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**REPORT AND RECOMMENDATION
OF THE PRESIDENT
OF THE
INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT
TO THE
EXECUTIVE DIRECTORS
ON A
PROPOSED ENERGY SECTOR REFORM LOAN
IN THE AMOUNT OF US\$454.55 MILLION
TO THE
FEDERATIVE REPUBLIC OF BRAZIL**

May 17, 2002

**Finance, Private Sector and Infrastructure Sector Management Unit
Brazil Country Management Unit
Latin America and the Caribbean Region**

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CURRENCY EQUIVALENTS
Currency Unit=Brazilian Real (R\$)

EXCHANGE RATE
(Exchange Rate Effective May 13, 2002)
R\$1.00=US\$0.40
US\$1.00=R\$2.50

WEIGHTS AND MEASURES
Metric System

FISCAL YEAR
January 1st to December 31st

ABBREVIATIONS AND ACRONYMS

ANA	Agência Nacional de Água	Federal Water Regulatory Agency
ANEEL	Agência Nacional de Energia Elétrica	Federal Electricity Regulatory Agency
ANP	Agência Nacional do Petróleo	Federal Hydrocarbons Regulatory Agency
BNDES	Banco Nacional de Desenvolvimento Econômico e Social	National Social and Economic Development Bank
BOVESPA	Bolsa de Valores de São Paulo	São Paulo Stock Exchange
CADE	Conselho Administrativo de Defesa Econômica	Anti-Trust Agency
CCC	Conta de Consumo de Combustíveis	Fuel Compensation Account
CCPE	Comitê Coordenador do Planejamento da Expansão do Sistema Elétrico	Power System Expansion Coordinating Committee
CNEN	Conselho Nacional de Energia Nuclear	National Nuclear Energy Council
CNPE	Conselho Nacional de Política Energética	National Energy Policy Council
CNRH	Conselho Nacional de Recursos Hídricos	National Water Resources Council
DNAEE	Departamento Nacional de Águas e Energia Elétrica	National Department for Water and Electricity
EIA	Environmental Impact Assessment	
ESCO	Energy Service Company	
ESMAP	Energy Sector Management Assistance Programme	
ESRL	Energy Sector Reform Loan	
ESTAL	Energy Sector Reform Technical Assistance Loan	
FDI	Foreign Direct Investment	
GCE	Câmara de Gestão da Crise de Energia Elétrica	Energy Crisis Management Chamber
GDP	Gross Domestic Product	
IDB	Inter-American Development Bank	
IBAMA	Instituto Brasileiro do Meio Ambiente	Brazilian Environmental Institute
IBGE	Instituto Brasileiro de Geografia e Estatística	Brazilian Institute of Geography and Statistics
MAE	Mercado Atacadista de Energia	Wholesale Electricity Market
MAG	Ministério de Agricultura	Ministry of Agriculture
MMA	Ministério do Meio Ambiente e dos Recursos Renováveis	Ministry of the Environment and Renewable Resources
MME	Ministério de Minas e Energia	Ministry of Mines and Energy
ONS	Operador Nacional do Sistema	National System Operator
PPIAF	Public-Private Infrastructure Advisory Facility	
PRODEEM	Programa de Desenvolvimento Energético de Estados e Municípios	State and Municipal Energy Development Program
PSBR	Public Sector Borrowing Requirement	
RGR	Reserva Global de Reversão	Global Fund for Reversion of Power Sector Asset Ownership
SEA	Strategic Environmental Assessment	
SELIC	Sistema Especial de Liquidação e Custódia para Títulos Federais	Brazilian average daily inter-bank lending rate
UNDP	United Nations Development Programme	

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Brazil FOR OFFICIAL USE ONLY
Energy Sector Reform Loan

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BRAZIL
ENERGY SECTOR REFORM LOAN
LOAN AND PROGRAM SUMMARY

Borrower	Federative Republic of Brazil
Implementing Agency	Ministry of Mines and Energy
Poverty Category	Not applicable.
Amount	US\$454.55 million.
Terms	Bullet payment on June 1 st 2012; interest at six-month LIBOR plus fixed spread for Fixed Spread Loans denominated in USD.
Commitment Charge	0.85% p.a. on undisbursed loan balances for first four years, standard charge of 0.75% p.a. on undisbursed loan balances thereafter, beginning 60 days after signing, less any waiver.
Front-end Fee	1% of Loan amount, capitalized.
Objectives	The objectives of the operation are to support the Government's efforts to: (a) restore the normal functioning of the power sector following the recent energy supply crisis; and (b) address the immediate regulatory problems that were the underlying cause of the crisis.
Description	<p>The proposed operation would support key reform measures in the following broad areas:</p> <ul style="list-style-type: none">• The Government's effective management of the energy crisis, which served to avoid rolling blackouts and minimized the economic and social cost of supply shortages.• A series of regulatory reforms which have brought electricity tariffs up to cost recovery levels and allowed them to adjust over time as required. This will help to restore incentives for private sector investment in the sector.• A series of market reforms that will improve the competitiveness of the wholesale power and gas supply markets, and remove impediments to private sector investment.• Improvements in the timeliness and consistency of application of what is basically a sound framework for environmental regulation in Brazil.

- Improvements in **access** to electricity by low income rural consumers, and modification of tariff policies to ensure the **affordability** of electricity tariffs for low income urban consumers.

Benefits

The operation provides benefits in three key areas. First, it would enhance economic growth prospects for the country as a whole by rectifying the problems that continue to afflict the power sector. Second, it would address the specific needs of the poor by promoting universal access to an affordable electricity service. Third, it would address issues of longer term sustainability, natural resource use, and management of the environmental and social impacts of power sector expansion.

Risks

Two significant elements of risk have been identified. The first is that the key regulatory and policy making institutions in the sector lack the capacity to implement the program. The second is that the new administration that will take office in January 2003 may not share the same long-term vision of the energy sector. Both of these risks may be reduced through the parallel Energy Sector Reform Technical Assistance Loan (ESTAL), which incorporates institutional strengthening measures and aims to provide a vehicle for continuing dialogue with the new administration.

Financing Plan

Not applicable.

Net Present Value

Not applicable.

**Project Identification
Number**

PE-P076905-LEN-BB

EXECUTIVE SUMMARY

- 1. This Report proposes an Energy Sector Reform Loan (ESRL) to the Federative Republic of Brazil in the amount of US\$454.55 million (including front-end fee of 1%).** The operation will initiate a medium- term program of Bank assistance to the energy sector, designed to support the completion of reforms started in 1995 and subsequently stalled due to some opposition and an energy supply crisis. The Government remains committed to achieving the model envisioned in 1995; that is, an energy sector characterized by competition, private sector operation and investment, public oversight through policy making and regulation, and universal coverage. The program of assistance to the energy sector will start by focusing on the power sector, where there are more urgent reform needs and greater consensus on the reform agenda. The hydrocarbons sector is covered directly only with respect to provision of natural gas for electricity generation, although certain other components, such as institutional strengthening, would affect the energy sector as a whole.
- 2. During 2001 Brazil experienced a major electricity supply crisis.** This was caused by one of the worst droughts on record, which affected vast areas of the country, failing to refill the large hydroelectric reservoirs on which the country depends. Power supplies were disrupted causing serious economic and social hardship, particularly in the poorest, Northeast region. In 2002 precipitation returned to normal and the reservoirs are recuperating. The crisis brought to light serious limitations in the organization of the power system as a whole.
- 3. The Government showed considerable skill in managing the power crisis and identifying its underlying causes.** While the recent drought has undoubtedly played an important role in provoking the crisis situation, the fundamental causes of the problem lie elsewhere. The crisis can ultimately be traced to a series of regulatory deficiencies and pricing distortions created during the early phase of the transition to the new power sector model (1995-2000). The Government managed the crisis successfully, avoiding the need for rolling blackouts and minimizing the social and economic impacts of rationing. Moreover, once the crisis was brought under control, the Government turned its attention to addressing the underlying regulatory failures that were the cause of the problem, and realizing the original long-term vision for the sector.
- 4. The proposed operation will contribute to achieving the new sector model by pursuing interlocking sectoral and macroeconomic objectives.** The financing provided by the ESRL is not earmarked to the power sector, but will go directly to the Ministry of Finance in the form of general budgetary support. Hence, at the macroeconomic level, the operation will contribute to financing Brazil's nominal public sector deficit and its US\$47 billion gross external financing requirements. About US\$5 billion of this total is expected to be met from public sector sources, including multilateral disbursements such as the proposed ESRL. In the longer term, the sectoral and macroeconomic objectives of the proposed operation will interlock, since the policy reforms to be undertaken in the energy sector will help to promote economic growth, and thereby ease the external financing requirement.

5. **The proposed operation is an important part of Brazil's poverty reduction strategy, as supported by the CAS (discussed by the Board on 03/30/2000. Progress Report discussed on 05/24/2001).** The strategy considers the broad renewal of growth, based on macroeconomic stability and fiscal adjustment, to be essential for large and sustainable poverty reduction.¹ The proposed operation will contribute to poverty reduction through two independent channels:

- By restoring the energy sector to a sound footing, the operation will remove one of the key domestic constraints to economic growth in Brazil. It is estimated that the energy crisis reduced GDP growth in 2001 by about one percentage point. Recent estimates suggest that in Brazil, each percentage point of economic growth lifts 300,000 people out of poverty.
- By addressing the deficiencies in the current regulatory framework for low-income urban tariffs and rural electrification, the operation will ensure that both urban and rural poor have access to affordable electricity service.

6. **The operation has no negative environmental or social impacts, and supports the development of a strategy for strengthening the planning and management of environmental and social issues in the power sector.** The development of the strategy will entail the following activities: (a) a review of environmental licensing requirements, procedures, and mandates for power sector projects; (b) a clarification of institutional roles and procedures for medium to long-term planning and improved coordination with water resources management and environmental agencies; and (c) an assessment of environmental and social issues associated with alternative medium to long-term system expansion paths.

Objectives and Basic Coverage of the Government's Reform Program

7. **Brazil embarked upon a major energy sector reform process in 1995.** The Brazilian power sector is unique in that hydroelectric power represents 90 percent of its generation portfolio. Generation and transmission activities in Brazil were historically the responsibility of the federal company Eletrobras, while distribution was largely undertaken by state utilities. In 1995, a sector reform process initiated the vertical unbundling and privatization of the sector. Due to political resistance, the unbundling process was never completed, so that 58 percent of national generating capacity remains in the hands of vertically integrated Eletrobras subsidiaries. However, 23 percent of generation assets and 64 percent of distribution were successfully privatized. As part of the reform process, the Government introduced an independent system operator (ONS) to be responsible for central cost-based dispatch, and a new regulatory agency (Federal Electricity Regulatory Agency - ANEEL) to supervise the sector. Parallel reforms in the upstream gas market ended the legal monopoly of Petrobras, but in the absence of any structural reforms, competition has been very slow to develop.

¹ Brazil's poverty reduction strategy also includes continuation of reforms to improve basic education and health, public services, land titling, support to small farmers, and the social safety net. In addition, it aims to increase social inclusion by promoting the participation of poor and marginal citizens in poverty reduction projects.

8. **Against this background, the Government has requested World Bank support for a long-term energy sector program, with the ultimate objective of realizing the Government's original vision for the sector.** The Government's long-term objective is to create an energy sector that provides universal access to reliable, sustainable and efficient energy services. As articulated in the Letter of Development Policy (Annex 1), the Government believes that the only realistic way to achieve this objective is by opening up the energy sector (including power generation and upstream gas supply) to effective competition, and promoting private sector participation in the operation of the existing infrastructure and the development of new capacity. To function effectively, such a sector needs to be supported by effective Government institutions. In particular, it requires: (i) a well-resourced and expert body to provide strategic policy guidance; (ii) an autonomous regulatory agency that makes transparent, consistent, and defensible decisions, and can be held accountable for them; (iii) an impartial system operator to ensure the efficient utilization of generating capacity; (iv) an efficient pricing system that signals true economic costs and adjusts transparently to changes in costs over time; and (v) a set of modern regulatory instruments such as accounting systems, financial models, benchmarking databases, and systems for monitoring the quality of service and responding to customer complaints.

9. **The Government has already made rapid progress towards redressing the underlying causes of the crisis and moving further towards the long-term vision of the sector.** In January 2002 the Energy Crisis Management Chamber (GCE) mandated the adoption of a comprehensive and well-designed 33-point action plan of regulatory and structural reforms. In April 2002 Congress passed a new law (Law 10438/02) which implements a number of the most important reform measures, including tariff increases, tariff rebalancing, the establishment of binding targets for rural electrification, and renewable energy promotion. The rapid progress that has been made during the last 12 months, together with the significance of these recent measures, demonstrates the extent of the Government's commitment to the energy reform program.

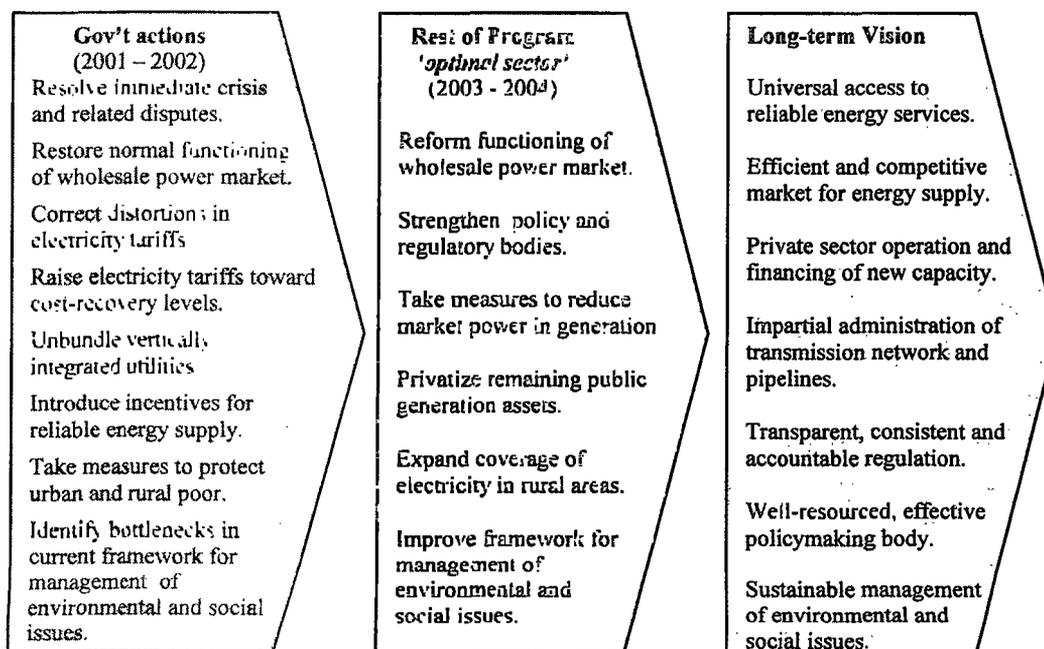
Timing and Sequencing of the Operation

10. **The World Bank proposes to support the Government's efforts to achieve its long-term vision with a series of operations and a variety of instruments.** Given that the original sector reforms were supported by a World Bank operation (Loan 3376-BR), continued Bank involvement in following through the reform process is particularly important. The new interventions will take the form of a program, comprising the proposed single tranche ESRL, a proposed Energy Sector Reform Technical Assistance Loan (ESTAL), and a Public-Private Infrastructure Advisory Facility (PPIAF) Grant. The underlying continuity for the program will be provided by the proposed ESTAL. Whereas the adjustment operations will take the form of general budget support, the technical assistance and PPIAF operations will channel resources directly to those policymaking and regulatory institutions responsible for implementing the policy reforms. Further operations may be proposed as necessary. The scope of the proposed interventions and how they relate to one another is illustrated in the following table:

Bank Support to the Brazilian Energy Sector		
ESRL	PPIAF	ESTAL
June 2001-May 2002	May 2002-December 2002	August 2002-December 2006
<p>Implementation of first-level reforms in:</p> <ul style="list-style-type: none"> • Market development and regulation • Environmental management • Access for the poor • Long-term planning • Institutional strengthening 	<p>Studies for second-level reforms in:</p> <ul style="list-style-type: none"> ◦ Market development and regulation ◦ Access for the poor <p>Workshops with stakeholders to:</p> <ul style="list-style-type: none"> • Discuss results of studies • Draw lessons from international experience • Build consensus 	<p>Implementation of second-level reforms in:</p> <ul style="list-style-type: none"> ◦ Market development and regulation ◦ Environmental management • Access for the poor ◦ Long-term planning ◦ Institutional strengthening

11. The ESRL is designed primarily to support the Government in its effective management of the power crisis, the undertaking of the necessary groundwork for the next set of structural reforms, and the implementation of first level reforms. The next set of structural reforms would be implemented with support from the PPIAF, the ESTAL and possibly further lending, thereby enabling the full realization of the original power sector reforms (see figure below). Despite the possibility of succeeding operations, the ESRL was not structured as a programmatic loan because of the Presidential elections in October 2002; it would be inappropriate for the current administration to make commitments on behalf of the future Government. The policy dialogue on remaining necessary structural reforms will be resumed with the new administration.

Overview of Brazil's Energy Sector Program



Description of Achievements

12. **Actions undertaken and under implementation by the Government can be grouped into seven main areas** (see Annex 2 for further details):

- **Effective Management of the Energy Crisis.** Measures taken by Government include: (i) the timely implementation of a rationing program tailored to minimize social and economic impacts; (ii) contracting emergency supplies; and (iii) resolving financial disputes and reducing the backlog of wholesale market transactions resulting from the crisis.
- **Market Reform.** The success of the reformed power sector model will depend on establishing efficient wholesale energy markets, for both electricity and gas (the critical input for thermal generation). A crucial first step consisted of measures to normalize and improve the electricity wholesale market, strengthen competition in gas supply, and correct problems with the governance of the system operator. Complementary measures have been mandated to reduce the market power of large vertically integrated federal utilities by selling off their power supplies via public auctions and introducing legal separation of generation and transmission.
- **Regulatory Reform.** A series of tariff reforms which have been mandated by GCE and which were designed to remove the distortions that currently discourage private sector investment are at the core of the proposed operation. In particular, generation and distribution tariffs have reached cost-recovery levels, and regulatory reforms are underway to ensure that they remain at cost-recovery levels over time. Equally important, the operation will support the introduction of incentives to ensure that distributors provide reliable energy supplies to their customers.
- **Environmental and Social Issues.** Although Brazil has a sound framework for environmental regulation, a number of shortcomings in the institutional framework often prevent its timely and consistent application, creating a potential impediment to private investment in the sector. The ESRL program and the parallel ESTAL would support a series of proposed interventions designed to address these and other concerns related to the mainstreaming of environmental and social issues in the early stages of the expansion planning cycle.
- **Protection of the Poor.** One of the shortcomings of the earlier sector reform process was that it gave distribution concessionaires complete discretion to determine low-income urban tariff discounts and rural electrification plans, without establishing any corresponding responsibilities or guidelines. The Government has addressed both of these problems. The introduction of a consistent set of principles and eligibility rules for low-income tariff discounts will protect poor consumers in urban areas. At the same time, the definition of a coherent strategy for rural electrification, with clear targets for each operator, will contribute to extend service to the rural poor within (depending on the region) a two to ten-year period.
- **Energy Efficiency and Renewable Energy.** The Government has promulgated regulations containing energy efficiency standards for a wide range of standard

electrical equipment. This measure forms part of a wider program aiming to save at least 1 percent of electricity demand each year, thereby postponing US\$300 million of investments in generation capacity each year. Measures have also been taken to promote the use of renewable energy sources (mainly small hydro, wind, and biomass).

- **Institutional Reform.** The incomplete implementation of the original reform model left a variety of structural problems, both within the sector itself and among the government institutions that oversee it. The Government is addressing the issues, beginning with a major reorganization of the Ministry of Mines and Energy.

Environmental Issues

13. **The project has no direct or indirect adverse environmental or social impacts, since it focuses on legal, regulatory and institutional reforms.** Moreover, being an adjustment operation, the project provides general budgetary support as opposed to financing specific power sector investments. Proceeds of the loan are integrated into the reserves of the Central Bank. The loan is not used for investments or other budgetary expenditures in the power sector or any other sector. Furthermore there are no indirect impacts on the power sector's budget as a result of possible fungibility of resources across public sector budgets. A C rating has therefore been accorded.

14. **The ESRL and the parallel ESTAL offer an opportunity to strengthen the general framework both for management of environmental and social issues in the power sector and for environmental licensing of power sector projects in Brazil.** The general framework for managing environmental and social issues in the power sector, and for environmental licensing of power sector projects has been in place since 1986 and is comprehensive, detailed and basically sound. Nonetheless, as a result of the ongoing sector reform, regulatory, institutional, and methodological concerns have arisen. These include certain inefficiencies of the current licensing system, the overlapping mandates of different agencies, and the need to update methodologies and procedures to assess environmental and social implications in power sector expansion in line with increased attention to optimal, integrated natural resource use. A proactive, strategic approach is being taken, through the preparation of a series of studies and the design of a program to address priority issues.

15. **The adjustment program focuses on revisiting and updating as needed the overall framework of environmental regulation and management as the basis to ensure effective environmental procedures in managing specific power projects and the sustainability of future sector expansion.** The two operations (ESRL and ESTAL) complement each other in supporting preparation of a program comprising the following key elements: (i) a review of environmental licensing requirements, procedures, and mandates for power sector projects; (ii) a clarification of institutional roles and procedures for medium-long-term planning and improved coordination with water resources management and environmental agencies; (iii) carrying out a set of studies on priority topics including: project preparation methodologies; strategic assessment of longer-term system expansion paths; river basin inventories; strategic assessment of the thermal power program; issues and options

relating to climate change; promotion of corporate responsibility; and (iv) support for the institutional realignment and strengthening of professional cadres within the power and environment sectors. While the first two activities are of relevance in the very short-term, the last set of activities addresses issues related to the future efficiency of the sector.

Risks and Sustainability

16. While the measures supported by the current operation have already been completed, some concerns persist regarding the longer term sustainability of these reforms and the broader energy reform program initiated by the proposed operation.

- **The policy-making and regulatory institutions that will be responsible for following through the reform progress are still relatively weak.** The institution that has so effectively spearheaded the response to the energy crisis and the wider revitalization of the sector, the GCE, is temporary in nature and will be dissolved at the end of 2002. The GCE was created as an ad hoc body in response to the perceived weaknesses of the existing policy-making (MME) and regulatory (ANEEL) institutions of the sector. However, it is these institutions that will ultimately be responsible for following-through the reform program developed by the GCE. This risk has been addressed by incorporating substantial institutional strengthening components into the ESTAL that forms an integral part of the proposed program of Bank assistance.
- **The next Government may not share the same long-term vision for the power sector.** With the upcoming elections in October 2002, it is possible that the new administration may take a different view about the long-term model to be followed for the energy sector. While this risk cannot be entirely contained, at present there is at least cross-party consensus about the need for a competent and independent energy regulator and on the need to increase private sector participation in the expansion of the power sector. However, while falling short of their full potential, the reforms supported by this loan would nonetheless have made an important contribution to sector improvement even if the next Government decides not to pursue some of the envisaged medium-to long-term reforms. Once again, the ESTAL provides a vehicle for dialogue with the new administration and will help to provide the underlying continuity for the program.

**REPORT AND RECOMMENDATION OF THE PRESIDENT OF THE
INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT TO
THE EXECUTIVE DIRECTORS ON A PROPOSED
ENERGY SECTOR REFORM LOAN TO THE
FEDERATIVE REPUBLIC OF BRAZIL**

I. INTRODUCTION

1. **This Report proposes an Energy Sector Reform Loan (ESRL) to the Federative Republic of Brazil in an amount of US\$454.55 million (including a front-end fee of 1%).** The operation will maintain Bank support for power sector reform (Loan 3376-BR) and will initiate a medium-term program of Bank assistance to the energy sector in Brazil, which started in 1995 but were subsequently paralyzed as a result of political tensions and an energy supply crisis. The Government remains committed to its original vision of a competitive energy sector, where operating and investment decisions are undertaken by the private sector, and public oversight is exercised through an effective regulatory framework. However, as a result of the obstacles encountered along the way, Brazil currently finds itself stuck in an awkward intermediate position between a centralized state-controlled industry and a privatized competitive market.

2. **The proposed ESRL will contribute to the achievement of inter-locking sectoral and macroeconomic objectives.** The finance provided by the ESRL is not earmarked to the power sector, but will provide general budgetary support and enter the countries' foreign exchange reserves. Hence, at the macroeconomic level, the operation will contribute to financing the nominal public sector deficit and the US\$47 billion gross external financing requirements of 2002. About US\$5 billion of this total is expected to be met from public sector sources including multilateral disbursements, such as the proposed ESRL. In the longer term, the sectoral and macroeconomic objectives of the proposed operation interlock, since the policy reforms to be undertaken in the energy sector will help to promote economic growth thereby easing external financing requirements.

3. **The proposed ESRL could be complemented by subsequent operations to optimize the power sector model.** One or more follow-up operations could focus on optimizing the sector model by addressing underlying structural problems. This would entail completing the vertical and horizontal break-up of electric utilities so as to provide the basis for effective competition, and perfecting the wider policy-making and regulatory framework. This program of support would include, but not be limited to a new Technical Assistance operation, expected to become effective toward the end of the proposed operation, thereby providing underlying continuity to the policy dialogue and following through with the implementation of the reform program.

