*. NERA.
- Sweeney, James L. 2002. *The California Electricity Crisis*. Hoover Institution Press Publication No. 513, Stanford, CA.
- Wiehen, Michael. 2002. *Transparency and Corruption on Building Large Dams*, World Commission on Dams, Thematic Review V.4. Transparency International, Germany.
- Woolf, Fiona and Jonathan Halpern. 2001. *Integrating Independent Power Producers into Emerging Wholesale Power Market*, Washington, D.C.: World Bank.





THE WORLD BANK  
GROUP



The Energy and  
Mining Sector Board

The World Bank  
1818 H Street N.W.  
Washington, D.C. 20433  
USA