4. **This Report sets out the detailed case for the proposed ESRL and lays down the associated conditions.** The discussion is organized as follows. Section II explains how the operation would contribute to the World Bank's poverty reduction agenda in Brazil, both from a macroeconomic and microeconomic perspective. Section III describes the wider macroeconomic context in Brazil. Section IV provides some background on the Brazilian

energy sector, the reform process and the advent of the current energy crisis. Section V describes the proposed lending program in some detail. The Letter of Sector Development Policy may be found in Annex 1, the Policy Matrix in Annex 2, additional background material on the energy sector is provided in Annex 3, Annex 4 provides a detailed description of the framework for environmental regulation, and Annexes 5, 6 and 7 are the state of the active IBRD and IFC portfolio in Brazil and the country at a glance.

II. LINKS TO POVERTY REDUCTION

5. **The proposed operation is an important part of the Brazil CAS poverty reduction strategy (discussed by the Board on 03/30/2000. Progress Report discussed on 05/24/2001).** This strategy considers renewal of broad-based growth, based on macroeconomic stability and fiscal adjustment, necessary for large and sustainable poverty reduction. Important improvements in the assets of the poor would include continuation of reforms for better basic education and health, public services, land reform and support to small farmers. Social protection would be further improved through strengthening and better targeting of the social safety net. Finally, participatory policies would increase social inclusion and effectiveness of poverty reduction projects.

6. **The poverty reduction impact of the operation comes through two independent channels.** The first channel is a macroeconomic one. By restoring the equilibrium of the energy sector, the operation will remove one of the key domestic constraints holding back economic growth in Brazil; a key determinant of poverty. The second channel is a microeconomic one. By addressing the deficiencies in the current regulatory framework for low income urban tariffs and rural electrification, the operation will promote access by both urban and rural poor to an affordable electricity service.

A. Macroeconomic Linkages

7. **A well-functioning energy sector is an important precondition for economic growth, as attested by recent evidence from Brazil.** Recent evidence on determinants of growth in the poorest northeastern region of Brazil found a strong link from investments in water and energy infrastructure to increased private capital formation and output, since a 10% decrease in infrastructure investment leads to a 2% to 3% decrease in private capital formation. The implication is that a poorly performing energy sector will raise the cost of doing business and retard economic growth.

8. **The macroeconomic impacts of energy rationing have been substantial; initial estimates suggest that it has reduced GDP growth by about 1 percentage point.** This estimate does not take into account the longer-term growth impact of the crisis, which has created additional investment uncertainty and dampened medium-term expectations.

9. **About 300,000 people will fail to escape from poverty as a result of the energy crisis, and 35 million poor will see their living standards worsen.** At present, 23% of the Brazilian population, equivalent to 35 million people, lives in extreme poverty, surviving on less than R\$65 per month (or US\$0.80 per day at the current market exchange rate). The growth impact of the current energy crisis is expected to prevent about 300,000 people from

escaping poverty this year, as well as preventing those still below the poverty line from improving their living conditions.

10. **The situation is particularly acute in the Northeast of the country, which is by far the poorest region and also the worst affected by the energy crisis.** The nine states of the Northeast are home to almost two thirds of poor people in Brazil. They have an average poverty rate of 48%, which is more than twice the national average, and per capita GDP has lagged behind at 60% of the national average since as long ago as 1960. The Northeast has been particularly hard hit by the energy crisis. Since 1998, the region has been experiencing its worst drought in 70 years, and rainfall levels in 2001 were less than 20% of the corresponding long-term monthly averages (compared with 30% to 60% in the Southeast). Due to such low levels of rainfall, and the more limited success of the rationing program in the region, a series of three ‘mandatory holidays’ were introduced for the Northeast during October and November 2001. The Northeast accounts for 13% of Brazil’s GDP and has significant petrochemical, textile, sugar, aluminum and paper sectors. The cutback has forced schools and businesses to close, disrupted transportation and commerce, and intensified regional tensions between the Northeast and Southeast.

B. Microeconomic Linkages

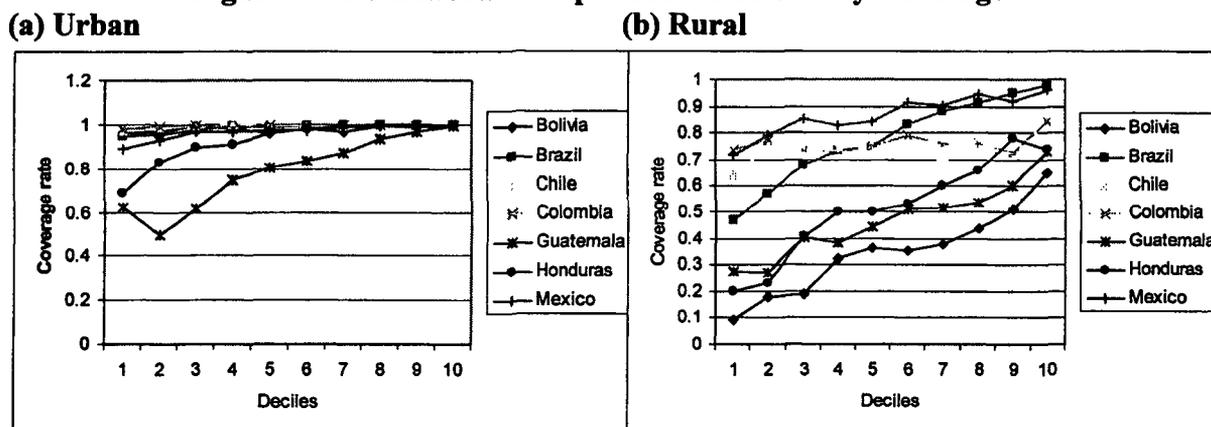
11. **Beyond the serious macroeconomic impacts described above, access to affordable electricity also contributes more directly to the welfare of poor households.** It has been empirically established that—due to the inefficiency of traditional substitutes such as candles and kerosene lamps—households without access to electricity pay a much higher price for energy. Recent empirical work from Guatemala estimates that households without access to electricity pay on average about US\$10 per kWh for lighting and battery-powering of electrical appliances, compared to US\$0.1 per kWh for households with access to electricity. The same analysis shows that the poorest (first quintile) households with and without electricity spend approximately the same amount of money on lighting and powering electric appliances, however those with electricity obtain almost 30 times more effective energy from this expenditure. There are thus very substantial benefits to poor households from obtaining an electricity connection.

Reaching Universal Coverage

12. **Although access to electricity is universal in urban areas, there is still a substantial coverage deficit in rural areas.** In common with most other South American countries, Brazil has achieved virtually universal access to electricity in urban areas (Figure 1). Estimates of rural electrification rates are subject to considerable uncertainty; however, coverage rates of between 55% and 75% have been estimated from existing data, and more precise information will become available once the results of the 2000 Census have been published. On this basis, the rural population without electricity is estimated to lie between 2 to 4 million households (equivalent to between 10 and 20 million people). It is also important to note that there are huge disparities across states, with rural electrification rates as high as 96% in the Southern state of Santa Catarina and as low as 0.8% in the Northern state of Pará (see map at the end of this report).

13. The vast majority of households without electricity are living in conditions of considerable poverty. Access to electricity in rural areas is very inequitable, with coverage rates of less than 50% in the bottom income decile and almost 100% in the top income decile (Figure 1). The recent World Bank Poverty Assessment found that 73% of households without an electricity connection were living in extreme poverty. Moreover, a study by the Institute of Economics at the Federal University of Rio found that around two-thirds of households living without electricity have incomes of less than two minimum wages per month (Figure 2). An important corollary of this is that resources channeled into rural electrification will be very well targeted towards the poor.

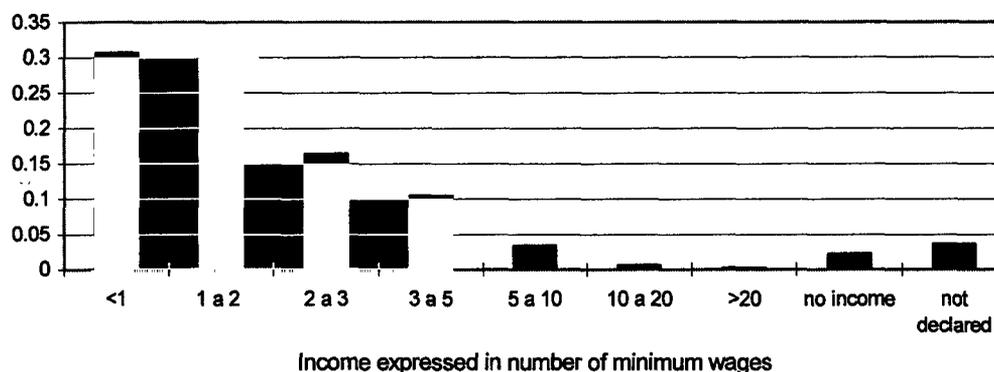
Figure 1: International Comparisons of Electricity Coverage



Source: The figures are derived from recent household survey data from each of the countries indicated. The source of information for Brazil is the PNAD, 1996.

14. There is at present no clear policy framework governing the rural electrification process. Moreover, the existing legal framework incorporates a number of flagrant contradictions. First, although the Ministry of Agriculture (MAG) is legally responsible for rural electrification, most existing initiatives are being led by the Ministry of Mines and Energy (MME) via Eletrobras. Second, a law passed in 1996 (Law 9427) establishes that concessionaires are entirely responsible for the investment costs associated with service expansion, and that no connection charge should be required from the customer. However, this law has yet to be implemented, and therefore current schemes continue to rely on the previous principle that customers should cover 90% of the connection costs. Third, the various concession contracts with the distribution operators, embody a very wide range of different types of universal service obligations. However, none of them establish clear targets and deadlines for rural electrification.

Figure 2: Distribution of population without electricity by income level



Source: IBGE – PNAD 1995

15. **The Government is in the process of strengthening the universal service obligations of distribution concessionaires.** A law recently passed by the Brazilian congress (Law No. 10438/02), together with new regulations being developed by ANEEL, would introduce explicit connection targets for distribution concessionaires with the aim of reaching universal coverage within a two to ten year period (depending on the State). The proposed financing mechanism would be a cross-subsidy from existing customers to new customers; meaning that the costs of expansion would be financed through general increases in the electricity tariff in each concession area rather than through connection charges alone. The new norms would also introduce greater regulatory flexibility for rural services, and provide incentives for the use of renewable energy. It should be noted that rural customers already benefit from a cross-subsidy in their service tariff, since they pay only 60% of the charge faced by urban customers, and moreover are often more costly to service due to their isolated locations. This makes them commercially unattractive to serve, undermining incentives for further expansion of coverage.

16. **The Government and a variety of donors are supporting a range of different initiatives designed to promote rural electrification.** The federal government supports two major programs, *Luz no Campo* managed by Eletrobras, which focuses on grid extensions, and the State and Municipal Energy Development Program (PRODEEM) managed by the Ministry of Mines and Energy, which focuses on photovoltaic energy for remote communities. The Ministry of Agriculture has its own separate initiative. Moreover, a number of states have developed their own rural electrification programs, notably Minas Gerais, Ceara and São Paulo. Finally, donor agencies are also active in the sector. The World Bank Poverty Alleviation Program has electrified more than 280,000 families in the Northeast at a cost of US\$115 million (or about US\$400 per household). In addition, the Japanese Special Fund and the Inter-American Development Bank (IDB) are backing a R\$19 million (US\$7 million) project to develop pilot models for rural electrification.

Table 1: Comparison of principal rural electrification schemes

	Luz No Campo	PRODEEM
Established	1999	1994
Agency	Eletrobras	MME
• Administration	Distribution companies	Municipalities
• Implementation	Periphery of service areas	Isolated communities
Target population	Grid extension	PV Panels
Technology		
Beneficiaries		
• To date	290,000 households	4,100 communities
• From now until 2002	710,000 households	10,000 communities
Investment to date	R\$1.74 billion (US\$0.64 billion)	R\$56.7 million (US\$21 million)
Source of funding	RGR Universal Service Levy	Federal budget
Financing mechanism	Loans	Grants

17. **Efforts so far have focused on grid extension.** *Luz No Campo* is the single largest program, aiming to connect a million rural households in the three year period 1999/02 (see Annex 3 for state level coverage targets). However, as of October 2001, only 290,000 connections have been made. The program has been funded by the Global Fund for Reversion of Power Sector Asset Ownership (RGR) and administered by Eletrobras. The RGR is a universal service levy equivalent to 2.5% of the value of investments made by electricity operators, that is added-on to consumers' electricity bills. The levy has raised R\$1.74 billion (US\$0.64 billion) for the *Luz No Campo* program to date. The resources channeled through the *Luz No Campo* program are mainly used to provide loans for distribution concessionaires to finance grid extensions in rural areas. The terms of the loans provided by Eletrobras to the distribution companies are very favorable, with a 6% interest rate, 2 year grace period, and 5-10 year payback period. The average cost of a new connection has been R\$2,326 (US\$860). Rural consumers are typically expected to pay the full costs of the connection, albeit spread over a number of years. In some cases, the state governments provide partial subsidies.

18. **Experience with off-grid electrification has been very limited, and subject to problems of unsustainability.** The dispersed nature of unserved populations in Brazil would suggest that off-grid solutions are also necessary in order to reach universal coverage in the most cost-effective manner. However, there has been limited experience with this approach. The main government sponsored off-grid electrification program is PRODEEM, established in 1994. Under this program, the Ministry of Mines and Energy (MME) procures photovoltaic panels that are then allocated free of charge to municipalities on demand. The program focuses on electrifying schools, health posts, and other community installations, rather than individual households. To date, PRODEEM has procured 3MW of photovoltaic panels, at a total investment of R\$56.7 million (US\$21 million). There are plans for a second phase of PRODEEM to focus more on private productive uses of energy. The budget for 2001 has been increased to R\$60 million (US\$22 million), and the target for 2001/3 is to reach a further 18,000 communities.

19. **A key failing in off-grid electrification programs has been the absence of institutional mechanisms for maintaining the systems.** A recent evaluation of the first tranche of installed systems found that on average 56% of the systems had broken down within three years of installation. This average is misleading since in those states where maintenance had been taken over by state-owned distribution concessionaires (São Paulo, Minas Gerais) 100% of systems were found to be in functioning order, whereas in those states where there was no maintenance support (Ceara, Alagoas) none of the systems were in working order. The absence of formal financial compensation for such maintenance activity has made privately owned distribution companies unwilling to take on this task.

20. **To summarize, there are a number of significant problems with the current approach to rural electrification in Brazil.** Although the Government has some important rural electrification initiatives underway, there are important inconsistencies in the policy framework that prevent these programs from being more effective. The main issues can be summarized as follows.

- Lack of coordination between the different programs that support rural electrification, as well as lack of consistency in their financing policies.
- Lack of clarity in universal service obligations faced by distribution concessionaires, as well as lack of financial incentives for them to invest in rural electrification, or to maintain and operate rural investments financed by other players.
- Lack of mechanisms to ensure efficient technology choices between grid-based and off-grid solutions to rural electrification, including adequate differentiation between quality of service and other regulatory parameters between urban and rural areas.
- Lack of clarity regarding the potential role to be played by agents other than the distribution concessionaires in reaching universal coverage.
- Lack of focus on maximizing the social and economic benefits to communities by promoting productive uses of energy.

21. **The proposed operation aims to clarify the policy framework for rural electrification, and to elicit a commitment to concrete electrification targets.** The first step will be to establish a coherent national strategy for rural electrification, resolving some of the contradictions identified above and defining the respective roles of grid-based and off-grid electrification programs. Thereafter, concrete electrification targets will be established for each specific distribution concessionaire, to meet the Government's universal access objectives within a proximate but realistic time horizon, estimated to lie between two to ten years depending on the state.

Providing a Rigorous Basis for Social Tariffs

22. **Prior to the sector reform process, all residential customers were eligible for discounts on their electricity bills.** These became progressively smaller for higher consumption blocks, tapering gradually away to zero at a subsistence consumption threshold

of around 200 kilowatt-hours per month. In 1995, a number of important changes were introduced. First, the magnitude of the percentage discounts was reduced. for those consuming below the subsistence threshold. Nonetheless, discounts remain substantial with those consuming less than 30 kilowatt-hours per month receiving tariff reductions of 45%. Second, those consuming above the subsistence threshold no longer receive any discount on their first few blocks of consumption. Third, eligibility for tariff discounts was confined to those meeting low income eligibility criteria.

23. Discounts were subsequently confined to low income customers, without any consistent eligibility criteria for identifying them. Instead, each distribution concessionaire has been at liberty to determine its own subsistence threshold (ranging from 140 to 220 kWh per month) and its own eligibility rules for these discounts. As a result, a wide range of different criteria are in use including the technological characteristics of the connection, the installed load, the type of dwelling, and the geographical location. Moreover, ANEEL reports that the proportion of customers eligible for low-income tariffs in any particular state bears little correlation with the known levels of poverty in different states. Some concessionaires even claim that none of their customers are eligible to receive low-income tariffs, which is implausible given that 23% of the country's population lives in poverty. A study currently underway is documenting the details of practice in each concession area.

24. The proposed operation will support the rationalization of social tariffs to ensure that they are more consistently and effectively targeted towards the poor. There is evidently a need to rationalize the basis of social tariffs for electricity, and to place them on a sound economic footing. A number of issues arise.

- First, there is a need to ensure that low-income tariff discounts are financed in such a way that they do not undermine incentives for private operators to serve poor households, as tends to happen with traditional cross-subsidies. A preferable approach may be to charge uniform tariffs to all customers, but to partially subsidize the bills of low-income customers from an escrow account funded by a general tariff surcharge.
- Second, there is a need to harmonize the social tariff policy for urban and rural areas. At present, all rural customers receive a discount of 50%, regardless of their income or consumption level; whereas the discount of 45% on urban tariffs is limited to subsistence consumption by low-income customers.
- Third, it is inappropriate to place eligibility for social tariffs at the discretion of the distribution operator, since this is likely to generate perverse incentives. Such eligibility criteria should rather be a matter for government policy to decide.
- Fourth, the criteria used to establish eligibility for tariff discounts need to have a proven link with the poverty status of households. The selection of these criteria needs to be based on an empirical analysis of the correlation between electricity consumption, poverty, and other observable household characteristics that might potentially serve as screening mechanisms.
- Fifth, it is important to remember that what ultimately matters is not the official tariff faced by low-income customers, but what they actually end-up paying to the

utilities. Non-payment of electricity services in Brazilian cities is estimated to be of the order of 5%.

III. RECENT MACROECONOMIC DEVELOPMENTS

Macroeconomic Reforms Since 1990

25. **Starting in the early nineties, Brazil has adopted a comprehensive package of economic reforms that has fundamentally transformed its economy.** The reform package, implemented in different stages, covered diverse areas ranging from trade and monetary management to exchange rate policy and the creation of fiscal institutions that enhanced credibility in the sustainability of public finances. The first stage, until 1992, involved trade liberalization with average import tariffs being lowered from 39 to 15 percent, flexibilization of capital account transactions and establishment of the regional trade agreement, Mercosul. A second stage of reform began with the Real Plan in 1994 and concentrated on monetary stabilization with the most striking development being the reduction of inflation rates of the order of 5000% in mid-1994 to 6% in 2000. This reform stage also involved constitutional changes that reduced earmarked expenditures and allowed fiscal policy to regain some flexibility. These changes, plus a favorable external environment, brought about the end of chronic and high inflation and an average annual growth rate of 4.2% in the 1992-1997 period. Simultaneously, demand for foreign savings increased as the current account went from zero in the period 1990-1994 to a deficit of 4.2% of GDP in 1998. Following monetary stabilization in 1994, the authorities undertook a series of further reforms including a large privatization program and stabilization of the financial system.

26. **To reduce the vulnerability to external shocks and to ensure a sustainable debt path, Brazil has, since 1998, undertaken ambitious and credible fiscal adjustment.** Fiscal adjustment lagged other elements of the reform program but was implemented in earnest after the Russia crisis in late 1998. Supported by an IMF program, the Government has since complied with quarterly fiscal targets and consistently generated a consolidated primary fiscal surplus of more than 3% of GDP. The Public Sector Borrowing Requirement (PSBR) has fallen to between 4% to 6% in the last two years. At the same time, the institutional framework for fiscal management has been improved. In early 1999 authorities in Brazil adopted a flexible exchange rate and an inflation-targeting framework. Growth prospects have been enhanced due to reduced vulnerability to both external and domestic shocks, achieved by smaller trade deficits and the elimination of primary public sector deficits. The key elements to achieve these outcomes have been the adoption of the floating exchange rate regime, the credible and permanent reduction in the inflation rate, the tax increases, strict austerity of those expenditures directly under governmental control and the adoption of the Fiscal Responsibility Law that supported adjustment processes, specially at the subnational level.

Recent Developments

27. **The positive outlook for Brazil that prevailed in early 2001 was dampened by the international slowdown, recent events in Argentina, and a domestic energy crisis.** After

a growth of 4.5% in 2000, a similar performance was expected for 2001. Then international demand began to soften as the result of the global slowdown. Events in Argentina and in international capital markets led to depreciation and required a tightening of monetary policy to contain the inflationary pressure resulting from the depreciation. Fiscal policies were tightened to maintain public debt sustainability in the face of higher interest rates and a depreciated currency. Finally, under-investment due to weaknesses in the regulatory framework brought about an energy crisis with electricity rationing that constrained economic activity. The domestic slowdown resulting from all these factors together meant that growth in 2001 was only 1.5%. As a result of the negative external and internal shocks, sovereign bond spreads rose, and the *real* depreciated by almost 40% in the first 9 months of 2001. However, it recovered by 16 percent in the last quarter of 2001, so that depreciation over the year as a whole was only 16 percent. Over 2002, rates have been broadly steady, inclined towards mild appreciation of 0.2 percent in the first quarter.

28. It is estimated that of the 3.0 percentage point shortfall in economic growth in 2001, about 1 percentage point is probably attributable to the energy crisis. An interesting question is the extent to which these different external and domestic shocks contributed to the 3.5% shortfall in GDP growth. The simultaneity and wide-ranging impact of each of these shocks makes it particularly difficult to disentangle the effects of each one. Moreover, there are important interactions between the growth impacts of the external and domestic shocks, since the opportunity cost of energy rationing will evidently be lower when the economy is moving into a recession than when aggregate demand for energy-intensive industrial output is buoyant. It is estimated that about 1 percentage point of the shortfall is attributable to the energy crisis, and the remainder to the external shocks. Moreover, the macroeconomic consequences of energy rationing would have been considerably higher if large industrial customers had not been given the flexibility to trade consumption quotas amongst themselves.

29. The resolution of the energy crisis led to a 20% tariff increase in 2001, which could have added about 1 percentage point to the Consumer Price Index. While the immediate reaction to the energy crisis was to impose a 20% rationing target on much of the country, consumer tariffs are now having to increase as the government corrects the tariff distortions that gave rise to the crisis and negotiates compensation deals with generators and distributors. It is estimated that the overall impact of these tariff increases was 20% during 2001. According to central bank estimates, this tariff increase may have added about 1 percentage point to inflation in 2001. While not insignificant, the possibility of such a price level increase—if indeed it occurred—does not hold-up as an argument against key energy pricing reforms. Nevertheless, there remains an on-going tension between inflation control and energy sector policy in Brazil. Following the hyper-inflationary experience of the 1980s, the central bank is understandably unwilling to countenance indexation measures of any kind. At the same time, the policy of private sector participation in the energy sector, is unlikely to function unless foreign investors are provided with some kind of systematic protection from exchange rate movements that substantially affect the costs of finance and gas purchase. At present, this tension has been dealt with by providing only partial compensation for exchange rate movements, and by limiting cost pass-through to annual adjustments as opposed to automatic monthly indexation.

Medium-term Outlook

30. **As the result of effective macroeconomic management and a swift policy response, Brazil is expected to withstand the current turbulences with reduced growth but without major disruptions.** The Government has maintained effective macroeconomic management and reacted to the shocks with an appropriate mix of monetary and fiscal tightening and continued push for structural reforms. The energy crisis has been managed well under the circumstances, and the rationing response has worked well. Fiscal policy has remained robustly credible, with a primary surplus of 3.7% of GDP in 2001, exceeding the previously set target. The signing of a new IMF 15-month Standby Arrangement on September 14, 2001 lent further credibility at a difficult time. And finally, the continued assured management of challenging macroeconomic circumstances by authorities has been a key signal to the markets. Reflecting regained market confidence, sovereign spreads have fallen, and the *real* has strengthened from a yearly low of 2.78 to the dollar in mid-October 2000 back to 2.30 in July 2001. The outlook for 2002 includes a GDP growth rate of 2.3% (against 1.5% achieved in 2001), a steady inflow of foreign direct investment, and a reduced current account deficit.

31. **Brazil's large public debt and high external financing requirements imply continuing vulnerability to future shocks, but this vulnerability is expected to decline gradually over time.** As a result of the depreciation and the increase in interest rates, the ratio of net public debt to GDP rose to 54.8% in October 2001, compared with 49.5% in October 2000. Public debt to GDP declined somewhat by end 2001, to 53.3%. The year-end decline reinforces the conclusion that earlier increases during the year resulted almost entirely from the depreciation of the exchange rate, rather than loose fiscal policy. Of the R\$124 billion increase in net debt over the past twelve months, 76.2% was attributed to the weakening currency. Moreover an estimated fifth of the increased public sector borrowing requirement in late 2001 was due to the acknowledgement of public debts known as 'skeletons,' such as the public bank debt write offs as well as worthless or illiquid securities in state-run pension funds. Such measures reduced hidden fiscal liabilities and made the Government's accounts more transparent. In response, and consistent with the credible fiscal stance adopted over the last three years, the Government raised its primary surplus target to 3.5% of GDP, which ensures a declining debt to GDP ratio under the worsened circumstances. Regarding the external accounts, the trade balance has improved through a compression of imports in response to the depreciation. A substantial surplus in the trade balance is expected for 2002. The Foreign Direct Investment (FDI) has declined from its record levels in the past two years but remains substantial, estimated to have reached about US\$19bn in 2001. Current projections include a gradual improvement in the current account balance (which was US\$-23.2 billion in 2001, or 4.6 percent of GDP) and in external debt indicators.

32. **Brazil has continued the structural reforms necessary to reduce the vulnerabilities related to its large public debt and high external financing requirements and needs to further pursue these on a continuing basis.** Improvements in the institutional framework for fiscal management continue with the effective implementation of the Fiscal Responsibility Law and refinements of the Plano Plurianual (PPA). Further public-sector pension reform remains a key item on the agenda of structural fiscal reforms.

Financial sector reforms are proceeding, including a first phase of federal bank reform and the expectation of legal reforms in the financial sector. The recent signing of a new Corporate Law is expected to promote development of Brazil's capital market through improved corporate governance. With respect to other growth-promoting reforms, measures are being taken to address the regulatory weaknesses that have led to the current energy crisis. Congress has recently approved important measures to flexibilize the labor code. Other important medium-term reforms should include improvements in the efficiency of the tax system.

IV. ENERGY SECTOR: DEVELOPMENTS, ISSUES AND REFORMS

A. Key Features of the Energy Sector

Anatomy of the Power Sector

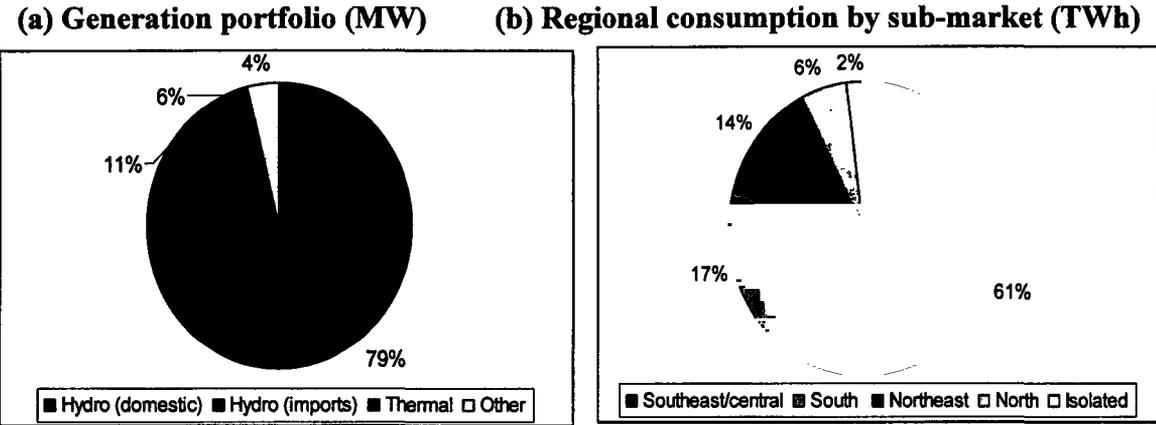
33. **The Brazilian power sector is globally unique because of its almost exclusive reliance on hydroelectric generation, which accounts for 90% of generating capacity** (Figure 3a). This proportion is high even by the standards of other predominantly hydroelectric systems, such as those of Chile (65%), the Nordic Pool (50%), Spain (50%), and Colombia (67%). Moreover, the MME estimates that the current 60 GW of developed hydroelectric resources represent a relatively small proportion of the country's remaining hydro potential. This is estimated to be of the order of 226 GW (125 GW inventoried and 101 GW estimated); however taking into account environmental restrictions and likely cost-effectiveness relative to other fuels, 144 GW is probably a more realistic assessment. Expansion of hydroelectric generation will take place mostly in the South/Southeast and in the Araguaia/Tocantins basin, closer to the most densely developed/urbanized areas of the country. There are no major investments foreseen in the Amazon in this period.

34. **The hydroelectric system is characterized by large river basins and major reservoirs with long-term storage capacity.** Another distinguishing feature of the Brazilian system is the relatively large size of river basins, which means that most of the country's 220 larger (above 10MW) hydroelectric stations, and all of its 21 largest stations (above 1,000MW) are located in a series of cascades along the five major national river basins. This arrangement leads to important externalities between the operating decisions of different stations located on the same cascade, which are often controlled by different companies, and has therefore motivated the centralized control of dispatch.

35. **The generation portfolio is expected to shift gradually towards thermal generation over time.** Following discovery of major natural gas reserves in neighboring Bolivia, the incipient gas market in Brazil has been boosted by the completion of the Bolivia-Brazil gas pipeline. The pipeline is capable of supplying 30 million cubic meters of gas per day, equivalent to about 7 GW of combined cycle gas fired plants. However owing to capacity constraints in upstream pipelines in Bolivia, Brazil is currently receiving only 13 million cubic meters per day. Thermal generating capacity is projected to double over the period 2001/06, from 7 GW to 16 GW. Even then, thermal would continue to represent only 16% of the generation portfolio.

36. Most new generation projects since 1998 have sponsors with upstream or downstream commercial interests, and are typically co-financed by the state. A detailed review of generation capacity coming on-stream between 1998 and 2007, is presented in Table A3.4 of Annex 3. However, there is still considerable uncertainty surrounding the completion of any of these plants, with environmental difficulties being one of several problems contributing to delays and cancellations. A number of factors are striking about the composition of new plants. First, more than two-thirds are hydroelectric. Second, about half of the planned new capacity is being developed either by companies with upstream interests in gas supply or by companies with downstream interests in distribution or large scale industrial use. Finally, much of the new generation is co-financed by state-owned enterprises such as Petrobras and the Eletrobras subsidiaries.

Figure 3: Anatomy of the Brazilian Power Sector



Source: Erber (2001)

37. Due to a number of transmission bottlenecks, the national grid can be separated into four regional sub-markets (Figure 3b). The Brazilian power market registered a total consumption of 306 TWh in 2000. Demand is growing at about 5.3% per annum. The market operates as four partially inter-connected regional sub-markets, of which by far the largest is that of the Southeast/Central region which accounts for more than 60% of national consumption. The major links between these sub-markets are a 1,000 MW transmission tie connecting the North to the Northeast and to the Southeast/Central sub-markets, and a 2,000 MW tie (via the Itaipu power plant) connecting the South to the Southeast/Central sub-market. The South is connected to Argentina by a 1,000 MW tie. These ties are insufficient to allow the full utilization of occasional and some permanent surpluses in specific sub-markets. Projects currently underway will duplicate the capacity on all of these inter-connectors. However, these inter-regional links will not provide their full benefit unless several significant local bottlenecks within each sub-market are eliminated.

Power Sector Restructuring

38. **Until the mid-1990s, the Brazilian power sector had developed along traditional state-owned lines.** Power services were provided by about 70 public utilities, with a combination of federal, state and municipal ownership. The federal government, through Eletrobras and its four major regional subsidiaries (Furnas, Chesf, Eletronorte and Eletrosul), controlled 58% of the generation assets and about 75% of the national transmission network. State and municipal companies (together with some small private operators) were primarily responsible for electricity distribution, covering 80% of retail customers, but also had significant interests in generation and transmission. Any surplus energy produced by local companies was purchased by the Eletrobras subsidiaries, which were responsible for bulk sales.

39. **In 1995 Brazil embarked on a power sector restructuring process.** The purpose of the reform was to move from a centrally controlled, government-owned sector, to a competitive system largely under private sector ownership. The reform was motivated by a desire to attract private investment into the power industry, and improve the overall efficiency of the system. The key reforms were enacted in Laws 8987/95, 9074/95, 9427/96 and 9648/98. For a detailed description of the contents of this legislation see Table A3.3 of Annex 3. This legislation set out some of the main features of the new institutional framework, including the requirement to vertically unbundle power utilities, the creation of an independent system operator (ONS), a wholesale electricity market (MAE), a planning agency (CCPE), and a regulatory agency (ANEEL). These laws also specified some of the structural changes needed to make the transition to the new model, including the unbundling of vertically integrated companies, the introduction of free negotiation for bulk supply, and the expiry of all existing long-term contracts between generators and distributors.

40. **The necessary process of vertically unbundling generation from transmission and distribution assets has become politically paralyzed at a relatively early stage.** At the outset of the reform process in 1997/8, a number of major companies went through a process of vertical unbundling whereby generation assets were transferred into a separate company from transmission or distribution assets, and in some cases were sold on to the private sector. These companies included one of the Eletrobras subsidiaries (Eletrosul) and some of the larger state utilities (CESP, Eletropaulo, CEEE-RGS and CELG). Altogether, about 42% of national generation capacity was vertically unbundled, and 23% was ultimately privatized. The vast majority of the remaining generation assets are held by the three other Eletrobras subsidiaries (Eletronorte, Chesf, and Furnas). Although these three companies introduced accounting separation, it has proved difficult to make any further progress with the unbundling process. The absence of progress with unbundling is a serious concern, since international experience demonstrates that neither accounting separation, nor even creation of separate but affiliated legal subsidiaries, is enough to prevent anti-competitive behavior.

41. **Consequently, the Eletrobras subsidiaries continue to occupy a dominant position in the generating sector, particularly in certain regional sub-markets.** The failure to make progress with the divestment of federally owned power assets has left Eletrobras in a dominant position. Even though no individual subsidiary controls more than 16% of the national market, in combination the remaining Eletrobras subsidiaries (including

Itaipu) account for almost 60% of national generating capacity (Table 2). Furthermore, at the level of individual sub-markets the concentration of market power is much more extreme. Eletronorte controls almost 90% of the capacity in the northern sub-market, while Chesf controls almost 100% of the generating capacity in the Northeast. Evidently, this kind of market structure severely limits the degree of real competition in the generating sector. Ultimately, the creation of a level playing field between generators will require most of the remaining federally-owned generating assets to be broken-up and privatized. Furthermore, as a precursor to privatization, it will be necessary to break-up the packages of generating assets held by each of the three main federal companies, in order to ensure that no company occupies a dominant position in any of the four regional sub-markets.

Table 2: The enduring market power of Eletrobras
(percentage of generating capacity in national and regional markets in 2001)

	Eletrobras Subsidiaries					Eletrobras Total
	Eletronorte	Chesf	Furnas	Itaipu*	Cgtee	
North	87.6					87.6
Northeast		97.2				97.2
Central/Southeast			31.5	27.3		58.8
South				18.6	3.8	22.4
National	16.1	15.4	8.4	17.5	0.7	58.1

*Includes Brazilian share plus wholesale purchase of Paraguayan share.

Source: Erber, 2001.

42. **There has been substantial progress with privatization in the electricity distribution sector.** Between 1995 and 2000, 24 electricity distribution utilities were privatized with an aggregate sale value of US\$22 billion, and a total debt transfer of US\$6 billion. As a result, private operators account for 64% of retail sales. Moreover, the privatization of one of the principal remaining state distribution companies, COPEL, is currently underway. However, the initial attempt to privatize COPEL in November 2001 failed when all six pre-qualified blue chip foreign strategic investors withdrew from the bidding process, discouraged by the uncertainties of the crisis environment. The State of Paraná is currently preparing a second auction under revised terms.

43. **However, many distribution companies continue to have significant interests in generation, introducing the danger of uncompetitive self-dealing arrangements for power purchase.** Many of the distribution companies, including those that were privatized since 1995, own substantial generating capacity. In recognition of potential anti-competitive behavior, ANEEL has imposed limits of 30% on self-dealing for power purchase by distributors from their own generators. However, not only are these limits comparatively high, but there is evidence that they incorporate significant exceptions (such as thermal plants built by 2003) and moreover are not being enforced in practice. The ultimate success of Brazil's efforts to create a competitive power system will depend on clear vertical and horizontal limits on cross-ownership between different entities in the sector. The full completion of vertical unbundling in the distribution sector is complicated by the fact that the distribution utilities fall within the jurisdiction of State governments making it more difficult to reach political consensus. Nonetheless, international experience suggests that this problem will need to be tackled sooner or later. For example, in Bolivia the 1995 electricity law prohibits generators from having ownership interests, either directly or indirectly, in

distributors and vice versa. Similar restrictions exist in Argentina and have been instrumental in the development of effective competition. Without a similar structural foundation in Brazil, competition will be inhibited.

44. A parallel reform program in the upstream gas sector has terminated the legal monopoly of Petrobras. Since its creation in the fifties, Petrobras held the national monopoly for exploration and exploitation of petroleum and gas, refining, maritime transportation, and pipeline transportation. Exceptions were the distribution of petroleum products, which was open to domestic and foreign investors, and distribution of natural gas, which was the legal responsibility of the state-owned distribution companies. The constitutional review of 1995, and subsequent Hydrocarbons Law of 1997, ended the legal monopoly of Petrobras and sought to open the sector to competition under the supervision of a new regulatory agency, Agência Nacional do Petróleo (ANP).

45. However, in practice Petrobras continues to occupy a dominant position. Although Petrobras has established a separate transportation subsidiary, as required by the new law, no further restructuring is contemplated, and the dominant position of Petrobras is likely to complicate the development of effective competition in the sector. ANP has been taking a number of measures to try and promote new entry, for example by auctioning concessions for the exploration and development of new petroleum fields, and for the development of marginal pipeline capacity on existing rights of way. In addition, two new pipeline projects, one of them involving a connection with Argentina, are currently being developed without Petrobras involvement. Although the regulatory framework mandates open access to all gas pipelines, the fact that there is currently no excess capacity in the Bolivia-Brazil pipeline means that this legal requirement has yet to become a reality.

46. Lack of competition in gas supply is seriously prejudicing the development of new private sector thermal generating capacity. Given that gas imports from Bolivia are the key input for new thermal generating plants, these developments in the hydrocarbons sector have an important follow-through effect on power sector reforms. At present, the only option available to developers of new thermal power generation is to obtain Bolivian gas via a dollarized take-or-pay contract with Petrobras. However, given the fact that thermal plants only operate on an occasional basis in a system dominated by hydroelectric plants, and that there is no system of capacity payments to generators, or any secondary market in gas supply, it is extremely difficult for new investors to recover the costs associated with these rigid gas supply contracts.

Table 3: The evolving structure of the Brazilian energy sector

	Pre 1995	2001	Long-term Vision
Gas supply	Publicly owned vertically integrated monopoly, Petrobras, responsible for exploration, transportation and bulk supply. Publicly owned state companies responsible for distribution.	Legally open access to exploration, transportation and bulk supply activities, but in practice Petrobras continues to occupy a dominant position. Some state distribution companies have been privatized.	Petrobras faces effective competition in exploration, transportation and bulk supply, with open access to existing pipelines and rights of way. All state distribution companies have been privatized.
Generation	Publicly owned, vertically integrated federal companies, for generation and transmission.	23% of generation capacity in private hands, but market continues to be dominated by vertically integrated Eletrobras subsidiaries and Petrobras joint ventures.	Privately owned, vertically unbundled companies.
Transmission	Publicly owned, vertically integrated federal companies, for generation and transmission.	Publicly owned, vertically integrated federal companies for generation and transmission.	Publicly owned, vertically unbundled companies, operating under an independent system operator.
Distribution	Publicly owned, mainly state companies, with some vertical integration, including generation, transmission and distribution.	64% of the market is in private hands, but vertical integration persists.	Privately operated, vertically unbundled companies.

47. To summarize, the structural reforms undertaken following 1995 were not sufficient to realize the long-term vision of a competitive energy supply market in Brazil. Table 3 shows the following problems in particular:

- No measures were taken to increase the effective competition faced by Petrobras in exploration, transportation and bulk supply of natural gas.
- Federally-owned vertically integrated transmission and generation companies were not fully unbundled thereby jeopardizing open access to the transmission network.
- Federally-owned generation assets were not horizontally broken-up so that the Eletrobras subsidiaries retained their considerable market power.
- Distribution companies failed to divest of their major generation and transmission assets, thereby creating the potential for abusive self-dealing arrangements.

New Government Institutions

48. **To complement the reforms in the industry structure, a number of new government institutions were created.** Prior to sector reforms, Eletrobras was responsible for planning and coordinating the expansion and operation of the electricity sector, as well as being the holding company for federally-owned power sector companies. The evident conflict of interest between Eletrobras planning and operating functions, as well as the absence of any autonomous regulatory agency to supervise the implementation of government policy, prompted a restructuring of government institutions in the sector.

49. **Policy-making remains the responsibility of the Energy Secretary at the MME.** In addition, the National Energy Policy Council (CNPE), which is a multi-ministerial body with broader stakeholder presentation, is responsible for advising the President on matters relating to energy policy. The CNPE has no technical staff of its own, but rather relies on the MME to provide the necessary support functions. An important constraint has been the lack of a permanent body of suitably qualified experts in sufficient numbers to support these policy-making activities within the ministry. Although this has always been a problem, at least prior to the reforms MME was able to draw upon a considerable body of expertise within Eletrobras. However, most of these human resources were dispersed as a result of the restructuring process, leaving the MME, and hence also the CNPE, seriously lacking technical support.

50. **Planning functions originally undertaken by Eletrobras were transferred to the Power System Expansion Coordinating Committee (CCPE).** The CCPE has a broad membership representing all the major stakeholders in the power sector. It is responsible for producing 10 year expansion plans for the generation and transmission sectors. In the case of generation, the plans are only indicative in nature, with investors at liberty to make their own decisions. In the case of transmission, the plans are mandatory, in the sense that new investment must conform strictly with the plan. However, unlike Eletrobras, CCPE does not have the cadre of high quality permanent staff that are needed to provide technical support and prepare the annual reports upon which the long-term plans are based. A further issue is the lack of clarity with regard to responsibilities for preparation of river basin inventories, formerly conducted by Eletrobras and major utilities. ANEEL has been carrying out or updating some of them, but recognizes that strategic studies should be the responsibility of MME.

51. **There is also ambiguity of jurisdiction regarding policy-making and regulatory entities in the energy and water sector when it comes to hydroelectric plants.** The National Water Resources Council (CNRH) and the Federal Water Regulatory Agency (ANA), in line with the National Water Resources Policy (Law 9433/97), have roles roughly symmetrical to those of CCPE and ANEEL in the power sector, and overall responsibility for the country's policy with regard to planning and licensing multiple uses of water that affect more than one state. The lack of clarity/inconsistencies in the role of CCPE/CNRH and of ANEEL/ANA with regard to policy making and planning (including with respect to environmental/social dimensions) needs to be resolved for the new model to function appropriately.

52. Responsibility for the dispatch of generating plants was transferred to an independent system operator. Given the objective of creating a competitive generation market, it was no longer appropriate for Eletrobras to be responsible for dispatch, since it continues to own almost 60% of generation. In order to ensure non-discriminatory access to the national transmission grid, an independent system operator—ONS—was established in 1998. ONS is responsible for conducting the dispatch of all generating plants larger than 50 MW connected to the national grid, and coordinating the operation of the interconnected system, comprising all transmission lines in excess of 230 kV. The governing body—comprising 19 members in all—incorporates representation of the production (generators and importers) (43%), transmission companies (14%) and free consumers (distributors, large (>3MW) industrial customers and exporters) (43%); each with the voting shares indicated. However, the governance arrangements for the independent system operator (ONS) have proved to be problematic. This is so for two reasons. First, the relatively large number of members of the ONS governing board (19 in all) makes the decision-making process complex and unwieldy. Second, although the voting shares appear to be equitably distributed, in practice the continuing vertical integration of generation and transmission, effectively gives the Eletrobras subsidiaries a controlling share.

53. ANEEL was created as an independent regulator for the electricity sector, with a relatively broad range of responsibilities. The agency is governed by a five person directorate, appointed directly by the President, with the approval of the Senate, but without the involvement of the MME. ANEEL's unusually broad range of responsibilities include: issuing regulations to support the implementation of new legislation; awarding concessions to sector operators; designing hydroelectric inventories to optimize river flows; scheduling the transmission network expansion concessions; supervision of concession contracts; revision of tariffs; monitoring of service quality; dealing with customer complaints; certifying the firm energy of hydroelectric plants; and overseeing the operation of the wholesale market. The first three areas of responsibility described, in most countries would fall within the jurisdiction of the policy-maker rather than the regulator. Indeed, the responsibility for awarding concessions has very recently been transferred from ANEEL to MME. ANEEL is allowed to delegate some of its functions to state utility regulators, where these exist, however, this has not yet happened to any significant degree.

54. At present, there is no effective mechanism for private investors to appeal to a third party against regulatory decisions adopted by ANEEL. Although power sector operators are allowed to appeal decisions directly to ANEEL, the only possibility of obtaining an independent assessment of regulatory decisions is via the judicial system. Experience to date suggests that judicial appeals can take several years to complete, and that the judiciary is not technically equipped to deal with the complex economic and financial issues raised by regulatory disputes. The numerous disputes that have arisen between ANEEL and the private sector over the interpretation of the regulations suggest that the creation of such an appeals mechanism will be essential to building confidence in the impartiality and transparency of regulatory decisions.

55. **ANP was created as the regulatory institution for the hydrocarbons sector.** ANP was created in 1997. Similar to ANEEL, ANP is headed by a five-person directorate appointed directly by the President, with the approval of the Senate. The principal functions of ANP are as follows: implement national policy for the hydrocarbons sector; award and supervise concessions for exploration, development and production activities; issue authorizations for refining, processing, transporting and trading activities; define tariffs for pipeline transportation; protect consumer interests; organize and maintain technical records of the oil and gas sector and regulate the dissemination of new technical data; supervise compliance with oil products and gas conservation measures; support land expropriation procedures associated with the development of the hydrocarbons sector. Given the important linkages between the gas and electricity markets, there was some discussion as to whether ANP and ANEEL should be merged. This possibility is no longer under active consideration.

56. **To summarize, the key problems with the institutional framework created during the transition to the new sector model are as follows:**

- Allocation of some policy-making functions to the regulatory body ANEEL rather than to the MME.
- Coordination among agencies responsible for environmental regulation (ANA, IBAMA, CNRH), and between these and ANEEL.
- Coordination between ANEEL and ANP on matters regarding the role of hydrocarbons in the expansion of the electricity sector.
- Clarification and modification of the role of Eletrobras within the new power sector model.
- Clarification of responsibility for long-term strategic planning within the context of the new sector model.
- Resolution of the human resource constraints that prevent the policy-making functions from being adequately performed by MME and CNPE.
- Relative roles of ANEEL and the Anti-Trust Agency (CADE) in addressing competition issues in the power sector.

Generation Pricing

57. **The new vision of the power sector foresaw generators and distributors engaging in freely negotiated long-term bilateral contracts, with minor surpluses and shortages settled using a spot market.** In order to ensure a smooth transition to a competitive market, initial contracts were introduced in 1999 to cover 100% of the distributor's anticipated demand. The prices incorporated in the initial contracts were determined by ANEEL, and are set at an average level of about R\$50 per MWh (US\$20 per MWh). The prices embodied in the initial contracts still only reflect average historic costs of production rather than the marginal cost of new plants, which is estimated to be of the order of US\$38 per MWh. Since many generation assets have already been largely amortized, it is still possible for existing generators to operate profitably at these prices. The initial contracts will be phased out progressively, 25% per year, between 2003-06. Thereafter, distributors will be at liberty to

negotiate their own terms with generators, as long as they hold long-term contracts to cover at least 85% of their anticipated demand. In order to take into account the climatic uncertainty associated with hydroelectric plants, ANEEL is required to certify the amount of 'firm energy' that hydro generators may contract with distributors, based on a 95% reliability criterion.

58. Any differences between contracted and outturn volumes would be settled at the regulated spot market price. A key feature of the reform process was the introduction of a wholesale electricity market (MAE), based on an agreement between the key sector stakeholders. Major decisions relating to the MAE are taken by the General Assembly, where 50% of the votes are allocated to consumers (distributors, large industrial customers and exporters) and 50% to producers (generators and importers). Initially, supervisory and policy decisions were delegated to an executive committee (COEX) that consisted of about thirty members. However, this governance arrangement was found to be slow and susceptible to deadlocks. Consequently, in April 2001 ANEEL required that COEX be replaced by a smaller governing board called COMAE, comprising six counselors, two nominated by the generators, two by the distributors and two by ANEEL. Although four out of the six counselors were selected by particular constituencies, the counselors were not supposed to represent the commercial interests of these constituencies. The day-to-day operation of the MAE were supervised by a services manager (ASMAE), while the settlement of accounts was the responsibility of the Brazilian Financial Clearing House (CBLC).

59. The spot market price is determined mechanistically based on the output of a complicated software model used for dispatch. Like most Latin American countries, the Brazilian wholesale spot market operates as cost rather than a bid-based market. The price used to settle transactions on the MAE, is that determined by the independent system operator (ONS). ONS uses a computer algorithm known as NEWAVE, which is an economic optimization model designed to minimize the costs of meeting a given level of overall energy demand. The computer model determines which plants get dispatched (i.e. scheduled to generate electricity) and at what levels. One of the key parameters in this model is the opportunity cost of water, which is calculated on a five year forward looking basis, taking into account hydrological conditions, the cost of thermal generation, planned new generating capacity, and the marginal cost of a system outage. In contrast to hydroelectric plants, new thermal plants are at liberty to make their own price bids, and are dispatched depending on whether these lie above or below the opportunity cost of water. Whenever hydroelectric plants are at the margin, the opportunity cost of water that emerges from the NEWAVE model automatically becomes the price at which spot market transactions are settled on the MAE. In a system that is dominated by hydroelectric plants with relatively low short-run marginal costs, new thermal plants are only dispatched on an occasional basis when reservoir levels are exceptionally low.

60. There is significant scope for improving upon the current model by giving market participants a greater role in the determination of spot prices. The problem with the current system is that all economic decisions about generation are centrally imposed, making the sector particularly vulnerable to any errors or biases in the NEWAVE model. Nonetheless, a move towards an entirely decentralized bid-based dispatch model would probably be premature in Brazil given the various structural problems identified above

(namely concentration of market power, vertical integration, and dominance of publicly owned generators). It is also complicated by the interdependence between hydroelectric plants located on a single cascade. Significant improvements in efficiency could be achieved by allowing participants in the spot market to trade at freely determined prices, even while continuing to operate centralized cost-based dispatch. This modification would allow the spot price of electricity to reflect a much wider range of market information and stakeholder perceptions, reducing the vulnerability of the pricing mechanism to any errors and biases in the NEWAVE model. It would also give generators financial self-determination, rather than forcing them to trade at prices and quantities imposed from the center. This approach is increasingly being taken in European wholesale markets, and operated for more than twenty years in the New England Power Pool in the United States.

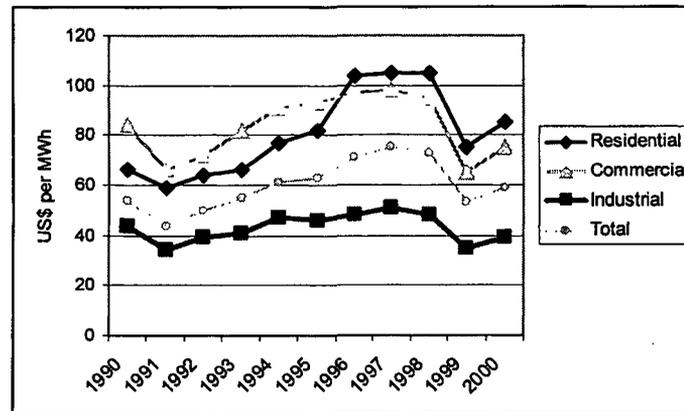
Transmission Pricing

61. **The structure of transmission prices is being altered to reflect geographical constraints in the network.** During the initial contract period, transmission pricing is based on a single 'postage stamp' charge per kilowatt of load, which does not vary with geographic location. The problem with this pricing mechanism is that it does not provide any incentives for generators to choose locations that minimize the sum of generation and transmission costs. As the initial contracts expire, or new long-term contracts are signed to cover incremental demand, a system based on nodal pricing is being introduced. The nodal prices reflect the marginal cost of system expansion at each entry point, and which may even be negative on some portions of the network where there is excess transmission capacity. However a 'postage stamp' component will be retained in the price structure to ensure that full average costs are covered and to provide more stable prices. It is estimated that the relative weight of nodal pricing and postage stamp pricing in the final tariffs will be three to one.

Distribution Tariffs

62. **The Government decided to adopt a gradual approach to phasing in cost-reflective electricity tariffs.** Decades of public sector control meant that at the time of sector reform electricity tariffs were significantly below cost-recovery levels. Tariffs were allowed to rise substantially in US dollar terms, from US\$45 per MWh in 1991 to US\$75 per MWh in 1997 (Figure 4). However, much of this increase was eroded by the subsequent devaluation of the Real, so that as of the year 2000, the US dollar value of the average retail tariff had fallen back to about US\$60 per MWh.

Figure 4: Evolution of average electricity tariffs in Brazil (US\$/MWh)



Source: Erber (2001)

63. **Distribution companies are allowed to pass-through uncontrollable costs, however, this has not been taking place in practice.** Although Brazilian law prohibits automatic and continuous indexation of prices, the regulatory framework allows annual cost pass-through of certain uncontrollable costs known as ‘Parcela A.’ These include taxes, levies, Itaipu charges, and the cost of power purchased under initial contracts. Overall, they account for about 40% of the overall costs to the end-user. Distributors have complained that ANEEL is not allowing the pass-through of ‘Parcela A’ costs. This dispute has recently been resolved by introducing ‘tracking accounts’ which allows future changes in uncontrollable costs to accumulate with interest during the course of the year, and then to be passed-through in a single step at year’s end. Moreover, distributors are being compensated retrospectively for the failure to pass-through ‘Parcela A’ items in the past.

64. **Distributors also have major complaints about the procedure for passing-through the cost of energy purchased under new long-term contracts (‘Valor Normativo’).** Distributors may also pass-through energy purchase costs on new long-term contracts up to a fuel-specific regulatory price cap known as the ‘Valor Normativo.’ ANEEL has established six different ‘Valores Normativos’ one for each of the major fuels, and these are revised on a periodic basis to keep pace with changes in costs. Private operators consistently identify the ‘Valor Normativo’ as a major obstacle to new investments in the sector. The complaints are twofold. First, they claim that the values of the ‘Valores Normativos’ are significantly below the true marginal cost of supplying new energy for thermal generation. Second, they argue that the procedures for setting and revising the ‘Valor Normativo’ are extremely opaque and create a great deal of uncertainty about the likely revenue streams that will accrue to generators. Moreover, they only partially compensate investors for movements in the Brazilian real against the US dollar. This makes it very difficult for a distributor to sign a long-term power purchase agreement with a generator, that would obligate the distributor to fully compensate the generator for any increasing cost (in Brazilian currency) of key inputs (such as natural gas) that must be paid for in US dollars. Hence, as initial contracts expire, the problems with the ‘Valor Normativo’ will make it increasingly difficult for distributors to meet their regulatory obligation to hold long-term contracts for at least 85% of their anticipated demands. There is consequently an urgent need

for ANEEL to develop more transparent, market-based mechanisms for determining allowable pass-through of energy purchase costs.

65. Distribution tariffs are reviewed by ANEEL every three to five years. The purpose of these reviews is to allow prices to adjust for changes in the cost of providing the distribution service. So far, ESCELSA has been the only utility to undergo a distribution tariff review. However, the other 56 operators are scheduled to undergo their first distribution tariff reviews in 2003-04. The ESCELSA experience revealed the complete absence of methodological principles and guidelines for tariff review, either in the concession contracts or in the sectoral legislation. As a result, ANEEL was forced to develop its approach to price-setting on a discretionary and 'ad hoc' basis, and the process was therefore characterized by a series of major methodological disputes between the regulator and the utility. Perhaps the most dramatic of these related to the methodology for valuing the regulatory asset base, with ESCELSA convincing ANEEL to increase the value of its asset base from R\$685 billion to R\$980 billion. This experience has generated a great deal of uncertainty for the 56 distribution companies that will shortly be facing their first reviews, and points to the urgent need to develop detailed methodological guidelines for the conduct of tariff reviews.

66. It appears that the distribution tariff structure in Brazil incorporates some degree of cross-subsidy from domestic to industrial customers. The retail tariff for residential customers in the year 2000 was US\$0.087 per kilowatt-hour, while industrial customers paid US\$0.039 per kilowatt-hour. It is to be expected that domestic tariffs should be significantly higher than industrial ones, since the former are more expensive to serve due to their smaller loads and their more extensive use of distribution facilities. Nonetheless, price differentials of this magnitude are probably not justified in terms of the underlying cost structures, suggesting that some cross-subsidy is taking place. ANEEL has recently developed a methodology for allocating distribution costs between different types of customers. The regulatory agency has tested the methodology using data from one of the distribution utilities, and found that residential tariffs for that company should be lowered by 10% and industrial tariffs raised by up to 20%. The practice in Brazil stands in contrast to most other Latin American countries, where industrial consumers are often required to cross-subsidize residential customers. However, the differential between industrial and residential consumers is similar to that in the US where in 1999 residential customers paid US\$0.081 per kilowatt-hour, against US\$0.044 per kilowatt-hour for industrial customers.

67. In summary, there are a number of reasons to believe that the overall average level of distribution tariffs had fallen too low in the period following sector reform. The discussion thus far illustrated a number of different reasons why tariffs had fallen too far below costs.

- The 'Valor Normativo' was no longer at a level commensurate with the long-run marginal cost of developing new thermal plants.
- The absence of full cost pass-through of historic costs accumulated under Parcela A, had prevented tariffs from keeping pace with recent cost increases.
- The absence of any regulatory methodology for updating the value of distribution company assets over time.

Environmental Management

68. **The Government has a long-standing and reasonably solid framework that regulates the handling of environmental and social issues in the power sector.** Licensing of power sector projects with regard to environmental and social impacts is regulated by norms that were largely adopted before the reform of the power sector. Within the general licensing framework established in Brazil in 1986, the power sector was the first sector for which specific regulations were developed (CONAMA Resolution No. 006/1987). Such regulations cover generation and transmission projects above a minimum size (10 MW in the case of generation, and 230 kV in the case of transmission) and require three licenses in the course of the project cycle. The United Nations Development Programme (UNDP) and the Ministry of the Environment and Renewable Resources (MMA) recently conducted an assessment of the effectiveness of the licensing system in Brazil. A specific study on the regulations that apply to the power sector was underway at the time of this writing. Overall, the results are positive while recommending some selective areas of improvement and adaptation to the new power sector context.

69. **Environmental and social safeguard functions previously shared with Eletrobras have been largely transferred to environmental regulatory and enforcement agencies.** In Brazil, environmental licensing responsibilities lie predominantly with state agencies. The Federal Government, through the Brazilian Environmental Institute (IBAMA), is in charge of licensing power sector projects in cases where these are bi-national or lie on national rivers, bordering two states. Nuclear plants are licensed by the National Nuclear Energy Council (CNEN). Before the reform of the power sector, this arrangement was supplemented by planning functions carried out within the power sector itself. Eletrobras established technical guidelines for handling environmental and social impacts of hydro, thermal and transmission projects, and carried out technical reviews of projects on behalf of the National Department for Water and Electricity (DNAEE), before submission to environmental licensing agencies at each pertinent stage of the project cycle. With the elimination of this technical function within the sector, demands on the technical expertise of environmental licensing agencies have increased significantly.

70. **Uncertainties and transaction costs associated with the licensing process are considerable.** Environmental licensing agencies, especially at the state level, are often not equipped to deal in a timely manner with the technically complex and controversial issues associated with the location, design and operation of power sector projects. Furthermore the recent trend in the country has been towards increased involvement of communities and local levels of government in environmental decision making, adding further challenges. Institutional strengthening at the federal and state levels is an ongoing but long-term effort, which is being supported by the Bank and the Inter-American Development Bank (IDB), among others. With regards to the current pipeline of projects, the licensing process has followed established procedures and is proceeding much as before privatization. The challenge is mostly for the future. In the new private sector-based model, the lack of a mechanism to minimize uncertainties and transaction costs associated with environmental licensing is a significant limitation.

71. **With the power sector still in transition, there is considerable lack of clarity with respect to institutional responsibilities.** Within the power sector, the basic set of environmental guidelines (for resettlement, indigenous peoples, flora and fauna, coal-fired thermal plants, among others) and methodologies (for environmental and social studies and activities at different stages of the project cycle) developed over the years by Eletrobras, in collaboration with the previously state-owned companies, is apparently still largely being used as a reference by ANEEL. The main concern is the lack of clarity with respect to institutional responsibilities for environmental planning, especially in the early stages of the project cycle.

72. **In the longer term, dealing with the environmental and social externalities generated by power sector projects requires coordination on the part of energy, water resource management and environmental agencies.** During the course of the reform process, the power sector has been drawing largely on an existing pipeline of fairly advanced projects (at feasibility or more advanced stage of study), including their respective environmental/social assessments and management plans. The pipeline of projects will need to be revisited soon for a number of reasons. First, since the Brazilian system is strongly hydro-based, an ad-hoc concessioning of individual projects in disregard of a comprehensive study of the complete cascade has drawbacks in terms of optimizing generating capacity. Second, optimal multiple use of water resources has gained importance since the approval of the National Water Resources Policy in 1997 and the creation of the CNRH and ANA. Inventories of river basins will need to be systematically updated to incorporate water resources management issues as well as heightened concerns on the part of local communities and Brazilian society with respect to environmental and social impacts.

73. **Several overlapping efforts are underway to address 'upstream' planning needs.** Given the increasing emphasis on a comprehensive resource management perspective, several agencies (ANEEL, ANA, MME and Eletrobras) are currently advancing methodological and other studies to respond to what they perceive as their mandate. It is quite urgent that responsibility for extensive river basin inventory work be clearly assigned and that a mechanism for institutional cooperation be put in place. A model of the longer-term planning responsibilities within the sector has been put forth by MME. Broad-based discussion and agreement amongst the key institutional stakeholders with regard to institutional mandates and procedures for long-term planning are under discussion in the Power Sector Revitalization Committee but are likely to require a longer timeframe. Thus this process and the specific recommendations that result from it should be supported in the next phase of the Sectoral Adjustment program. The ESTAL, which is being prepared in parallel with this adjustment loan, will support an update and revision of river basin inventories, including the environmental and social impacts of alternative cascade arrangements. Similar concerns apply to the case of thermal plants, where strategic studies of macro-siting are foreseen and would contribute significantly to reduce uncertainties related to the thermal program.

74. **A vision of the environmental and social implications of longer-term expansion of the power sector needs to be developed to reduce uncertainties and make best use of opportunities.** The power sector is currently operating in a crisis mode. Beyond this phase however, strategic planning will be an essential function in a capital intensive sector like the

power sector, with long lead times and major public interest issues at stake, especially as the private sector becomes increasingly involved. This implies a clear identification of the likely expansion paths (e.g., fuel uses, river basin development sequencing), key issues and implications of alternative paths (e.g., likely impacts), and options for addressing them (e.g., mitigation strategies, synergies with other initiatives, institutional, regulatory and methodological requirements, financial implications, funding opportunities).

75. **Annex 4** presents a more detailed description of the current framework for management of environmental and social issues in the power sector.

Energy Efficiency

76. **Energy efficiency is a critical element of the equation for meeting balance between supply and demand for electricity.** It has been estimated that cost-effective energy savings of at least 1% of electricity demand per year would be relatively easily attainable in Brazil. Such savings would make it possible to defer US\$300 million of investments in new generating capacity each year and would lead to reductions in carbon emissions of about 17 million tons over the next decade. The achievement of this energy efficiency target is being supported by a current World Bank operation (Loan 4514-0 BR). The operation will address some of the key barriers that prevent these benefits from being realized at present. These include lack of public awareness, absence of credible consumer information documenting energy savings, an underdeveloped Energy Service Company (ESCO) sector, and regulations and procurement practices that impeded the realization of potential savings in the public sector. An important step forward was the recent promulgation of the Energy Efficiency Law (No. 10297/01)

B. The Genesis of the Energy Crisis

77. **Against the backdrop of these major structural reforms, a crisis was gradually unfolding.** The hydrological situation in Brazil had been worsening continuously since 1997. The wet season in the year 2000 was one of the worst in the last 70 years so that by the time the new dry season began in April 2001, the average storage level of the country's reservoirs had reached a low point of 34% in the Southeast and 42% in the Northeast, compared with typical values of 80% for the end of the wet season. In May 2001, the Government officially declared a state of emergency in the power sector, and in July a rationing program was introduced limiting consumers in the South of the country to 80% of their historic consumption levels. The same policy was extended to the north of the country in September 2001. Although the worsening hydrological situation was the proximate cause of the crisis, this begs the question of why hydrological reserves were allowed to reach such low levels.

Causes of the Crisis

78. **According to the Government, the underlying cause of the crisis was the failure of planned new plants to come on stream in the year 2000.** According to the licensing records, an additional 7.8 GW of thermal generating capacity was scheduled to come on stream by 2001. If this amount of new capacity had become available, no power shortages

would have been experienced. However, in practice, hardly any of this new capacity materialized. About one-third of it experienced significant delays in reaching financial closure, while the other two thirds had to be cancelled altogether due to lack of investor interest. Given that the dispatch decisions taken by the NEWAVE model in 1999/00 were premised on the arrival of this additional plants, reservoir levels were allowed to fall much more rapidly than would have been justified under the circumstances, with a more realistic assessment of the likelihood that new generating capacity would come on line by the end of the year 2000.

79. There are basically two reasons why the planned new plants failed to come on stream. First, distributors had no incentive to contract for the new plants. Second, the structure of prices made it very difficult to finance new plants.

80. There were not adequate incentives for distributors to react to the impending supply shortage by contracting for new generation. Although generators and distributors were aware of the impending supply crisis, neither of them chose to react to the problem by trying to develop additional sources of power. Distributors technically had 100% of their load covered by long-term contracts with generators. They therefore had no incentive to contract for additional energy, since they would not be allowed to recover the associated costs from their customers. Indeed, if rationing occurred the distribution companies stood to receive financial compensation from generators (under ANEEL's Annex V) that would more than compensate for their decrease in revenues. Moreover, given that rationing is 'socialized' in Brazil, there was nothing to be gained by any individual distribution company taking measures to prevent it happening.

81. At the same time, there was no incentive for generators to build new plants. ANEEL's Annex V compensation provisions effectively put the responsibility for guaranteeing energy supply on the generators. However, the state-owned generators that continue to dominate the sector, simply refused to believe that the compensation clauses would ever be enforced; this was a prophecy that proved to be self-fulfilling. Moreover, neither was it financially attractive to build new plants. On the one hand, the level of ANEEL 'Valor Normativo' parameters relative to the true cost of building new plants meant that distributors would be unable to pay the prices that generators needed to cover the cost of their investments. On the other hand, the structure of prices and contracts made it virtually impossible to build merchant thermal plants. In a predominantly hydroelectric system, such plants would only be dispatched on an occasional basis when reservoir capacity was low. It would therefore have no way of covering the fixed costs of investment, and the dollarized take-or-pay gas contracts offered by Petrobras.

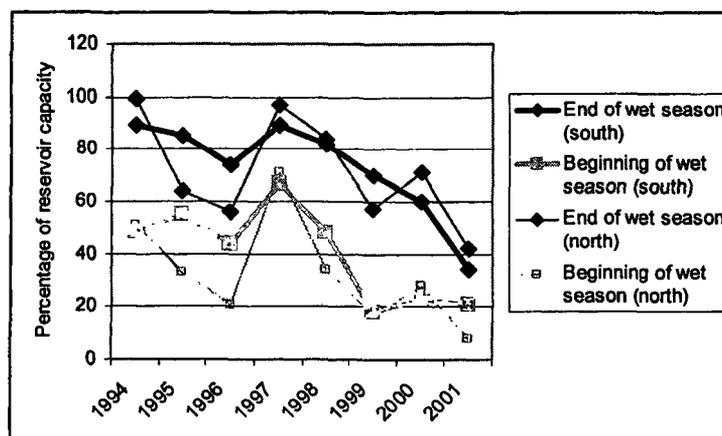
82. This fundamental lack of incentives for maintaining supply-demand balance will need to be addressed if future crises of this nature are to be avoided. This experience has revealed that neither ANEEL's Annex V provisions nor the stock market have provided the incentives to ensure that generators develop adequate reserve margins to ensure that energy demand could continue to be met in the face of a hydrological shock. International experience illustrates that a number of other mechanisms exist for providing these kind of incentives. One possibility is to increase the onus on distributors, by requiring them to contract for a higher percentage of their required load, and/or fining them for failure to

deliver energy to their consumers. Another possibility is to further restrict the amount of firm energy that hydroelectric generators can contract for a given level of capacity, and/or to introduce positive incentives for the development of merchant plants through a system of capacity payments to generators that make themselves available for dispatch, regardless of whether or not they are actually dispatched. Finally, demand-side bidding mechanisms have sometimes been used to maintain balance between supply and demand by allowing large industrial consumers to be compensated for voluntary reductions in load. The appropriate mix of policy measures for Brazil will need to be carefully evaluated. However, some combination of these measures needs to be introduced to rectify the underlying problem.

83. **In addition to these underlying causes, there were a considerable number of exacerbating factors that contributed to the severity of the crisis. Briefly, these were as follows:**

- A major drought that prevented the recovery of reservoirs to acceptable levels, so that the system was left with very low reserves.
- Poor coordination between government entities that delayed the policy response.
- Transmission bottlenecks that prevented sharing of the available energy across the various regional sub-markets.
- Under-valuation of the opportunity cost of water that led to excessive dispatch of hydroelectric plants.
- Delays and uncertainties in the process for environmental licensing of power sector projects.

Figure 5: The declining path of hydroelectric reserves



Source: Relatório da Comissão de Análise do Sistema Hidrotérmico de Energia Elétrica

84. **The level of reservoirs had been in continuous decline since 1997 following a series of years of below average rainfall.** The amount of rainfall that fell in each wet season since 1997 was consistently below the average. Rainfall in 2001 was around 50% of the long-run average in the South and Southeast and less than 20% of the average in the North and Northeast. As a result, reservoir levels both in the North and the South were in continuous

decline (Figure 5). At the *end* of the wet season in April 2001, they were about 34% of full capacity in the Southeast and 42% in the Northeast, which is less than they would typically hold at the *beginning* of the wet season, and compares with more typical values of 80% of capacity for the end of the wet season. By the end of the dry season in October 2001, reservoir levels had fallen to 21% of capacity in the Southeast and 8% in the Northeast, compared with more typical levels of 40% for the end of the dry season.

85. There is evidence that most, if not all, of the key players were aware of the gravity of the situation, long before emergency measures were taken. As early as the beginning of 1999, the MME was aware of an impending crisis situation and identified a number of countervailing measures including the construction of emergency thermal capacity. However, none of these measures were ever implemented, largely as a result of disagreements among MME, ANEEL, Eletrobras and Petrobras over the appropriate levels of remuneration for the new plants and the associated gas contracts. In addition, there is evidence that ONS, ANEEL and MME failed to adequately communicate the severity of the crisis to the highest levels of government, and that senior officials were not receptive to the early warnings that they received.

86. Although there was an overall power shortage in Brazil, some regional markets were nevertheless in surplus. Owing to regional variations in hydrological conditions, the 1999/00 drought did not affect all of the four sub-markets to the same degree. Indeed, while the Northeast and Southeast sub-markets were experiencing a shortage, there continued to be surplus generating capacity in the neighboring northern and southern sub-markets. Unfortunately, transmission bottlenecks between these sub-markets prevented the exploitation of this surplus capacity and thus contributed to the severity of the crisis.

87. Political influences exercised over the parameters of the NEWAVE model appear to have led to a systematic under-estimate of the opportunity cost of water. Due to the enduring vertical integration of Eletrobras subsidiaries, these effectively have a controlling influence on the governing body of the national system operator (ONS). The choice of technical parameters used to calculate the opportunity cost of water in the NEWAVE model was subject to political influence. A number of features of the model have been identified as responsible for this bias, and are listed below. The effect of this has been to create an unwarranted bias in favor of dispatching hydroelectric plants, thereby accelerating the decline of reservoir levels beyond what would be warranted by the underlying conditions. In effect, the political manipulation of model parameters became a way of postponing the need to face decisions about potential rationing.

- The cost of a power deficit is undervalued at R\$667/MWh (US\$250/MW), and moreover does not rise according to the magnitude of the deficit.
- The model assumes that new generating capacity that has been publicly announced will definitely come on stream, when in reality it often fails to do so.
- The model does not take into account the transmission bottlenecks that exist between regional sub-markets to an adequate degree.
- In evaluating alternative states of the world, the model algorithm does not embody the risk aversion that characterizes the preferences of policy-makers.

88. Finally, delays and uncertainties over environmental licensing procedures also contributed to the difficulty of developing new generation capacity. The inefficiencies of the environmental licensing system are an unlikely short-term cause of an energy crisis in a hydro-based (long lead-time) system. Nonetheless, delays in licensing projects and uncertainties with respect to requirements were often evoked during the course of the crisis as partly to blame for reluctant private sector participation. Suggestions have emerged, ranging from a possible centralization of the licensing system to the institution of special task forces to support state agencies in addressing ad-hoc critical cases.

Emergency Measures

89. The Government set-up a special high level committee to oversee the management of the energy crisis (GCE). The GCE, which convenes weekly, is coordinated by the President's Chief of Staff, and comprises key public and private sector representatives, including MME, ONS, MAE, MMA, National Social and Economic Development Bank (BNDES) and Eletrobras. The creation of this special committee undoubtedly signaled a weakening of MME authority in the sector. The decisions of the GCE are legally enforceable, taking precedence over those of ministries and regulatory agencies. Hence, the adoption of these measures by the GCE represents a binding public commitment. However, the GCE is only a temporary institution so that it appears that policy-making powers will revert to the MME once the crisis is over.

90. The first measure taken by the GCE was to ration the consumption of electricity to 80% of levels observed in the year 2000. The objective of the rationing was to prevent the kind of 'rolling blackouts' that have been experienced under similar circumstances, for example in California. Consumers who go above the 80% threshold, initially face financial penalties and were ultimately disconnected from the system. Initial reports suggested that the reduction in residential demand has been of the order of 24% exceeding the rationing targets, while the industrial sector has fallen short of the rationing targets achieving reductions of the order of 17%. Furthermore, there has been greater success in meeting rationing targets in the Southeast than in the Northeast. This is partly attributable to the lower baseline levels of consumption in the poorer Northeast region, which make it more difficult to find easy economies from cutting back on luxury power consumption, and in part to the warmer climate of the Northeast which leads to substantial power consumption for air conditioning. As a result, a series of three mandatory public holidays were introduced in the Northeast towards the end of October in an effort to curtail power consumption. With the advent of the rainy season, rationing was gradually relaxed and ultimately suspended at the end of February 2002.

91. Special measures were taken to minimize the social impact of rationing on low-income residential consumers. In order to prevent rationing from cutting into vital uses of electricity, households consuming less than 100 kWh per month were exempt from the requirement. Instead they were provided with financial incentives to reduce their consumption, by being credited with 2 free kilowatt-hours on next month's electricity bill for every kilowatt-hour saved this month. These measures were taken with a view to protecting low-income families who tend to consume modest amounts of electricity for essential needs such as basic lighting, water supply and food preservation.

92. **In addition, particular care was taken to minimize the economic impact of rationing on large industrial customers.** In order to provide large industrial customers with flexibility in meeting the rationing threshold, the GCE allowed them to trade quota rights among each other on a secondary market operated by the São Paulo Stock Exchange (BOVESPA). This mechanism made it possible for industries with a relatively low marginal productivity of energy to sell their quotas to those with a relatively high marginal productivity, thereby reducing the total economic cost of meeting a given level of rationing. Between June and December 2001, some 36.4 GWh have been traded on this exchange at an average price of US\$78 per MWh.

93. **In addition, the GCE has focused on contracting short-term emergency generation back-up.** Brazil entered the 2001-02 wet season with reservoir levels as low as 8% of capacity in the Northeast, and 21% in the Southeast. In order to avert the possibility of additional rationing next year, reservoir levels had to recover to about 50% of capacity during the course of the recent wet season. In fact, about 70% of capacity was reached. However, in case the rains had proved to be insufficient, prior to the rainy season the GCE tendered out the provision of (mainly barge-mounted) short-term emergency capacity, receiving offers for 4.7 GW of additional supply of which 2.2 GW were ultimately contracted. The possibility of paying large industrial consumers to further cutback their consumption in the event of further shortages was also explored. The costs of contracting short-term emergency generation will be recovered from customers in the form of a general mark-up on electricity tariffs, which could be up to 10% depending on the extent to which the emergency capacity is actually used.

Consequences of the Crisis

94. **The immediate consequence of the crisis has been to create a major financial liability for generators vis-à-vis distributors (US\$2.6 billion).** Under Annex 5 of the concession contracts, generators who are unable to supply the energy they have committed must compensate distributors by purchasing the energy shortfall, at the lesser of the spot market price or a predetermined cap of R\$200 per MWh (US\$74 per MWh). Owing to the 80% rationing provisions, generators were liable to compensate distributors for the 20% of their contracted energy that they had failed to supply. Given that spot market prices had reached three times the level of the cap, the compensation applicable was at the capped rate. However, even the cap was almost four times as high as the initial contract price, and as a result generators have defaulted on the Annex 5 compensation requirement leading to a major dispute with distributors. The GCE has estimated that the total amount owed by generators to distributors was of the order of R\$7 billion (US\$2.6 billion).

95. **The Annex 5 disputes coincided with the inauguration of the wholesale electricity market (MAE), and have prevented it from functioning effectively.** The advent of the energy crisis coincided with the phased introduction of the new electricity wholesale market. The implementation of the new wholesale trading arrangements was hampered from the outset owing to a major Annex 5 dispute between Furnas and the distribution utilities over the purchase of the energy to have been generated by the Angra II nuclear plant, which failed to come on stream in time. Although the Angra II reactor was built by Eletronuclear, the initial contracts allocated the plant to Furnas, which was therefore

held legally liable for the delay in the completion of this plant, even though it had no operational control over the project. Shortly thereafter, the rationing measures were introduced leading to the broader Annex 5 dispute between generators and distributors described above. As a result, there has not yet been any settlement of financial accounts between buyers and sellers in the wholesale market since September 2000.

96. **Furthermore, distribution companies have suffered major financial losses (US\$2 billion) from the lower sales imposed by government rationing.** Generators are not the only power companies to be adversely affected by the crisis. Distribution companies have seen their sales fall by 20%, as a result of government rationing and have claimed compensation. The total financial shortfall they will have experienced is estimated to amount to R\$5.6 billion (US\$2 billion). The Government has resolved this problem by allowing the distributors to borrow money from BNDES to cover 80% of these losses, and to repay the loans by means of authorized consumer tariff increases of the order of 5% for a period of three years. The tariff increases vary by customer class, being 2.9% for residential customers and 7.9% for other customer groups; low income customers are exempt from these tariff increases. In return, distributors have given-up the compensation that they are owed by generators under ANEEL's Annex V.

97. **Perhaps the only positive consequence of the crisis has been to highlight some of the deficiencies in the transitional arrangements and to generate the political will to complete the implementation of the original reforms.** In addition to its role as crisis manager, the GCE has made efforts to understand the underlying causes of the crisis and thereby to identify longer-term solutions that would prevent the repetition of such an episode. As most of the short-term measures have now been implemented, GCE is increasingly turning its attention to defining the longer-term reforms required to move the sector back onto a sustainable path. In January 2002, the GCE published a major 33 point action plan mandating major market and regulatory reforms designed to address the underlying causes of the energy crisis. Working groups have been established to work on each of the major issues and new regulations are underway in a number of key areas. Several of the measures in the GCE plan were incorporated into Law No. 10438/02, which was passed by Congress in February 2002.

V. THE PROPOSED LOAN

A. Program Objectives of the Proposed Loan

98. **The long-term objective of the power sector lending program will be to support the Government in realizing its original vision for the energy sector** (see Letter of Development Policy in Annex 1). The Government has clearly stated its overall policy objective of providing an efficient, reliable, universal and sustainable electricity service to its citizens. Moreover, the Government remains convinced that the way to achieve this is by completing the implementation of the original sector reform. This will entail a competitive, market-based sector with extensive private sector participation, supervised by an autonomous, transparent and consistent regulatory system, and complemented with clear obligations and incentives for the achievement of universal coverage.

99. **The proposed ESRL will contribute to the achievement of inter-locking sectoral and macroeconomic objectives.** The finance provided by the ESRL is not earmarked to the power sector, but will provide general budgetary support. Hence, at the macroeconomic level, the operation will contribute to financing the nominal public sector deficit and the US\$47 billion gross external financing requirements. About US\$5 billion of this total is expected to be met from public sector sources including multilateral disbursements, such as the proposed ESRL. At the sector level, this finance will support the Government's implementation of pricing reforms designed to address the underlying causes of the current energy crisis. In the longer term, the sectoral and macroeconomic objectives of the proposed operation interlock, since the policy reforms to be undertaken in the energy sector will help to promote economic growth thereby easing the external financing requirement.

100. **The proposed ESRL supports the Government's successful approach towards restoring the normal functioning of the electricity sector, while subsequent operations would aim to optimize the power sector model.** The transition to a new model left the power sector in a dysfunctional condition. The Government has addressed some of the associated issues, such as: reactivate the wholesale electricity market, raise tariffs towards a cost-recovery level, and strengthen incentives for reliable energy supply. One or more follow-up operations could focus on optimizing the sector model by addressing underlying structural problems. This will entail completing the vertical and horizontal break-up of electric utilities so as to provide the basis for effective competition, and perfecting the wider policy-making and regulatory framework. This program of support would include, but not be limited to, the ESTAL, expected to become effective toward the end of the proposed operation, thereby providing underlying continuity to the policy dialogue and following through with the implementation of the reform program. It has also been supported by the Public-Private Infrastructure Advisory Facility (PPIAF) which has focused on studies and workshops to sustain the Government's achievements. The three operations can be visualized in the following table:

Bank Support to the Brazilian Energy Sector		
ESRL	PPIAF	ESTAL
June 2001-May 2002	May 2002-December 2002	August 2002-December 2006
Implementation of first-level reforms in: <ul style="list-style-type: none"> • Market development and regulation • Environmental management • Access for the poor • Long-term planning • Institutional strengthening 	Studies for second-level reforms in: <ul style="list-style-type: none"> • Market development and regulation • Access for the poor Workshops with stakeholders to: <ul style="list-style-type: none"> • Discuss results of studies • Draw lessons from international experience • Build consensus 	Implementation of second-level reforms in: <ul style="list-style-type: none"> • Market development and regulation • Environmental management • Access of the poor • Long-term planning • Institutional strengthening

B. Reform Program Supported by the Bank

101. **The disbursement of the loan supports the Government's effective management during the last year and the implementation of first level reforms.** The loan of US\$454.55 million (including front-end fee of 1%) will be disbursed immediately upon effectiveness of the proposed ESRL. This reflects the achievements of the Government's Energy Crisis Management Chamber (GCE), which has been responsible for overseeing the national response to the crisis since April 2001. The main achievements of the GCE during the last year are summarized in Table 4 and described in greater detail below. They can be grouped into a number of areas. Many of these measures were adopted via Law 10438/02, which was passed by Congress in February 2002, and the rest have been mandated directly by the GCE.

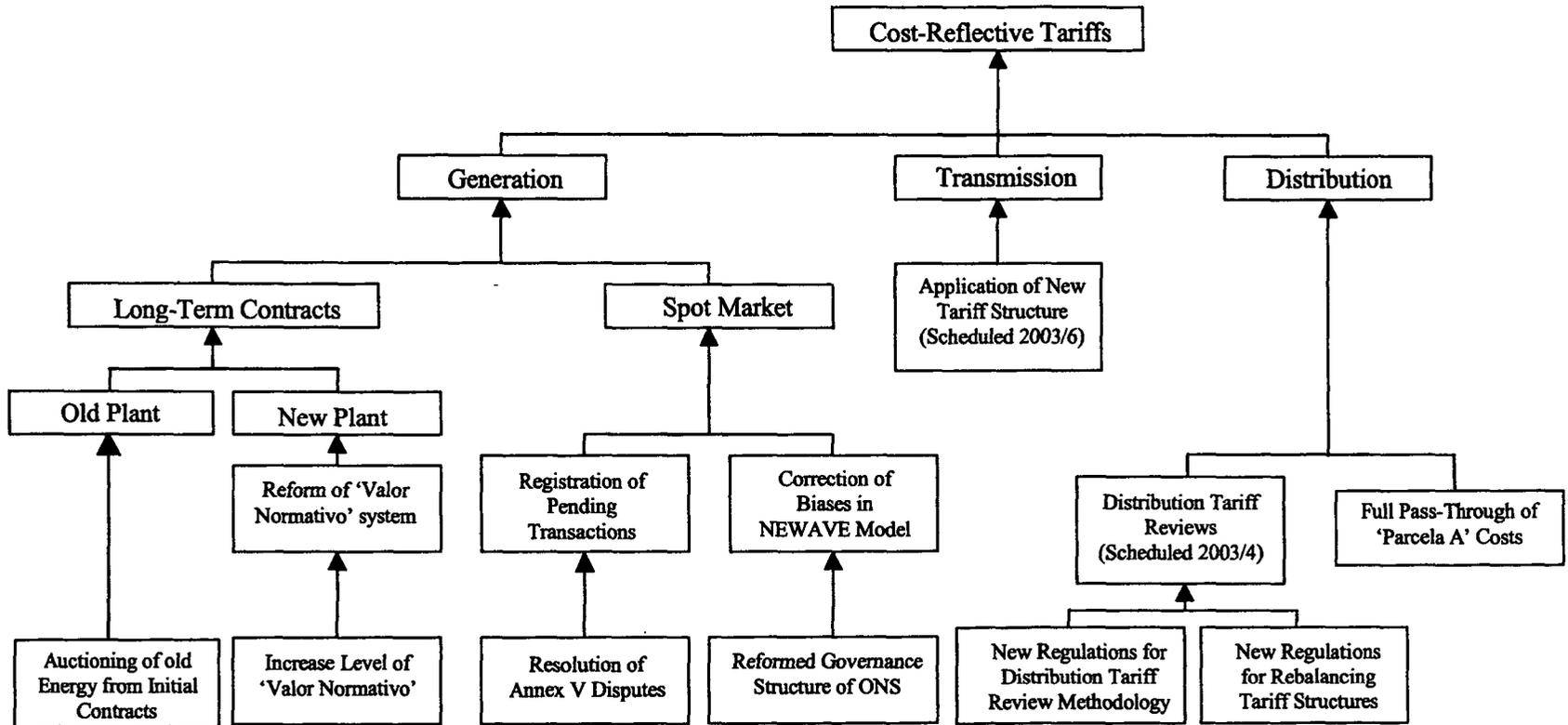
- First, the GCE has provided **effective management of the energy crisis**, minimizing its economic and social impacts and taking swift action to resolve the associated disputes and provide short-term emergency generating capacity (Conditions A-C).
- Second, the GCE has taken substantial **market reform** measures that will restore the normal functioning of the wholesale market, increase the competitiveness of the wholesale gas and power markets, and improve the governance of the system operator (Conditions D-H).
- Third, the GCE has made significant progress towards the **regulatory reform** measures required to correct underlying distortions in electricity distribution tariffs, and improving the reliability of energy supply (Conditions I-N).
- Fourth, the Government has approached its program in an **environmentally and socially sensitive** manner (Conditions O-S). This has entailed supporting the strengthening of the framework for the management of environmental and social issues, taking measures to safeguard affordable access to electricity by the urban and rural poor, and promoting energy efficiency and use of renewable energy sources.
- Finally, the GCE has promoted complementary **institutional reforms** to strengthen the policy-making capabilities of the Ministry of Mines and Energy (Condition T).

102. **The overall impact has been to restore tariffs for distribution, transmission and new generation to cost-recovery levels, and just as importantly sustain them at those levels in the face of future changes in economic conditions.** Hence some of the policy reforms focused on adjusting the current level of tariffs, while others focused on improving the efficacy and transparency of regulatory rules for adjusting tariffs to changes in costs over time. It is estimated that the immediate impact of these actions will be to raise the average end-user tariff by 20%. Figure 6 illustrates how the various actions contribute to the achievement of cost-reflective tariffs.

Table 4: Summary of Conditions

Effective management of the energy crisis	A. The Government's program for electricity rationing was successfully implemented with minimum social and economic impacts.
	B. The Government has contracted for 2 gigawatts (GW) of short-term emergency electricity generating capacity.
	C. The Government resolved the (US\$4.6 bn) financial disputes that arose as a result of the crisis involving electricity generation and distribution companies.
Market reform	D. The Government has taken significant steps towards improving the functioning of the electricity wholesale market (Law No. 10438/02).
	E. The Government has determined that sales of electricity produced by federal utilities will be carried out through public auction.
	F. The Government has mandated substantial improvements in the governance and operation of the system operator.
	G. The Government reformed the operation of the gas supply market to provide a greater diversity of supply options to downstream thermal generators.
	H. The Government has taken measures to prevent the abuse of vertical integration between generation, transmission and distribution.
Regulatory reform	I. The Government has established tracking accounts to ensure timely pass-through of 'Parcela A' costs incurred by distribution companies.
	J. The Government has taken significant steps towards improving the functioning of the 'Valor Normativo' system.
	K. The Government has mandated that regulations be issued requiring rebalancing of retail tariffs (Law No. 10438/02).
	L. The Government has mandated that new regulations will be issued detailing a comprehensive distribution price review methodology.
	M. The Government has mandated that transmission tariffs be revised to more accurately reflect geographical variations in cost.
	N. The Government has mandated that market players be provided with adequate incentives to maintain reliability of energy supplies.
Environmental and social issues	O. The Government has taken measures to improve the framework for management of environmental and social issues in the power sector.
Protection of the poor	P. The Government has established national eligibility rules for low income electricity tariff discounts (Law No. 10438/02).
	Q. The Government has established that there will be mandatory connection targets for electric utilities to reach universal access (Law No. 10438/02).
Energy efficiency and renewable energy	R. The Government has issued regulations to Law No. 10295/01 regarding energy efficiency standards and other related issues.
	S. The Government has established a program to create incentives for the development of renewable energy sources (Law No. 10438/02).
Institutional reform	T. CGE has decided that transmission tariffs be revised to reflect more accurately costs of transmission from different geographic locations.

Figure 6: Relationship between agreed actions and cost-reflective tariffs



103. **The measures supported by this operation form part of a medium-term program of optimization of the Brazilian energy sector.** The full reform program is laid out in the policy matrix to be found in Annex 2. Alongside each of the twenty measures (Conditions A-T), the matrix identifies any immediate follow-through actions that may be required to assure the full implementation of these reforms and the corresponding monitoring indicators. By the time each of these measures is fully implemented, the realization of the original power sector model will be largely complete. However, further optimization will be desirable in a number of key areas that are identified in the policy matrix and that may be supported by future adjustment operations as necessary. These include the following: (i) increasing reliance on market mechanisms for the determination of generation prices, by replacing the existing system of administratively determined spot prices and regulatory caps on power purchase cost pass-through; (ii) finalizing the vertical unbundling of the sector by divesting the major generation assets held (albeit under separate legal entities) by transmission and distribution companies; (iii) perfecting the framework for managing the environmental and social issues raised by power projects; (iv) completing the rural electrification process within the context of a coherent national strategy.

Effective Management of the Energy Crisis

104. **Condition A: The Government's program for electricity rationing was successfully implemented with minimum social and economic impacts.** The rationing program was successful in avoiding rolling blackouts, and included a number of innovative features. First, large industrial customers were given the flexibility to trade electricity consumption quotas on the São Paulo stock exchange, thereby making it possible to reduce electricity consumption at minimum economic cost. Second, small (primarily low-income) domestic consumers were exempted from the rationing requirement in order to ensure that essential electricity consumption was not jeopardized, but were given financial rewards for economizing on energy use.

105. **Condition B: The Government has contracted for 2 gigawatts (GW) of short-term emergency electricity generating capacity.** This reserve capacity will become available to the country, starting in 2002, as a safeguard against any continued shortages of hydroelectric energy that could arise before new long-term capacity comes on stream.

106. **Condition C: The Government resolved the (US\$4.6 bn) financial disputes that arose as a result of the crisis involving electricity generation and distribution companies.** Two major sets of financial disputes arose following the advent of the energy supply crisis and for some time paralyzed the normal operation of the sector. The first was a dispute between electricity generation and distribution companies, in an aggregate amount of about US\$2.6 billion equivalent, over the compensation that the former owed the latter under the Annex 5 provisions of the initial energy supply contracts. The second was a dispute between electricity distribution companies and ANEEL, in an aggregate amount of US\$2 billion equivalent, regarding reduction of revenues of such companies as a result of the fall in sales attributable to the rationing provision.

Market Reform

107. **Condition D: The Government has taken significant steps towards improving the functioning of the electricity wholesale market (Law No. 10438/02).** The following key measures have been taken. First, all transactions that took place in the electricity market since its inception in September 2000 until June 2001 have been registered; they had previously been paralyzed owing to the major financial dispute between generation and distribution companies mentioned above. Second, Law No. 10438/02 has implemented a new governance structure for the electricity wholesale market. The new structure serves to strengthen decision-making processes, increase regulatory oversight, and create arbitration mechanisms for solving disputes between participants. Third, the GCE has decided to develop proposals to establish mechanisms for de-linking the determination of electricity spot prices from the NEWAVE Model in the medium-term, and has created working groups to implement such proposals. This is particularly significant since it marks the beginning of a transition from centralized administrative dispatch to decentralized economic dispatch.

108. **Condition E: The Government has determined that sales of electricity produced by federal utilities will be carried out through public auction.** This decision of the GCE ensures that the federal energy utilities will not be in a position to abuse their market power in the power supply market when the initial contracts start to expire in 2003. It also provides a contract-based mechanism for privatizing the control of these generating assets.

109. **Condition F: The Government has mandated substantial improvements in the governance and operation of the system operator.** Two important decisions have been taken that will help to prevent a repetition of the dispatch decisions that contributed to the recent energy crisis. First, GCE has decided to modify the governance structure of the ONS. It will replace the current system (based on stakeholder representation), with an alternative system in which decisions are made by a small number of independent technical experts, who do not represent any of the commercial interests of the power sector. This will help to dilute the influence of the Eletrobras subsidiaries in the decision-making processes of the system operator. Furthermore, the NEWAVE Model has been revised (GCE Resolution No. 109) so that it provides a more accurate estimate of the opportunity cost of water, which is the key parameter governing dispatch in a predominantly hydroelectric system.

110. **Condition G: The Government reformed the operation of the gas supply market to provide a greater diversity of supply options to downstream thermal generators.** The inflexibility of Petrobras take-or-pay gas supply contracts, has been one of the factors preventing new thermal generation projects from reaching financial closure. In order to permit alternative risk-sharing arrangements between the gas supply and generating sector, Petrobras has begun to offer a wider menu of contractual options (such as linear pricing schemes, or two-part tariff schemes incorporating capacity and energy charges), and has already negotiated at least one flexible supply contract. The ANP also announced the first round of auctions for new pipeline capacity on existing rights of way on October 1st, 2001. This will help to stimulate the development of competition in gas transportation, thereby reducing costs and accelerating network expansion.

111. **Condition H: The Government has taken measures to prevent the abuse of vertical integration between generation, transmission and distribution.** In order for the new power sector model to function effectively, it is necessary to complete the process of vertical unbundling; separating out generation, transmission and distribution activities. This will entail a substantial program of asset sales, which would be difficult to implement against the backdrop of the current energy crisis, and impossible to complete within the life of the current operation. Therefore, the Government's council for privatization has decided (via Resolution No. 35/01), to create separate legal entities to be respectively responsible for the electricity generation and transmission activities presently under the responsibility of the three main federal utilities (CHESF, FURNAS, and ELETRONORTE). Furthermore, the GCE has decided to revise the existing regulations regarding limitations by any company which generates and distributes electricity, on the use of the electricity it generates for purposes of its own electricity distribution activities. A working group has been created to carry out such revision.

Regulatory Reform

112. **Condition I: The Government has established tracking accounts to ensure timely pass-through of 'Parcela A' costs incurred by distribution companies.** This measure was taken via Medida Provisoria No. 2198-5 (August 24th 2001) and Portaria Interministerial No. 296/01. It addressed the concerns of distribution companies that had not been allowed to pass on to their customers changes in a timely fashion any changes in exogenous costs that were permitted under the terms of their respective concession contracts.

113. **Condition J: The Government has taken significant steps towards improving the functioning of the 'Valor Normativo' system.** The 'Valor Normativo' for pass-through of energy purchase costs has been a major obstacle to new investment in electricity generation. The Government is taking short, medium and long-term measures to improve the functioning of this system. First, the 'valor normativo' for new gas-fired power generation plants has been increased by 20 percent in real terms (ANEEL Resolution No. 256/01) to better reflect the full economic costs. Second, ANEEL has issued regulations (Resolutions Nos. 022/01 and 256/01) merging all of the technology specific 'valores normativos' into a single cap and improving the transparency of the rules for adjusting this value over time as market conditions change. Third, CGE has decided to formulate proposals for medium-term alternatives to the 'valor normativo' based on market mechanisms, and has created a working group to implement such proposals.

114. **Condition K: The Government has mandated that regulations be issued requiring rebalancing of retail tariffs (Law No. 10438/02).** These regulations will ensure that the tariff structure for electricity distribution services more accurately reflects the cost differentials between residential and industrial customers, starting from the next distribution price reviews scheduled for 2003-04. As well as improving the equity and efficiency of distribution pricing, the tariff re-balancing will help to ensure that large industrial customers (with more than 3MW of installed capacity) face the correct incentives for engaging in the direct purchase of energy from generators.

115. Condition L: The Government has mandated that new regulations will be issued detailing a comprehensive distribution price review methodology. These regulations will include a description of the procedures to be used for determining the X factor, benchmarking company performance, estimating the Weighted Average Cost of Capital, and valuing the regulatory asset base. They will serve to ensure that there is a detailed, defensible, predictable and transparent methodology for revising tariffs, well in advance of the 56 distribution tariff reviews scheduled in 2003-04. This will go some considerable way towards reducing the regulatory risk currently faced by distribution companies, and enhancing the confidence of investors in the regulatory system. In parallel, the Government will establish regulatory accounting guidelines for distribution utilities, to ensure that there is a consistent and objective information base to support tariff revisions. GCE has created the working groups to implement these changes.

116. Condition M: The Government has mandated that transmission tariffs be revised to more accurately reflect geographical variations in cost. It is important that transmission tariffs provide signals to generators of the economic cost of locating at different points on the transmission network. At present, such price signals are weak. The new tariff structure will better reflect geographical variations in tariffs.

117. Condition N: The Government has mandated that market players be provided with adequate incentives to maintain reliability of energy supplies. During the recent energy crisis, neither generators nor distributors faced credible incentives to maintain the reliability of energy supplies. In order to avoid a repetition of this scenario, the GCE will ensure that such incentives are provided through the introduction of new regulatory and market mechanisms, including an appropriate package of incentives for safeguarding the reliability of energy supplies. The GCE is studying the suitability of a range of alternative mechanisms to the Brazilian context. These include higher contracting obligations on distributors, fines on distributors for failure to supply energy to customers, revision of the firm energy parameters governing the contracting of hydroelectric energy, introduction of capacity payments for plants that make themselves available for dispatch, and demand-side bidding.

Environmental and Social Issues

118. Condition O: The Government has taken measures to improve the framework for management of environmental and social issues in the power sector. The transition to a new power sector model, and in particular the changing role of Eletrobras, has raised problems of coordination between the different regulatory agencies responsible for power, water resources, and environmental issues. In order to address these problems, the MME and MMA signed a Memorandum of Understanding in March 2002. On this basis, the Government has prepared a program to strengthen planning and management of environmental and social issues in the power sector, comprising the following measures: (i) review and adjustment, as needed, of environmental licensing requirements, procedures, and mandates for power sector projects; (ii) assessment of the performance of power sector regulatory agencies to clarify their institutional roles and coordination requirements vis-à-vis other government entities, such as the Ministry of Environment, the National Water Agency, and the Ministry of Mines and Energy; (iii) revision and realignment of key institutions with regard to mandates and procedures for mainstreaming

environmental and social issues in longer-term expansion planning, including coordination with water resources management and environmental agencies; (iv) carrying out a set of studies on priority topics including project preparation methodologies, strategic assessment of longer-term system expansion paths, river basin inventories, strategic assessment of the thermal power program, issues and options relating to potential participation of the sector in markets for carbon emissions and other environmental services, and promotion of corporate responsibility; (v) strengthening (number and qualification) of professional cadres within the power and environment sectors, with special emphasis on the environmental capacity in regions/states where expansion of the sector is likely to be concentrated over the coming years; and (vi) strengthening of monitoring and ex-post evaluation of environmental and social issues in the power sector. This program is detailed in Annex 4 and will be supported by the proposed ESTAL.

Protection of the Poor

119. **Condition P: The Government has established national eligibility rules for low income electricity tariff discounts (Law No. 10438/02).** To replace the wide range of discretionary practice by distribution companies regarding low income tariff discounts, Law No. 10438/02 establishes that such discounts will be provided to all customers consuming less than 80 kilowatt-hours per month (excluding second homes). Discounts may also be provided to customers in the 80-220 kilowatt-hour range may also be provided if customers meet certain additional eligibility rules to be determined on a national basis by ANEEL. The electricity regulator will also specify how distribution utilities may recover the loss in revenues entailed by low income tariff discounts.

120. **Condition Q: The Government has established that there will be mandatory connection targets for electric utilities to reach universal access (Law No. 10438/02).** With the authority of Law 10438/02, ANEEL will determine the specific connection targets for each distribution utility, to ensure that power is brought to Brazil's 3 million un-electrified households within a reasonable time horizon (between two and ten years depending on the State). In order to resolve some of the inconsistencies and contradictions in the current approach to rural electrification, the Government has already made substantial progress towards publishing a national strategy for rural electrification. The new strategy will establish the appropriate financial, technological and institutional models for meeting these connection targets in an efficient, equitable and sustainable manner. In addition, the Government will issue new regulations establishing the price and quality parameters for off-grid electrification, and determining the rules for off-grid sub-concessions. Development of the national strategy is being supported by an Energy Sector Management Assistance Programme (ESMAP) Grant.

Energy Efficiency and Renewable Energy

121. **Condition R: The Government has issued regulations to Law No. 10295/01 regarding energy efficiency standards and other related issues.** The law requires the establishment of mandatory minimum performance levels for electric appliances and equipment commercialized in Brazil, as well as the introduction of mechanisms to promote energy efficiency in new buildings. The new regulations provide energy efficiency standards for certain

common types of electrical equipment including motors, lamps, refrigerators, freezers, air conditioners, and water heaters, together with benchmarks for future improvements in the energy efficiency of each appliance, and a labeling scheme to help consumers identify energy efficient brands.

122. **Condition S: The Government has established a program to create incentives for the development of renewable energy sources (Law No. 10438/02).** The law introduces a new program designed to provide incentives for the development of renewable sources of electricity generation, with a primary focus on small hydro, wind and biomass (mostly sugar cane bagasse).

Institutional Reform

123. **Condition T: The Government has started studies to restructure the Ministry of Mines and Energy (MME).** The limited capacity of the MME to meet key policy-making and environmental planning activities in the energy sector and thereby takeover the role originally played by Eletrobras has been a key institutional concern arising from the sector reform process. The GCE has mandated a major restructuring of the MME that entails both the reorganization of the internal directorates so that they are better aligned with the needs of the sector, as well as an expansion and enhancement of the human resources available to the Ministry.

C. Description of Financial Assistance

Phasing of the Operation

124. **The proposed ESRL is not an isolated operation.** It has been conceived as an initial element within the context of a program of support to accompany further reforms in the Brazilian energy sector. However, it has not been structured as a programmatic loan because of the Presidential elections in October 2002. A multi-year adjustment operation would be inappropriate at this time, since it would entail the current administration making commitments on behalf of the future administration.

125. **Thereafter, the ESTAL operation will provide the basis for on-going dialogue and support the institutions responsible for following through with the medium-term reform program.** A new three-year ESTAL operation is expected to be presented to the Board shortly after this ESRL. By overlapping with the proposed adjustment operation, and providing a bridge between the current administration and the next, the TA loan will ensure the longer-term continuity of the policy dialogue. It will also provide a basis for direct engagement with the key sectoral institutions responsible for following-through with the next stage of the reform program, thereby supporting the achievement of the longer term policy objectives. The Technical Assistance package will be channeled primarily towards MME, ANEEL and ANP, but will also benefit MMA and ANA.

126. **Policy dialogue will resume with the new administration in order to identify the most appropriate form for follow-up support.** As noted above, while the proposed operation will of itself bring substantial benefits by correcting the numerous tariff distortions that are currently preventing investments in the Brazilian power sector, further structural reforms will be

required if the potential of the original power reform is to be fully realized. The structural reform agenda has been clearly identified in the preceding analysis, and would be supported in the next phase of the program. These will be the subject of renewed policy dialogue once the new administration is in place.

Relationship to Other Bank Activities

127. The World Bank has been active in the Brazilian energy sector for some time. Since the early 1990s, the World Bank has had a number of energy sector operations in Brazil, primarily focused on the development of the hydrocarbons sector (Table 6). Although for various political and macroeconomic reasons it did not prove possible to have a specific operation linked to the power sector reform process, a restructuring of Loan 3376-BR in 1995 allowed for the incorporation of a US\$20 million component of Technical Assistance to support the power sector reforms. Hence the World Bank was actively engaged with this process. At present, the only active operation in the sector is the Energy Efficiency Project (Loan 4514-0-BR) which aims to demonstrate replicable energy efficiency improvements across a variety of sectors, and support the development of energy efficiency standards and energy service companies.

128. The IFC has resumed its operations in the Brazilian energy sector following a three year hiatus. Due to excessive institutional exposure to Brazil, the IFC stopped preparing new operations in Brazil during the period 1998 to 2001. Activities have recently resumed, and a number of significant new projects are currently under preparation (Table 6). The IFC is focusing its strategy on supporting distribution utilities in the Northeast, where substantial efficiency improvements stand to be made. It is also supporting the development of gas-fired generation, some of which is expected to act as merchant plant as a result of negotiating more flexible gas purchase contracts from Petrobras. The IFC is also interested in the development of relatively small hydropower projects. A full list of IBRD and IFC operations in Brazil is provided in Annexes 5 and 6.

129. The Inter-American Development Bank also has a significant energy sector portfolio in Brazil. The overall focus of the IDB program is on consolidating sector reform, promoting rural electrification, developing renewable energy sources, mobilizing resources for private sector generation, and working on the integration of energy markets (Table 6). Through its public sector window, the IDB is currently focusing on technical assistance activities to support rural electrification, and the development of regulatory capacity. On the private sector side, the IDB is supporting a significant number of hydroelectric and thermal generation projects.

Table 6: Summary of recent World Bank, IFC and IDB energy sector operations

	Project	Board Date	Status
World Bank	Hydrocarbon Transport and Processing Project (Loan 3376-BR)	1992	Completed and rated Satisfactory
	Gas Sector Development Project: Bolivia-Brazil Gas Pipeline (SCL-42650)	1997	Completed and rated Highly Satisfactory
	São Paulo Natural Gas Distribution Project (Loan 3403-BR)	1998	Completed and rated Satisfactory
	Energy Efficiency Project (Loan 4514-0-BR)	1999	Under Supervision
IFC	C-AA-Guilman Amorim 200 MW Hydroelectric Plant	1997	Currently disbursing
	C-AG-Northeast Distribution Utilities	2001	Under preparation
	C-AE-Small Hydroelectric Power Generation	2002	Under preparation
	C-AC-Gas Generation	2002	Under preparation
IDB	<u>Private sector</u>		
	BR-0271 Ita Hydroelectric Power Project	1997	
	BR-0316 North Energy	1999	
	BR-0346 VBC Partial Risk Guarantee	1999	
	BR-0304 Cana Brava Hydroelectric Power Project	2000	
	BR-0315 Dona Francisca Power Project	2000	
	BR-0354 Termobahia Power Project	2001	
	BR-0361 Termopernambuco Power Project	2001	
	<u>Public sector</u>		
	CT-FOMIN Business Models for Renewable Energy Projects under the PRODEEM Program		
CT-FOMIN Technical Training of Regulators from ANEEL and ANP			

130. **The proposed ESRL is fully consistent with the CAS 2000, and fits into the broader strategy of adjustment lending.** The Brazil CAS 2000, which was approved by the Board on March 30, 2000, envisages an important role for adjustment lending to support effective and continuing structural reforms addressing the key objectives of fiscal stability and renewed growth, while at the same time contributing to financing Brazil's considerable external financing requirements. Within the envelope of the CAS ceilings, these adjustment loans include the proposed ESRL, as well as a Second Programmatic Financial Sector Adjustment Loan and a possibly future Second Programmatic Fiscal Adjustment Loan. Consistent with the CAS, the Bank's response to the energy crisis combines the proposed ESRL—designed to help implement key changes in the regulatory framework necessary to attract further private investment—with a Technical Assistance operation to provide longer term support to the key agencies responsible for implementing these changes.

131. **Since late 1998, Brazil has been supported by a three-year IMF program focused around targets for the primary surplus of the consolidated public sector.** These and other program targets have been consistently achieved and in several cases exceeded. In September 2001, the IMF approved a new 15-month stand-by agreement. Through the IMF's quarterly

program reviews and the ongoing close consultation between the Bank and the IMF, satisfactory macroeconomic performance is assured throughout the life of the proposed operation.

Disbursement, Auditing and Fiduciary Environment

132. **The Loan would disburse under the Bank's provisions for fast-disbursing operations, which require no procurement of goods and services.** The flow of proceeds would follow procedures established under the prior programmatic Fiscal Reform structural adjustment loan. The Bank may require audits of the account into which the proceeds of the loan will be disbursed.

133. **As discussed in some detail in the 2001 CAS Progress Report, reviewed by the Board on May 24, 2001, Brazil has a supportive fiduciary environment for the proposed operation.** Furthermore, the Government is engaged in a process of strengthening its expenditure review, financial management, and auditing functions. Moreover, the Bank has recently stepped-up its support for further improvements in the fiduciary framework in Brazil advancing on the shift from transaction-based fiduciary oversight to systemic support:

- The Federal Government has over the last years consolidated effective and transparent expenditure planning, budgeting and financial management systems. These systems include multi-annual planning (Plano Pluriannual), strategic budget planning, the annual law of budget guidelines, and the budget law itself. The monitoring and evaluation system of the Plano Pluriannual constitutes a framework for gradually institutionalizing public expenditure reviews that are built into the regular planning and budgeting cycle.
- The Bank has completed a Country Financial Accountability Assessment (CFAA), and the Fund has undertaken a fiscal transparency assessment. The CFAA includes a review of the systems and procedures used at the national level to budget, expend, account for, report on, and audit the use of funds approved in their annual budget. The assessment shows the overall satisfactory financial management framework and makes specific recommendations for further improvements. It concludes that, overall, at the national level, Brazil has in place appropriate financial management systems.
- In specific areas, the Bank also supports Governments in their procurement systems. Regarding Bank-financed projects in general, the Brasilia-based implementation team continues to support and underpin high standards with respect to financial management, procurement and accountability.
- A Country Procurement Assessment (CPA) has recently been initiated to complement similar work recently undertaken with good impact at the state level.

D. Environment

134. **The project has no direct or indirect adverse environmental or social impacts, since it focuses on legal, regulatory and institutional reforms.** Moreover, being an adjustment operation, the project provides general budget support as opposed to financing specific power

sector investments. Proceeds of the loan are integrated into the reserves of the Central Bank. The loan is not used for investments or other budget expenditures in the power sector or any other sector. Furthermore there are no indirect impacts on the power sector's budget as a result of possible fungibility of resources across public sector budgets as explained in Annex 4. A C rating has therefore been given.

135. Nonetheless, the program of which this project is a part, and which includes the proposed ESTAL, offers an opportunity to strengthen the general framework both for management of environmental and social issues in the power sector and for environmental licensing of power sector projects in Brazil. The program will address concerns that have arisen with respect to the efficiency of the current licensing system in the course of the reform process and to strengthen the mainstreaming of environmental and social issues in future power sector operations, especially with regard to decisions that pertain to the early stages of the project cycle. Therefore a proactive, strategic approach has been taken, which integrates within the Bank-supported adjustment program itself the design of a series of measures to address regulatory, institutional and methodological concerns.

136. The activities to be supported by the ESTAL will focus on revisiting and updating as needed the overall framework of environmental regulation and management, as the basis to ensure effective environmental procedures in managing specific power projects and ensuring the sustainability of future sector expansion. The two operations complement each other in supporting preparation of a program comprising the following key elements, as described in Annex 4: (i) review and adjustment, as needed, of environmental licensing requirements, procedures, and mandates for power sector projects; (ii) revision of mandates and procedures and realignment of key institutions with regard to mainstreaming environmental issues in medium-long-term planning and improved coordination with water resources management and environmental agencies; (iii) carrying out a set of studies on priority topics including: project preparation methodologies; strategic assessment of longer-term system expansion paths; river basin inventories; strategic assessment of the thermal power program; issues and options relating to potential participation of the sector in markets for carbon emissions and other environmental services; and promotion of corporate responsibility; (iv) strengthening (number and qualification) of professional cadres within the power and environment sectors, with special emphasis on the environmental capacity in regions/states where expansion of the sector is likely to be concentrated over the coming years; and (v) strengthening of monitoring and ex-post evaluation of environmental and social issues in the power sector.

137. As currently envisaged, full development of the strengthening program itself would be undertaken in stages, with consultations/validation carried out at each major stage (e.g., diagnostic, preliminary design and overview of program priorities, formulation of a multi-year strategy, formulation of the first phase action plan). This program would be implemented in the medium-term (4-8 years), possibly supported by the Bank through subsequent operations, including the ESTAL .

E. Benefits

138. The program will enhance economic growth prospects by rectifying the problems that continue to afflict the power sector. Electricity is a key input into most production processes, hence serious problems in the power sector affect overall economic performance. The proposed program will address the various problems that are currently preventing the power sector from making its necessary contribution to economic growth. In the short-run, this means restoring the normal functioning of the power sector so as to remove the shortages that are currently holding back economic activity. In the medium-term, it entails creating incentives for the construction of new (thermal) generating plants by the private sector, by correcting the existing distortions in the electricity pricing regime, so that tariffs can converge to cost-recovery levels. In the longer run, it requires the full implementation of the original power sector reform model, including restructuring of the power sector to provide the basis for effective competition. These reforms will increase the efficiency of the power sector, which will in turn improve the competitiveness of the Brazilian economy.

139. As well as contributing to poverty reduction via economic growth, the program will address the specific needs of the poor for access to an affordable electricity service. In urban areas, the proposed operation will support the development of an objective, consistent and effective eligibility criterion for targeting low income tariff discounts towards the poor. In rural areas, the operation will require the development of a coherent strategy for reaching universal access, including the incorporation of mandatory connection targets for distribution utilities.

140. The program will also address issues of longer term sustainability, optimal natural resource use and management of environmental and social impacts in power sector expansion. The loan will strengthen the mainstreaming of environmental and social issues in the early stages of the project cycle, strategic decision making with regard to thermal and hydropower expansion, and improvement of the environmental licensing process (requirements, procedures and mandates).

Table 7: Summary of benefits

Objectives	Outcome Indicators	Poverty Impact and Indicators
Restoration of normal functioning of the electricity sector.	<ul style="list-style-type: none"> • Lifting of electricity rationing. • Normal functioning of the electricity wholesale market. 	<ul style="list-style-type: none"> • Electricity shortages no longer holding back economic growth.
Creation of incentives for new private sector investment in new (thermal) generating capacity.	<ul style="list-style-type: none"> • Achievement of cost-recovery electricity tariffs. • Modification of regulatory regime to ensure that prices remain at cost-reflective levels. <ul style="list-style-type: none"> ➢ Valor Normativo rules ➢ Dispatch model rules ➢ Distribution review method • Provision of incentives for reliable energy supplies • Improved transparency and timeliness of environmental regulation procedures. • Development of new (thermal) generating plants by the private sector. 	<ul style="list-style-type: none"> • Prevention of future energy crises, thereby avoiding adverse shocks to economic growth.
Full implementation of original power sector reform model.	<ul style="list-style-type: none"> • Completion of structural reforms of the sector, including full vertical unbundling, horizontal break-up and privatization of remaining state-owned assets. • Correction of defects in the institutional and regulatory framework arising from the transition to the new model (including environmental planning and licensing issues). 	<ul style="list-style-type: none"> • Electricity produced at efficient costs, thereby enhancing productivity and economic growth.
Universal access to affordable electricity services.	<ul style="list-style-type: none"> • Introduction of consistent and well-targeted eligibility rules for low-income tariff discounts in urban areas. • Introduction of mandatory rural electrification targets for each state distribution utility. 	<ul style="list-style-type: none"> • Percentage of poor electricity consumers benefiting from low-income tariff discounts • Cost of subsistence electricity consumption as a percentage of the income of an urban household on the poverty line. • Percentage of poor rural households with access to electricity
Improved management of environmental and social issues in power sector operations.	<ul style="list-style-type: none"> • Timely licensing of power sector projects. • Environmental and social concerns mainstreamed in power sector expansion plans and projects. 	<ul style="list-style-type: none"> • Resettlement and other social impacts associated with future power sector operations reduced or mitigated.

F. Risks and Risk Mitigation

Macroeconomic Risks

141. **Brazil remains vulnerable to external shocks due to the level and composition of its public debt.** Brazil's level of public debt remains above 50% of GDP. Moreover, this debt is predominantly indexed (either to the SELIC or the US dollar) creating volatility in the cash flow of the public sector. As a result, the economy remains vulnerable to external shocks. Nonetheless, under very plausible assumptions, public debt to GDP ratios are expected to begin a gradual decline as primary balance surpluses are maintained. On the external front, the current account balance deficits should maintain their downward trend to ensure that external debt remains sustainable and that the country's financing requirements are aligned with the different sources of external funds. The major short run risks are related to market uncertainty regarding the elections outcomes. Macroeconomic risks are greatly ameliorated by the credibility built-up by the Government through three years of effective macroeconomic and fiscal management in the face of severe external shocks. Even in a scenario with further macroeconomic shocks, sector performance is expected to be improved compared to a situation without the reforms supported by this loan.

142. **Further macroeconomic shocks would also complicate the implementation of the proposed energy sector reforms, particularly in the medium-term.** The proposed operation, by stimulating economic growth, will have positive macroeconomic consequences by helping to improve the sustainability of the public debt. However, it is important to question how the energy sector reform program would itself be affected by future macroeconomic shocks. There are a number of important linkages, two of them negative and one positive. First, any increase in country risk premium will raise the cost of capital for private investors reducing the flow of foreign direct investment in the Brazilian power sector, and lowering interest in any further privatizations that are likely to be required in the medium-term. This would not affect the current operation, which does not entail any privatization measures, but would affect subsequent operations under this program. Second, any further devaluation of the *real* will necessitate compensating adjustments in energy prices to ensure that the private sector is adequately remunerated for past investments. Third, any dampening of aggregate demand would reduce future investment needs, facilitating restoration of the balance between supply and demand.

Risk of Weakening Reform Consensus

143. **The new administration could take a different view about the appropriate long-term policy response.** The long-term vision described in this document is that of the current administration, and may not be shared by a future government. It is also possible that opposition may emerge at the State level. Precisely for this reason, the proposed operation has been designed as a self-contained short-term operation to ensure that the key tariff reforms take place within the life of the current administration. It will thereby bring significant benefits to the power sector, irrespective of whether the next administration is willing to commit to the longer term program of structural reforms. In addition, the proposed Technical Assistance operation will help to support the key policy-making and regulatory agencies in following-through with the

implementation of the reform program. It is also important to note that the reform program is likely to carry the support of foreign investors who have collectively committed US\$22 billion to the Brazilian power sector to date.

144. While falling short of its full potential, the reforms supported by this loan would have made an important contribution to sector improvement even if the next Government decides not to pursue some of the envisaged medium to long-term reforms.

Risk of Institutional Weakness

145. **The leadership in the current energy crisis is coming from an ad hoc temporary committee, the GCE, which is expected to disband with the close of the current administration.** Although the sector has its own permanent policy-making bodies, notably MME and CNPE, they are notoriously weak in technical capacity and have been identified by GCE as partially responsible for the present situation. In order to address this concern, the proposed Technical Assistance operation will aim to strengthen the institutional basis of policy-making in the sector.

VI. RECOMMENDATION

146. I am satisfied that the proposed Loan would comply with the Articles of Agreement of the Bank, and recommend that the Executive Directors approve it.

James D. Wolfensohn
President

By: Shengman Zhang

Washington D.C.

May 17, 2002

ANNEX 1: LETTER OF DEVELOPMENT POLICY



PRESIDÊNCIA DA REPÚBLICA CÂMARA DE GESTÃO DA CRISE DE ENERGIA ELÉTRICA

Ofício nº 032/2002 - GCE/PR

Brasília - DF, 6 May, 2002

To
Mr. James D. Wolfensohn
President
The World Bank
Washington, DC - USA

Dear Mr. Wolfensohn,

This letter on sector policy addresses Brazil's progress towards the implementation of its energy sector reform program, including mechanisms to address related social and environmental issues. An efficient energy sector is a key ingredient to foster economic growth and the improvement of living standards. We believe the policies outlined below are important government initiatives to be supported by the Bank through an Energy Sector Reform adjustment operation.

2. The Government's long term objective for the energy sector is to provide universal access to reliable, sustainable and efficient electricity services, that pay due regard to the environment. The government intends to achieve this objective by opening-up the energy sector (including power generation and upstream gas supply) to effective competition and promoting an efficient participation of the private sector in the operation of the existing infrastructure and in the development of new capacity. In order to function effectively, it has to be complemented by effective government institutions. In particular, it requires a well-resourced and expert body to provide strategic policy guidance, autonomous regulatory agencies that can be held accountable for taking transparent, and consistent decisions, and an impartial system operator to ensure the efficient utilization of generating capacity.

3. Brazil started a broad power sector reform process in 1995. Tariffs were realigned early on, and more than two thirds of the distribution assets and one fourth of generation assets have since been privatized. New regulatory and operating institutions were created: two private bodies, Operador Nacional do Sistema - ONS, the national system operator, and the wholesale energy market, Mercado Atacadista de Energia - MAE, now govern energy and cash flows, while a new regulatory agency (Agência Nacional de Energia Elétrica - ANEEL) was created to supervise the electricity sector. Reforms in the upstream gas market were also undertaken. These reforms comprised inter alia the creation of a regulatory agency (Agência Nacional do Petróleo - ANP) and the end of the legal monopoly of Petróbras over the sale and production of oil. An agency to regulate the different uses of water resources—that play an important role in electricity generation in Brazil—was also created (Agência Nacional de Águas - ANA).

A handwritten signature in dark ink, appearing to be the name of the official representing the Presidency of the Republic of Brazil.

4. **More recently, Brazil has successfully dealt with a major energy crisis.** Brazil is a country with a power system that is predominantly hydroelectric and, as such, it is dependent on the hydrologic conditions of its main water basins. The hydrology was very atypical in 2001, with very little rain in the wet season and, in the Northeast region, the worst drought in seven decades. In response to an imminent shortage of power, the Government introduced a rationing program in June 2001 limiting most consumers to an average of 80% of their historic consumption levels. This program was based mainly on price incentives to firms and households, with the threat of selective cuts. In the event, the response of the population to this program was such that these cuts turned out to be very rare and blackouts were avoided throughout the dry season.

5. **Despite the reduction of more than 20% in total electricity consumption, the disruption of economic activity was limited.** This resulted from allowing large industrial customers to trade consumption rights among each other on a secondary market operated by the São Paulo Stock Exchange (BOVESPA). This mechanism made it possible for industries with a relatively low marginal productivity of energy to sell their quotas to those with a relatively high marginal productivity, thereby reducing the total economic cost of meeting a given level of rationing. The success of these auctions led to a quick spreading of other exchanges, resulting that, on balance, most of the deceleration of the economy in 2001 can be attributed to demand factors, including the worsening of the international environment, due to terrorism and economic difficulties in neighbor countries, rather than to the direct effects of the shortage of energy. A positive side effect was an overall increased productivity, as a result of the measures taken to reduce power consumption.

6. **The rationing program was accompanied by a strengthening of the social safety net.** In order to prevent rationing from cutting into vital uses of electricity, hospitals, police, fire stations and other services received special treatment. In addition, households consuming less than 100 kWh per month were required to save relatively less, and were instead provided with financial incentives to reduce their consumption. The response of these households to the price incentives contributed to the overall savings, while allowing them to reap a financial benefit.

7. **The government also adopted measures to reduce the risk of rationing in 2002.** It procured 2154 MW of short-term emergency capacity starting this year. The acquisition of this "insurance policy" followed clear and transparent procedures through a well publicized bidding process and the joint work of federal, state and local environmental authorities to ensure the adequate licensing of these power units.

8. **The events of 2001 brought to the forefront the importance of accelerating and strengthening the implementation of the reform initiated in 1995.** To steer the reform impetus, the government set up the Committee for the Revitalization of the Model, which is under the Chamber to Address the Energy Crisis (GCE) created at the onset of the crisis. The Committee is charting the key changes to the sector to be implemented in 2002 and beyond and has produced specific proposals made public in two Progress Reports released by the government in early 2002. It created several task forces that are now detailing those proposals in consultation with the agents and society at large. Ahead of the implementation of those specific proposals, the government has already taken several steps toward the reform and regularization of the sector.

9. **A first step towards ensuring the well functioning of the sector was the solution of pending regulatory issues, including those associated with the rationing.** The reduction in the production of energy in 2001 led to cash flow problems and potential economic losses to



generators and distributors. Contract clauses between these agents, as well as other agreements signed by their representatives within the MAE, resulted in an important disparity of views about who would bear the cost of the rationing, including how much of it would be passed through to consumers. To address this problem and foster the functioning of the power sector, the government helped generators and distributors to find common ground. The resulting "General Agreement for the Sector" reduced the overall bill to less than half of initial estimates and spread the pass through to consumers over a number of years—henceforth reducing the impact on industries and households, while shielding low income households from the resulting tariff increase. The agreement also allowed BNDES to provide liquidity to distributors by offering loans guaranteed by the tariff increase. Importantly, participants of the agreement accepted to drop any court action related to the rationing and the interpretation of the original contracts.

10. **Agreement was reached also with generators and distributors that solved all grievances covering the period between the auctioning of the concessions and the end of 2001.** The government established a robust mechanism to insulate distributors from changes in the cost of "non-manageable" costs, such as purchased thermal energy from the reserve capacity (CCC) and hydro energy from Itaipu hydro power plant. Under the previous legislation, variations in these costs were taken into account once a year, at the time of the tariff calculation, when they were passed through to the consumer. Depending on the way these variations take place, this mechanism might, however, provide only a partial hedging. To improve this hedging, the government has passed legislation that creates a tracking account, where variations in "non-manageable" costs from January 2001 are credited or debited. This resulted in all parties involved renouncing any claim and dropping any court actions involving past demands related to items now included in the tracking account.

11. **These measures, effective from end 2001, have been ratified by Congress in April.** The General Agreement of the Sector, as well as the rules governing the purchase of emergency capacity, were incorporated to Medida Provisória No. 14, covering several other reform items. This Medida Provisória, which was converted into Law No. 10438 on April 26, 2002, is a watershed in the reform process.

12. **The law gives prominence to universal access and the use of energy from renewable sources.** The law establishes responsibilities and funds for the delimitation of expanding areas where universal access is to be ensured through mandatory connection targets for distribution companies. The law also ratifies the creation of PROINFA, which directs funds for building more than 1,000 MW of renewable sources such as wind and small hydro power, as well as biomass. This initial program is to be followed by other steps with a view to allow that 10% of total energy comes from these sources within 20 years.

13. **The government has insisted that environment responsibility includes fostering efficiency in the use of energy.** Hence, the government is taking a range of policy measures designed to save at least 1% of electricity demand each year, including an Energy Efficiency Law (No. 10295/01), that has been accompanied by a decree establishing technical groups, which are already discussing mandatory minimum performance levels for electric appliances and equipment with the industry and other stakeholders. The government is also working on legal changes to allow government institutions to contract with energy service companies (ESCOS) and ensuring financial support training of technicians proficient in efficiency and renewable energy technologies throughout the country.



14. **Following the schedule drawn by the Revitalization Committee, measures in several other areas are to be implemented in the next few months. These actions will be based on discussions and studies already underway and will address key issues such as (i) getting generation and distribution prices right, with a view to increase competition and accountability in the sector; (ii) improving the reliability of energy supply and the access to gas, to allow for the latter to be competitive; (iii) separating generation, transmission, and distribution activities; (iv) enhancing the performance and coordination of agencies; and (v) increasing the protection of the environment and the poorest.**

15. **In a bold, albeit carefully-considered move, the government envisages to give market participants a greater role in the determination of energy prices. A move towards a decentralized bid-based dispatch model may avoid the risks associated with relying mainly on a single mathematical model, as is the rule today. This move, however, has to avert the build up of market power and other distortions, while ensuring the reliability of the system and its efficient operation. Incentive compatible mechanisms are thus being discussed within the government and with agents. The effective implementation of such plans will require inter alia the adequate definition of property rights of water—both among hydro plant operators and with respect to other users, an issue also under discussion with the help of ANA.**

16. **The auctioning out of the energy under the control of state-owned firms will, in turn, help finding new pass-through mechanisms. Law No. 10438 mandates the public auction of the electricity generated by federally controlled utilities, which account for more than one third of total supply of electricity in the country. This sale will provide market-based indication of the true competitive price of energy, allowing an overhauling of the existing formula-based reference value limiting the pass-through of the cost of power purchase. In addition the so-called 'Valor Normativos'—VN, which reflect the "standard" cost of each different sources of energy will be unified to reflect that competitive value and cost differentials between energy sources will be explicitly subsidized according to transparent policies.**

17. **All measures envisaged by the government take into account that the power market liberalization in Brazil is not occurring in an environment of excess supply. This is in contrast with, for instance, Europe, where excess capacity ensures that the spot price remains close to US\$ 20/MWh. It means that the restructuring of the sector, while addressing issues of competition, has to ensure new investments. These competing priorities underlie many of the challenges faced by the implementation of the reform to date, but are not unique to Brazil. For instance, in order to help lower the cost of energy, while fostering investment, the Government is, for instance, reforming the gas supply market to provide a greater diversity of supply options to downstream thermal generators.**

18. **The evolving policy for gas recognizes the importance to reconcile macro and micro economic factors in the development of thermal power. Currently, the VN for thermal power is around US\$ 40/MWh, but has failed to ensure a steady flow of investment into this industry. In fact, the inflexibility of existing take-or-pay gas supply contracts requires a high VN to allow thermal plants to break even, and ultimately price this source of energy out (no distribution company signed a supply contract at that VN). Hence, the government is instead fostering the emergence of new suppliers, and attempting to integrate thermal electricity within other uses of gas in order to render this source of energy truly competitive. A first step in this direction is the first round of auctions for new pipeline capacity on existing rights of way already under way.**

19. **The unbundling of generation and transmission activities is another cornerstone of the reforms.** The generation, transmission and distribution activities of Furnas, Chesf, and Eletronorte will be completely unbundled by the middle of the year, and the corporate structure of these enterprises overhauled. As of 2002, all integrated enterprises will also be required to separate out their accounts, with a clear distinction of assets and liabilities related to each activity. Another leg of this approach to promote a level playing field will be to require reducing the threshold for self-dealing by distributors.

20. **Several dozen of distribution tariff reviews scheduled for 2003 will bring additional transparency to the sector.** Despite the special circumstances present in 2001, ANEEL successfully conducted the periodic tariff review of an important distributor last year. Although not setting definite benchmarks, this review served as a testing ground for the methodology to be adopted in future reviews and reflected comments from the sector. The outcome of the review and the adjustments made in the initial methodology in light of comments were published in a technical note made available at the web site of ANEEL. The agency plans to issue definite regulations well in advance of the 56 distribution tariff reviews scheduled for 2003/4. In parallel, the Government is establishing regulatory accounting guidelines for distribution utilities, to ensure that there is a consistent and objective information base to support tariff revisions.

21. **Institutional issues are also being addressed.** The new regulatory and oversight framework created as part of the reform process have experienced teething pains. In particular, self regulation of the wholesale market proved dysfunctional. This market of differences has not been able to settle any transactions since its inception in September 2000, leading ANEEL to intervene and change its governance. Since then, there has been a reduction in the backlog of pending transactions, with the registering of accounts for the period up to June 2001. The government has initiated a reform of the ministry in charge of electricity.

22. **The government is addressing the top issues about coordination of efforts and clarification of jurisdictions between policy makers and regulators, both on the economic and environmental side.** An important step towards this is the overhauling of the Ministry of Mines and Energy, since, with privatization, the government sector has lost a critical mass of technical experts to support the development and implementation of energy policy, and a strengthened structure is needed to fulfill the government policy-making functions. Another step forward has been the presence of the leadership of ANEEL, ANP and ANA at the executive committee of the GCE, which is also improving the coordination between these agencies, laying down a path to an increased institutional cooperation between them.

23. **The coordination between agencies in the area of the environment is also improving.** The government has an unshakable commitment to environmental sustainability. For some years, Brazil has had a sound framework of environmental regulation, and the Ministries of Mines and Energy (MME) and the Environment (MMA) have stepped up their cooperation, with the signing in 2002 of a framework agreement to cooperate in areas of common interest. There has also been a consistent effort to review environmental licensing requirements, procedures and mandates.

24. **Finally, a comprehensive policy for low-income tariffs is being developed, contributing to the government efforts to protect the poorest.** The government intends to introduce a set of principles and eligibility rules for low income tariff discounts that will protect poor consumers in urban areas. These rules are to be designed to make benefits more targeted and

capture the actual social status of consumers. It is noteworthy that, by increasing the efficiency of the sector, the reforms in the electricity sector will in different ways help improving standards of living of the population as whole. To the extent of their contribution to higher economic growth, they can help lift thousands of people out of poverty and create jobs.

25. To support the carrying out of the program, the Brazilian Government has initiated conversations with the Bank seeking its support to a technical assistance project. This project will help to develop a medium-term cooperation in addressing issues such as those surrounding the regulatory system and the wholesale and retail markets, improved access to power by the poor, the sector's environmental framework, as well as the long-term expansion planning for the sector and the capacity of the Government in policymaking and implementation in the energy sector.

The Government remains firmly committed to its program of reforms as outlined above and would welcome your prompt consideration of an Energy Sector Reform Loan in support of the measures that have been implemented and those under implementation. We look forward to continue working together with the Bank on future adjustment loans regarding the reform of the energy sector.

Yours sincerely,



PEDRO PULLEN PARENTE

Chief of Staff of the Presidency

Head of the Câmara de Gestão da Crise da Energia Elétrica

ANNEX 2: BRAZIL: ENERGY SECTOR ADJUSTMENT OPERATION – ACTIONS INDICATORS AND GOALS

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	<i>Actions Completed</i>	Expected Follow-Through	Monitoring Indicators	Elements of Future Reforms	Program Objectives
Effective Management of the Energy Crisis	A. The Government's program for electricity rationing was successfully implemented with minimum social and economic impacts.		Termination of electricity rationing.		Resolve immediate crisis.
	B. The Government has contracted for 2GW of short-term emergency electricity generating capacity.		Installation of new capacity.		Provide short-term reserve capacity.
	C. The Government resolved the financial disputes that arose from the energy crisis: a) between generators and distributors for US\$2.6 billion; b) between distributors and ANEEL for US\$2 billion;		Acceptance of decisions by parties involved.		Resolve disputes created by crisis.
Market Reform	D. The Government has taken significant steps towards improving the functioning of the electricity wholesale market. a) All transactions between September 2000-June 2001 have been registered. b) A new governance structure for the market has been implemented (Law No. 10438/02). c) Working groups have been established to de-link spot prices from NEWAVE model.	Complete settlement of all registered transactions. Publish proposed new method for spot price determination.	Registration and settlement of transactions. Establishment of new wholesale market governance structure. Publication of proposed new method.	Implementation of new method for spot price determination.	Optimize functioning of wholesale power market.
	E. The Government has determined that sales of electricity produced by federal utilities will be carried out through public auctions.	Conduct auctions on a regular basis	Volume of power sales auctioned.		Improve competitiveness of wholesale market.

	<i>Actions Completed</i>	Expected Follow-Through	Monitoring Indicators	Elements of Future Reforms	Program Objectives
	<p>F. The Government has mandated substantial improvements to the system operator.</p> <p>a) Current stakeholder board replaced by non-stakeholder board to improve governance.</p> <p>b) Revised NEWAVE model to better reflect the opportunity cost of water.</p>	Implement new governance model.	<p>Non-stakeholder board appointed.</p> <p>Revised NEWAVE model operational.</p>		Improve transparency and impartiality of system operator.
	<p>G. The Government reformed the operation of the gas supply market.</p> <p>a) Petrobras negotiated first flexible gas supply contract with power generator.</p> <p>b) ANP announced first round of auctions for new gas pipeline capacity.</p>	<p>Institutionalize flexible gas supply contracts.</p> <p>Execute auctions for new gas pipeline capacity.</p>	<p>More flexible contracts negotiated.</p> <p>Auctions held on a regular basis.</p>		Increase competitiveness of gas supply market.
	<p>H. The Government has taken measures to prevent abuse of vertical integration.</p> <p>a) Creation of separate legal entities for generation and transmission assets of CHESF, FURNAS and ELETRONORTE.</p> <p>b) GCE mandated new regulations limiting self-dealing of power by vertically integrated electricity distributors.</p>	Issue new regulations.	<p>Separate companies for generation and transmission</p> <p>Reduced volume of self-dealing in the wholesale power market.</p>	Divest generation assets of federal utilities.	Increase competitiveness of wholesale power market

	<i>Actions Completed</i>	Expected Follow-Through	Monitoring Indicators	Elements of Future Reforms	Program Objectives
Regulatory Reform	I. The Government has established tracking accounts to ensure timely pass-through of 'Parcela A' costs beyond control of distributors.		Regulations issued and enforced.		Maintain cost-reflective distribution tariffs.
	J. The Government has taken significant steps to improve functioning of 'Valor Normativo.' a) Raised VN for new gas-fired power plants by 20 percent. b) Revised regulations for VN to better reflect cost of electricity generation. c) Decided to formulate proposals for market-based alternatives to VN.	Publish proposed market-based alternatives to VN.	Level of VN relative to true cost of generation. Revised regulations issued and enforced. Publication of proposed alternative.	Implementation of new market-based alternative to VN.	Maintain cost-reflective distribution tariffs.
	K. The Government has mandated that regulations be issued rebalancing retail tariffs between residential and industrial customers.	Issue and enforce regulations rebalancing distribution tariffs.	Regulations issued. No. of distribution companies applying rebalanced tariffs.		Maintain cost-reflective distribution tariffs.
	L. The Government has mandated new regulations detailing a comprehensive distribution price review methodology.	Issue and enforce regulations for distribution price review.	Regulations issued. No. of reviews completed following new methodology.		Maintain cost-reflective distribution tariffs.
	M. The Government has mandated that transmission tariffs be revised to better reflect geographical variations in cost.	Issue and enforce regulations for transmission prices.	Regulations issued. No. of transmission companies applying new tariffs.		
	N. The Government has mandated that market players be provided with adequate incentives to maintain reliability of energy supplies.	Issue and enforce regulations regarding improved reliability.	Regulations issued and enforced. Availability of firm energy relative to peak demand.		Ensure reliability of energy supply.

	<i>Actions Completed</i>	<i>Expected Follow-Through</i>	<i>Monitoring Indicators</i>	<i>Elements of Future Reforms</i>	<i>Program Objectives</i>
Environmental and Social Issues	<p>O. The Government has taken measures to improve the framework for management of environmental and social issues in the power sector.</p> <p>a) Completed a diagnostic review of environmental licensing requirements, procedures, and mandates.</p> <p>b) Signed MoU between MME and MMA and agreed TOR for a program to strengthen planning and management of selected issues in the power sector.</p>	<p>Publish diagnostic review.</p> <p>Execute proposed program.</p>	<p>Publication of diagnostic review.</p> <p>Publication of results of the program studies.</p>	Implementation of the results of the program studies.	Minimize environmental and social impacts of power sector.
Protection of the Poor	<p>P. The Government has established national eligibility rules for low income electricity tariff discounts (Law No. 10438/02).</p> <p>Q. The Government has established that there will be mandatory connection targets for electric utilities to reach universal access, in the context of a coherent national rural electrification strategy.</p>	<p>Incorporate new rules into tariffs and billing procedures.</p> <p>Determine company specific targets.</p> <p>Publish rural strategy.</p>	<p>Lower prices to lower income households.</p> <p>Achievement of coverage targets.</p> <p>Publication of rural strategy.</p>	Implementation of new rural electrification strategy.	<p>Provide affordable electricity to the poor.</p> <p>Attain universal access to electricity.</p>
Energy Efficiency and Renewable Energy	<p>R. The Government has issued regulations to Law No. 10295/01 regarding energy efficiency standards and related issues.</p> <p>S. The Government has established a program to create incentives for the development of renewable energy sources (Law No. 10438/02).</p>	<p>Develop strategy for disseminating and incorporating new standards.</p> <p>Develop strategy for implementation.</p>	<p>Percentage of equipment sales that comply with new standards.</p> <p>Percentage of new generating capacity that is renewable.</p>		<p>Improve efficiency of energy use.</p> <p>Provide incentives for renewable energy.</p>
Institutional Reform	T. The Government has determined the restructuring of the Ministry of Mines and Energy to strengthen its capacity in policy-making and environmental planning.	Training and institutional strengthening via ESTAL.	No. of staff working on energy policy. Publication/dissemination of policy directives and environmental plans.		Create effective policy-making institutions.

ANNEX 3: BRAZIL'S ENERGY SECTOR: BACKGROUND INFORMATION

Table A3.1: Summary of state of privatization and unbundling of the power sector

	Original Ownership	Original Activities	Production Scale	Year of Unbundling	New Companies	Year of Sale	Main Buyer
<i>FEDERAL</i>							
CHESF	ELETROBRAS	G T D	10418 MW	None		None	
ELETRONORTE	ELETROBRAS	G T D	4885 MW 643 MW 99 MW 12 TWh 6TWh 0.2 TWh	1999 1999	ELETRONORTE Manáus Energia Boa Vista Energia	None 1999 1999	ELETRONORTE ELETRONORTE
ELETROSUL	ELETROBRAS	G T	3688 MW	1998	GERASUL ELETROSUL Transmissão	1998 None	TRACTEBEL
ESCELSA	ELETROBRAS	G D	171 MW 5 TWh	None	ESCELSA	1995	IVEN/GTD
FURNAS	ELETROBRAS	G T	9502 MW	None		None	
LIGHT	ELETROBRAS	G T D	832 MW 24 TWh	None		1996	EDF
<i>State</i>							
ELETROACRE	Acre	G D	28 MW 0.3 TWh	Yes?	ELETROACRE	#	ELETROBRAS ELETROACRE
CEAL	Alagoas	D	2 TWh	None	CEAL	#	ELETROBRAS
CEA	Amapá	G D	34 MW 0.4 TWh	None		None	
CEAM	Amazonas	G D	150 MW 1 GWh	Yes?		2000	ELETROBRAS
COELBA	Bahia	D	9 TWh	None	COELBA	1997	IBERDROLA
COELCE	Ceará	D	6 TWh	None	COELCE	1998	ENDESA
CELG	Goiás	G D	658 MW 18 MW 5 TWh	1997	CDSA CELG CELG	1997 None None	ENDESA
CEMAR	Maranhão	D	2 TWh	None	CEMAR	2000	Pennsilvania. P & L
ENERSUL	Mato Grosso	G D	123 MW 3 TWh	None	ENERSUL	1997	ESCELSA
CEMAT	Mato Grosso	G D	104 MW 3 TWh	None	CEMAT	1997	REDE
CELPA	Pará	G D	90 MW 3 TWh	None	CELPA	1998	REDE

	Original Ownership	Original Activities	Production Scale	Year of Unbundling	New Companies	Year of Sale	Main Buyer
State cont.							
Saelpa	Paraíba	D	2 TWh	None	Saelpa	2000	CFLCL
CELPE	Pernambuco	D	7 TWh	None	CELPE	2000	IBERDROLA
CEPISA	Piauí	D	1.3 TWh	None	CEPISA	#	ELETRONBRAS
CERJ	Rio de Janeiro	G D	60 MW 6 TWh	None	CERJ	1996	ENDESA/EDP
COSERN	Rio Grande N.	D	3 TWh	None	COSERN	1997	COELBA
CEEE-RGS	Rio Grande S	G	906 MW	1997	CEEE-RGS	no	ELETRONBRAS
		T	487 MW		CGTEE	no	
		D	7 TWh		CEEE-RGS	no	
		D	5 TWh 7 TWh		RGE AES - Sul	1997 1997	VBC AES
CERON	Rondônia	G	109 MW	None	CERON	#	ELETRONBRAS
		D	1.1 TWh				
CER	Roraima	G	22 MW	None		None	
		D	0.04 TWh				
Eletropaulo	São Paulo	G	1397 MW	1998	EMAE	None	
		T			CTEEP	None	
		D	35 TWh 22 TWh		Eletropaulo Metropolitana EBE (Bandeirante)	1998 1998		AES EDP
CESP	São Paulo	G	7623 MW 2643 MW 2322 MW	1997	CESP Paraná	None	AES DUKE
		T			TIETÊ CGEEP	1999 1999	
		D	11 TWh		EPTE ELEKTRO	None 1998	ENRON
CPFL	São Paulo	G	148 MW	None	CPFL	1997	VBC
		D	19 TWh				
ENERGIPE	Sergipe	D	2 TWh	None	ENERGIPE	1997	CFLCL
Municipal							
CELB	Campina Grande	D	0.5 TWh	None	CELB	1999	CFLCL
Private							
CELTINS	Grupo REDE	G		None			
		D	0.6 TWh				
CFLCL	Cataguazes- Leopoldina	G	18 MW	None			
		D	0.9 TWh				
CAJUA	Grupo REDE	D	0.8 TWh	None			

Eletrobras acquired control of these small utilities between 1997 and 2000 with the intention of improving their performance for future privatization.

Table A3.2: Summary of power sector institutional framework

	Brief description
ANEEL	<p>ANEEL was created in 1996 as the federal regulatory agency for the electricity sector. The agency is governed by a five person directorate, appointed directly by the President, with the approval of the Senate, but without the involvement of the MME. The internal structure of ANEEL is comparatively complex, with 20 different superintendencies each dealing with a specific area.</p> <p>ANEEL's responsibilities include:</p> <ul style="list-style-type: none"> • issuing regulations to support the implementation of new legislation; awarding concessions to sector operators; • supervision of concession contracts; revision of tariffs; • monitoring of service quality; • dealing with customer complaints; • certifying the firm energy of hydroelectric plants; • designing hydroelectric inventories to optimize river flows; • modeling stream flow in the transmission network; and • overseeing the operation of the wholesale market. <p>ANEEL is allowed to delegate some of its functions to state utility regulators, where these exist, however this has not yet happened to any significant degree due to the absence of suitably qualified counterparts in many states.</p> <p>ANEEL monitors the physical implementation of environmental and social programs associated to power sector projects. From a technical and normative perspective, responsibility for ensuring compliance with mitigation/compensation plans rests with the licensing agency.</p>
ANP	<p>ANP was created in 1997 as federal regulatory agency for the hydrocarbons sector. Similar to ANEEL, ANP is headed by a five person directorate appointed directly by the President, with the approval of the Senate. The internal structure of the ANP comprises nineteen Superintendencies, with responsibilities for specific areas, totaling 400 staff.</p> <p>ANP's principal functions include:</p> <ul style="list-style-type: none"> • implementing national policy for the hydrocarbons; • awarding and supervising concessions for exploration, development and production; • issuing authorizations for refining, processing, transporting and trading activities; • defining tariffs for pipeline transportation; • protecting consumer interests; • organizing and maintaining technical records of the oil and gas sector; • regulating the dissemination of new technical data; • supervising compliance with oil products and gas conservation measures; and • supporting land expropriation procedures associated with project development. <p>Given the important linkages between the gas and electricity markets, there has been some discussion as to whether ANP and ANEEL should be merged, however this possibility is no longer under consideration.</p>

	Brief Description
GCE	<p>The GCE is a special high level committee that was created in 2001 as a temporary body to manage the national response to the energy crisis. It is coordinated by the President's Chief of Staff, and comprises key public and private sector representatives, including MME, MMA, ONS, MAE, BNDES and Eletrobras. The creation of this special committee signals the limitations of MME to deal with a crisis situation.</p>
CCPE	<p>The CCPE, established in 1999, with responsibility for sectoral planning. The committee is presided by the energy secretary and incorporates a wide representation including Petrobras and Eletrobras, ONS, a selection of generation, transmission and distribution companies, as well as a number of industry associations.</p> <p>The committee, functions through a number of technical sub-committees, of which one (CTSA) focuses on environmental and social studies. CCPE is responsible for producing 10 year expansion plans for the generation and transmission sectors. In the case of the generation sector, the plans are only indicative in nature; hence investors are not required to select projects from the list or implement them in the sequence proposed. The CCPE has faced major difficulties in recruiting the technical staff needed to support the planning process.</p>
CNPE	<p>The CNPE was created in 1997 in order to advise the President on matters relating to energy policy, and to formulate guidelines for the rational utilization of energy resources. It is composed of a steering committee with 10 members comprising seven Ministers of State, the President's Chief of Staff, a representative of the State governments, an academic specialist and a private citizen. The committee meets once every six months, or whenever necessary. The CNPE has no technical staff of its own, but rather relies on the Secretariat of Energy at the MME. Among its eight Technical Committees, one is the Environment Committee.</p>
MAE	<p>A key feature of the reform process was the introduction of an wholesale electricity market (MAE), based on an agreement between the key sector stakeholders. The MAE began to operate in September 2000. Major decisions relating to the MAE are taken by the General Assembly, where 50% of the votes are allocated to consumers and 50% to producers.</p> <p>The supervision of the MAE was originally the responsibility of an executive committee (COEX), whose members were elected directly by the General Assembly. Following initial problems—relating mainly to the decision-making process, the lack of full-time dedicated committee members, and the lack of progress in resolving the disputes that have been paralyzing the MAE—ANEEL intervened to replace the COEX with an advisory committee (COMAE); comprising six counselors, two nominated by the generators, two by the distributors and two by ANEEL.</p> <p>The day-to-day operation of the MAE is supervised by CAMAE, while the settlement of accounts is performed by the Brazilian financial clearing house (CBLC).</p>

	Brief description
MME	<p>The Ministry of Mines and Energy is responsible for activities related to the exploration and exploitation of natural resources, including mines and hydroelectric resources, and those related to the transformation and distribution of mineral and energy products.</p> <p>Within the MME, the Secretary General is responsible for internal coordination and external liaison. While the Secretary for Energy and the Secretary for Mines and Metallurgy have jurisdiction over each respective area. The Energy Secretariat is subdivided between the Energy Policy Department and the Energy Development Department. The Energy Secretary also supervises the two federal energy companies (PETROBRAS and ELETROBRAS) and the two independent energy regulators (ANP and ANEEL).</p> <p>The main responsibilities of the Secretary of Energy are as follows:</p> <ul style="list-style-type: none"> • to provide guidelines for the development of national energy policy; • to advise government on improving the environmental performance of the energy sector; • to provide strategic coordination for energy sector development plans; • to promote and coordinate the collection and recording of hydrological data; • to promote research and development in the energy sector; • to foster and coordinate the development of new and renewable energy resources; • to provide technical and administrative support to CNPE, and to coordinate the CCPE; • to maintain national energy production and consumption records; and • to coordinate international integration of the energy sector.
ONS	<p>ONS was created by the sector reform law in 1998, as a private entity charged with conducting the dispatch of all generating plants larger than 50 MW connected to the national grid, and coordinating the operation of the interconnected system which comprises all transmission lines in excess of 230kV. The dispatch decisions of ONS must be consistent with the conditions embodied in each plants environmental license.</p> <p>The objective of ONS is to minimize the generation costs of meeting any given level of demand on the system, and to ensure non-discriminatory access to the transmission network for all players. It also provides advisory input to CCPE on the presence of transmission constraints in the national grid.</p> <p>The decision-making body of the ONS is the General Assembly, which comprises representatives of the generation (43%), transmission (14%) and free consumer sectors (43%), each with the voting shares indicated.</p>

Table A3.3: Summary of power sector legal framework

	Brief summary
Law 8031/90	<p>Creates the National Privatization Program, involving all federal assets, under BNDES coordination.</p> <p>The law has been complemented by the following regulations:</p> <ul style="list-style-type: none"> • Decree 572/92 incorporated LIGHT and ESCELSA into the Program; and • Decree 1503 incorporated the remainder of the ELETROBRAS group into the Program.
Law 8631/93	<p>The law is primarily concerned with revising power sector tariffs to pave the way for subsequent sector reforms. The main dispositions are as follows:</p> <ul style="list-style-type: none"> • eliminates the policy of single uniform national tariffs; • retracts guaranteed rate of return for power companies of 10% of the asset base; • eliminates the compensation fund (CRC) which allowed the transfer of resources to finance the cross-subsidies between companies implied by the single national tariff; • obliges distribution utilities to enter into long-term (10 years) contracts with the regional (federal) generators, at tariffs defined by the regulator; • requires distribution utilities to create consumer commissions to supervise the quality of services; and • regulates the CCC (Conta de Consumo de Combustíveis) a compensation fund that covers the additional fuel cost of some existing plants using oil products and national coal.
Law 9074/95	<p>The law is primarily concerned with creating conditions conducive to competition. The main dispositions of the law are as followed:</p> <ul style="list-style-type: none"> • foresees the creation of an independent regulator (ANEEL); • regulates concessions, authorizations and permissions for electricity services; • defines the basic rules for the extension and extinction of concessions then in force; • foresees the creation of an independent system operator (ONS); • creates independent power producers and free consumers; • establishes principle of free access to all transmission and distribution networks; • defines the concept of the Basic Network, and allocates responsibility for its expansion to the respective concessionaires on the basis of publicly tendered contracts; and • requires new hydro generation to be developed according to the "optimal design" defined by the regulator. <p>The law has been complemented by the following regulations:</p> <ul style="list-style-type: none"> • Decree 2003/96 which establishes the rules for free-consumers, self-producers and Independent Power Projects; and • Decree 1717/95 which defines the Basic Network and conditions for extending existing concessions and requires accounting separation of generation, transmission and distribution activities.
Law 9887/95	<p>Regulates Article 175 of the Federal Constitution, which requires concessions for public service to be competitively tendered. Allowable criteria for bid evaluation include least price, maximum premium or a combination of both.</p>
Law 9427/96	<p>Creates ANEEL and establishes that it will be financed by a supervision tax of 0.5% on the revenue of all power utilities. Simultaneously, it ruled that the RGR should be reduced from 3.0% to 2.5% of the utilities revenue.</p>
Law 9678/97	<p>Creates CNPE and ANP and defines national energy policy.</p>

	Brief summary.
Law 9648/98	<p>This is the central piece of legislation for the Brazilian power sector reform. It defines the new structure of the sector and the rules governing contracting and pricing of power. The main dispositions are as follows:</p> <ul style="list-style-type: none"> • defines the unbundling of the ELETROBRAS subsidiaries and outlines the division of ELETROBRAS itself into 20 new companies; • defines the basic rules for competition and foresees restrictions to avoid market power and to protect captive consumers, (namely Valor Normativo see Resolution 266/98); • establishes that energy exchanges will be freely negotiated among utilities, IPP's and free consumers, and creates wholesale power traders; • creates the wholesale electricity market (MAE) to facilitate exchanges of power net of long-term contracts; • substitutes Initial Contracts for the previous long-term contracts , at prices defined by ANEEL, but envisages that these would be gradually phased out between 2002 and 2006; • establishes that as Initial Contracts are extinguished, the utilities and consumes will enter into freely negotiated Bilateral Contracts, subject to regulatory oversight; • creates the national system operator (ONS) to be responsible for administering dispatch and controlling access to the transmission network; • establishes that Basic Network transmission should be provided by ONS at an average "postage stamp" price for the entire interconnected system, to be determined by ANEEL; • establishes that existing special rules for the trading of power from Itaipu should be maintained, and that ANEEL should define the corresponding rules for nuclear power; and • foresees the elimination of the Fuel Compensation Account (CCC) by 2006 for the interconnected system and by 2013 for isolated systems, as well as the elimination of the RGR by 2002. <p>Decree 2655/98 regulates those aspects of the law which relate to ONS and MAE. The main points are as follows:</p> <ul style="list-style-type: none"> • defines the governance arrangements for ONS and MAE; • requires separate accounting of distribution and commercialization services to free and captive consumers and of Basic Network and other transmission facilities services; • establishes that ONS will rent the utilities facilities that belong in the Basic Network; and • incorporates in the MAE the MRE (Energy Reallocation Mechanism) that provides protection with regard to hydrological uncertainties to hydro generators by pooling their surpluses with respect to their rated guaranteed capacity.

Table A3.4: Overview of planned new generating plants

	Type of Plant	MW	Date Commissioned	MAIN INVESTORS	TYPE OF INVESTOR	STATE	RIVER	ENV'TAL Status
Serra da Mesa	H	1275	1998	FURNAS, Camargo Correa (contractor)	G	GO	Tocantins	OL
Rio Negro IPP	D/G	158	1998	WARTSILA	IPP	AM		OL
Canoas I and II	H	154	1999	Companhia Bras. de Aluminio and CESP	LC	SP	Parapanema	OL
El Paso IPP	T	246	1999	El Paso/ ELETRONORTE	IPP	AM		OL
IGARAPAVA	H	210	1999	CVRD, CSN and CEMIG	LC	MG	Grande	OL
W. Arjona	G	75	1999	ENERSUL	D	MS		OL
Sobragi	H	60	1999	Comanhia Paraibuna de Metais	LC	MG	Paraiba do Sul	OL
Itá	H	1450	2000	CSN, Odebrecht (industry and contractor) and ELETROSUL/GERASUL	LC/G	SC/RS	Uruguai	OL
Uruguaiana	G	600	2000	AES	D	RS		OL
Cuiaba	D/G	480	2000	ENRON	IPP	MT		OL
Campo Grande	G	120	2000	ENERSUL	D	MS		OL
Lageado	H	850	2001	REDE Group, EDP	D	TO	Tocantins	IL
Macaé Merchant	G	720	2001	El Paso	IPP	RJ		IL
Electrobolt Merchant	G	350	2001	ENRON	IPP	RJ		OL
Dona Francisca	H	125	2001	GERDAU	LC	RS	Jacuí	OL
Porto Estrela	H	112	2001	CEMIG/CVRD/COTEMINAS	D/LC	MG	Santo Antonio	OL
Machadinho	H	1140	2002	Aluminum industries and GERASUL	LC/G	SC	Pelotas	OL
Araucária	G	470	2002	PETROBRAS, COPEL	GS	PR		IL
Juiz de Fora	G	144	2002	CFLCL	D	MG		IL
Piraju	H	70	2002	Companhia Brasileira de Alumínio	LC	SP	Parapanema	IL
Santa Clara	H	60	2002	Construtora Queiróz Galvão		BA	Mucuri	PL
FAFEN	G	56	2002	PETROBRAS,	GS	BA		OL
TERMORIO	G	920	2003	PETROBRAS,	GS	RJ		IL
Norte Fluminense	G	720	2003	EDF/Light	D	RJ		IL
Piratininga	G	600	2003	AES	IPP/D	SP		IL
COFEPAR	RR	500	2003	PETROBRAS,	D	PR		-
Ibirité	G	480	2003	PETROBRAS, CEMIG	GS	MG		IL
Termobahia	G	460	2003	PETROBRAS,	GS	BA		IL
Cana Brava	H	450	2003	GERASUL/TRACTEBEL	G	GO	Tocantins	IL
Quebra Queixo	H	120	2003	Companhia Energética Chapecó	D	SC	Chapecó	IL
Queimado	H	105	2003	CEMIG/CEB	D	MG/GO	Preto	-
Ourinhos	H	44	2003	Ourinhos Energia		PR	Parapanema	IL
Espora	H	32	2003	Fuad Rassi Eng., Ind. & Com.		GO	Corrente	-
Itapebí	H	450	2004	CEMIG	D	MG	Jequitinhonha	IL
Ponte de Pedra	H	176	2004	Ponte de Pedra Energética		MS/MT	Corrente	IL
Candonga	H	95	2004	CVRD	LC	MG	Doce	IL
Itumirim	H	50	2004	Companhia Energética Itumirim		GO	Corrente	PL canceled
Peixe Angical	H	452	2005	Consórcio ENERPEIXE		TO	Tocantins	-
Itaocara	H	195	2005	LIGHT		RJ/MG	Paraiba do Sul	-
Corumbá IV	H	127	2005	Corumbá Concessões		GO	Corumbá	PL
Murta	H	120	2005	Murta Energética		MG	Jequitinhonha	-
Picada	H	50	2005	Companhia Paraibuna de Metais	LC	MG	Peixe	PL
Barra do Braúna	H	39	2005	Cataguazes-Leopoldina	D	MG	Pomba	PL
Campós Novos	H	880	2006	Campos Novos Energia		SC	Canoas	IL
Irapé	H	360	2006	CEMIG	D	MG	Jequitinhonha	PL
Fundão/Santa Clara	H	238	2006	ELEJOR		PR	Jordão	-
Baú I	H	110	2006	Cataguazes-Leopoldina	D	MG	Doce	-
Corumbá III	H	94	2006	Energética Corumbá		GO	Corumbá	NA
Barra Grande	H	690	2007	VBC/ALCOA/VALESUL/CCCim.	LC	SC	Pelotas	-
Capim Branco	H	450	2007	CEMIG/CVRD/CMM/CCCim.	D/LC	MG	Araguari	-
CERAN	H	360	2007	CERAN		RS	Antas	NA
Serra do Facão	H	210	2007	ALCOA/CBA/DML/Votorant Cim.	LC	GO	São Marcos	NA
Fóz do Chapecó	H	855	2008	CVRD/Fóz do Chapecó Energia	LC	SC	Uruguai	NA

	Type of Plant	MW	Date Commissioned	MAIN INVESTORS	TYPE OF INVESTOR	STATE	RIVER	ENV'TAL Status
São João/Cachoeira*	H	105	tbd	Enterpa Engenharia		PR	Chopim	NA
Traira II*	H	60	tbd	CEMIG	D	MG	Grande	NA
Simplicio*	H	324	tbd	EDF	D	RJ	Parafba do Sul	NA
Salto Pilão*	H	181	tbd	CPFL/ALCOA/Votorantim	D/LC	SC	Itajaí	NA
São Salvador*	H	241	tbd	TRACTEBEL Sul	G	TO	Tocantins	NA
Monjolino*	H	67	tbd	ENGEVIX Engenharia		RS	Passo Fundo	NA
Pedra do Cavalo*	H	160	tbd	Votorantim Cimentos	LC	BA	Paraguaçu	NA
Pai Querê*	H	292	tbd	CPFL/ALCOA/CEEE/DME/Vot.	D/LC	SC	Pelotas	NA
Cubatão**	H	45		U. H. Cubatao		SC	Cubatão	-
São Jerônimo**	H	331		COPEL and other	D	PR	Tibagi	NA
Couto Magalhães*	H	150	tbd	CELTINS/Enerpaulo	D	GO/MT	Araguaia	NA
Santa Isabel*	H	1087	tbd	Billiton Metais/CVRD/CCCimentos	LC	PA/TO	Araguaia	NA

Notes:

Type of plant:

H-hydro;
G-gas;
T-thermal;
D-distribution;
RR-refinery res

Type of investor:

D-distributor;
LC-large industrial customer;
GS-gas supplier;
IPP-independent power producer.

Environmental status:

NA-recently granted concessions not yet listed by MMA
NL-listed by MMA but not yet licensed;
PL-preliminary license;
IL-implementation license;
OL-operating license

Locality:

AC Acre
AL Alagoas
AM Amazonas
AP Amapá
BA Bahia
CE Ceará
DF Distrito Federal
ES Espirito Santo
GO Goiás
MA Maranhao
MG Minas Gerais
MS MatoGrosso do Sul
MT Mato Grosso
PA Pará
PB Paraíba
PE Pernambuco
PI Piauí
PR Paraná
RG Rio Grande do Sul
RJ Rio de Janeiro
RN Rio Grande do Norte
RO Rondonia
RR Roraima
SC Santa Catarina
SE Sergipe
SP São Paulo
TO Tocantins

ANNEX 4: ENVIRONMENTAL AND SOCIAL ISSUES IN THE POWER SECTOR: CONTEXT, ISSUES AND PROPOSED PROGRAM

The Energy Sector Reform Project

The Energy Sector Reform Project is an adjustment operation which focuses on legal, regulatory and institutional reforms in the Brazilian power sector. The hydrocarbons sector is covered only as regards the provision of natural gas for electricity generation. The operation finances a part of Brazil's current account deficit. Its proceeds are integrated into the reserves of the Central Bank. No part of the loan is used for investments or other budget expenditures in the power sector.

There are also no indirect impacts on power sector budgets as a result of possible fungibility of resources across public sector budgets, for the following reasons:

- The proposed loan does not increase resources available for public sector spending. Under Brazil's fiscal regime, an adjustment loan from the Bank substitutes financing from alternative, more expensive debt sources and substitutes foreign for domestic lending. It does not increase aggregate fiscal resources available since the fiscal envelope is defined by the binding primary fiscal surplus targets determined under the Fiscal Responsibility Law and agreed with the IMF. These targets have been diligently complied with for the last three years. There is no indication whatsoever that they are being relaxed. The proceeds of the adjustment loan thus cannot even indirectly increase public spending (including investments). Also, the resulting savings on interest do not influence the primary balance and will thus reduce the public debt and cannot contribute to increased spending. This is an essential point in Brazil's fiscal management framework and is well documented in several Bank and IMF documents.
- There are no national budget transfers to the power sector. National government investments in the power sector are undertaken by Eletrobras, which is a listed joint-stock company with 30% private capital participation. These companies cannot legally receive budget transfers for their investments. Their investments are financed through internally generated resources and bond issues. There is no fungibility with fiscal resources (and certainly not with proceeds from the Bank's proposed adjustment lending).

The project has no direct or indirect adverse environmental or social impacts, since it focuses entirely on legal, regulatory and institutional reforms. It is accordingly rated as C for environmental/social safeguards purposes. Nonetheless, the Bank and the Government propose to take a proactive approach and have designed a strengthening program in line with the ongoing sectoral reforms. Environmental and social planning tools and institutional responsibilities will be revisited and updated as needed to fit the new, largely private sector-based model which has been adopted by the Government of Brazil, with the objectives of (i) ensuring appropriate

mainstreaming of environmental and social concerns in expansion planning and operation of power sector projects, and (ii) facilitating the timely licensing of future investment projects.

This annex summarizes the findings of an environmental issues paper, interviews and discussions conducted during preparation of the Energy Sector Reform Project with representatives of the power and environment sectors in Brazil. (A full version of the issues paper is available in Portuguese in project files.) The annex also describes the program that has been designed to strengthen the mainstreaming of environmental and social issues in the power sector and to improve the licensing process.

Regulatory Framework

Power sector projects (i.e., generation plants, transmission and distribution systems), depending on their nature, scale and location, can potentially occasion involuntary population displacement, loss of livelihoods, impacts on indigenous peoples, destruction of natural habitats, displacement of regional infrastructure (such as roads and bridges), and impacts on health, among others. Generation also contributes to climate change, positively or negatively, depending on the source of primary energy being used.

In accordance with Brazilian legislation, all power plants with capacity above 10 MW, whatever the source of primary energy used, and transmission lines above 230 kV must be licensed by environmental authorities. The licensing process (its scope, timing and procedures) is regulated by resolutions issued by the National Environment Council (CONAMA). Of special relevance are Resolutions 001/86 (general licensing framework), 006/87 (licensing of power sector projects), 009/87 (public hearings), and 237/97 (licensing of infrastructure projects). This regulatory framework is complemented by extensive legislation pertaining to water, fisheries, forests, wildlife protection, gaseous emissions, and water discharges, among others. Table A4.1 in Annex 4 provides a brief summary of the key pieces.

Three environmental licenses (Preliminary, Installation and Operation) are required at successive stages of the project cycle (respectively, before the conclusion of feasibility studies, before construction begins, and before filling of the reservoir, in the case of hydropower plants, or commercial operation, in the case of thermal plants). A detailed and comprehensive environmental impact assessment (EIA) should be presented to environmental authorities approximately six months before conclusion of the feasibility study. An environmental impact statement (RIMA), summarizing project objectives, impacts, and mitigation/compensation plans presented in the EIA, is also prepared and forms the basis for discussions with government agencies and the general public.

Review of power sector projects by environmental authorities and discussion with potentially affected people may take place as early as the inventory stage, i.e., before feasibility studies are undertaken. The legislation stresses the importance of public participation and recommends that the dialogue with stakeholders begin with a formal request for the Preliminary License, early in the feasibility stage. It also requires public disclosure of all EIAs. Public hearings, although not mandatory, have frequently been called for at the end of the feasibility stage to address public

concerns and other issues before the Preliminary License is issued. They may be called for either by the licensing agency, an NGO, the Public Prosecutor (*Ministério Público*) or by a group of at least 50 people.

Specific technical guidelines for managing environmental and social impacts in power sector projects have been developed, over the years, to instruct project preparation, licensing, implementation and operation, notably: Environmental Impact Studies Manual (1986), policy guidelines (for resettlement, indigenous peoples, flora and fauna, coal-fired thermal plants, among others) featured in the Power Sector Environmental Master Plan (1990), methodological guidelines for river basin inventory studies (1984; 1997 update), public consultation and negotiation (1993), and environmental/social cost accounting (1995). Such guidelines, largely developed by Eletrobras working in close collaboration with regional and state utilities and the power sector's research center (CEPEL), continue to be used as technical references, although not mandatory for plants being designed since the transition to the new sectoral model.

Institutional Framework

Licensing and enforcement by the environment "sector." Primary responsibility for environmental licensing and enforcement lies with the states. The Ministry of Environment, through the Brazilian Environment Institute (IBAMA), has responsibility for licensing binational projects, projects on national rivers or developed in two or more states, and projects which impact national protected areas. State agencies are in charge in all other cases. Box 1 describes the basic components of Brazil's National Environment System.

An assessment of the effectiveness of the licensing system in Brazil was recently conducted by UNDP and MMA. Overall, the results are positive, although there is considerable variation in the capacity of agencies across states. Strengthening their capacity is a long-term proposition. To this end, a number of initiatives are currently underway, including the National Environmental II Project – NEP II (Loan 45240-BR), financed by the Bank. One of NEP II's components is dedicated to institutional strengthening of state agencies and includes a sub-component focusing specifically on environmental licensing, enforcement and post-license monitoring capabilities. Activities financed under this sub-component include: (i) assessment of the current status and future needs of state licensing systems; (ii) priority setting; (iii) development of streamlined procedures; (iv) production of technical manuals; (v) staff training; and (vi) the development of improved post-license monitoring and enforcement techniques, among others. It is also foreseen that this sub-component could provide support for the development of innovative instruments such as compliance agreements, self regulation, voluntary compliance and tradable permits. At the federal level, the strengthening of environmental licensing, enforcement and post-license monitoring capabilities are supported by the National Environment Program financed by the IDB.

Box 1 The Brazilian Environmental System

The Ministry of the Environment and Renewable Resources (MMA) is the central agency in charge of the national policies for the environment (PNMA), water resources (PNRH) and the Legal Amazon. The Minister presides over councils in each area: CONAMA, CNRH and CONAMAZ. All other regulatory and fiscal agencies that make up the National Environmental System (SISNAMA) are located within the structure of the MMA, states and municipalities.

The MMA's specific secretariats include: Environmental Quality of Urban Settlements (SQA), Water Resources (SRH), and Coordination of the Amazon Region (SCA). Also linked to the MMA are the Brazilian Environmental Institute (IBAMA), which is the executing agency of the PNMA as well as the licensing agent for projects which have regional and national impact; and the Federal Water Regulatory Agency (ANA), which is responsible for implementing the PNRH, for granting water rights in bodies of water belonging to the federal government, and for oversight/coordination of the National System of Water Resources Management. The latter includes the River Basin Committees and their respective Water Agencies which are responsible for rational use of water resources in each basin highlighted by the federal and/or state governments as the subject of individualized management.

Members of CONAMA, the country's foremost normative body in matters pertaining to the environment, include representatives from various segments: each ministry, each secretariat of the Office of the President of Brazil, each state, the National Association of Municipalities and Environment, associations of employers and workers, the Brazilian Steel Industry Institute, the Brazilian Association of Sanitary and Environmental Engineering (ABES), and the Brazilian Foundation for Nature Conservation (FBCN) among other NGOs.

Environmental management in the power sector. The institutional framework described above for the environment sector is supplemented by planning functions carried out within the power sector itself. In the configuration that was in place prior to the reform of the power sector, state-owned and operated utilities with extensive generation programs (roughly eight of the nearly thirty companies that were in place through 1995) had developed, over the years, in-house capacity to design, implement and operate environmental and social programs to address minimization, mitigation, and/or compensation of the impacts of power projects. Functions carried out by utilities with regard to specific projects and expansion of their power systems were complemented by others carried out by the Ministry of Mines and Energy (definition of sectoral policy), Eletrobras (coordination of power sector expansion planning and operation; generation of technical and methodological specifications for project design and operation), and CEPEL (research and modeling).

Under the new model of the Brazilian power sector, projects are concessioned to operators (public or private), whose responsibility it becomes to design the project and carry out the necessary impact assessments, develop mitigation/compensation plans, secure the appropriate licenses from the environmental authorities, and implement the approved action plans. Annex 3 presents a summary of the power sector's institutional framework. Box 2 highlights the responsibilities on the part of the relevant entities in charge or policy making, regulatory and planning functions as regards environmental and social issues in the sector today.

Box 2 Environmental functions of power sector entities

National Energy Policy Council (CNPE): Advises the President on matters relating to energy policy and formulates guidelines for the rational use of energy resources. Among its eight Technical Committees, one is the Environment Committee.

Power System Expansion Coordinating Committee (CCPE): Responsible for sectoral planning, including the 10-year expansion plans for generation and transmission systems. Generation plans are only indicative, thus there is no certainty that projects will in fact materialize. Of CCPE's various sub-committees, one (CTSA) focuses on Environmental and Social Studies.

Ministry of Mines and Energy (MME): Responsible for guidelines for the development of national energy policy and strategic coordination of energy sector development plans, including as regard appropriate handling of environmental and social impacts of sector activities. Promotes research and development in the energy sector, including collection of hydrological data, and development of renewable resources. The Energy Secretariat is subdivided in two Departments (Energy Policy and Energy Development) and has an Environment Unit that supports both departments. The Secretariat supervises ANEEL and supports both CNPE and CCPE.

Federal Electricity Regulatory Agency (ANEEL): Issues regulations, awards concessions to sector operators, supervises concession contracts, revises tariffs, and monitors service quality. Prepares some river basin inventories. Monitors the physical implementation of environmental and social programs associated to power sector projects, although from a technical and normative perspective, responsibility for ensuring compliance with mitigation/compensation plans rests with the licensing agency.

National System Operator (ONS): Conducts the dispatch of all generating plants larger than 50 MW connected to the national grid, and coordinates the operation of the interconnected system (transmission lines greater than 230 kV). Environmental licenses typically establish the conditions under which generation plants will operate. These requirements must be respected by ONS.

Energy Crisis Management Chamber (GCE): Is temporarily in charge of some of the functions of MME, as a special body created to manage the national response to the energy crisis. The MMA is part of the GCE.

The current pipeline of power sector projects was largely developed before the reform process began. The licensing process is being carried out much as before privatization, following established procedures. However, Eletrobras no longer carries out technical reviews of projects before submission to the sector regulatory agency (formerly DNAEE, now ANEEL) and to environmental licensing agencies at each pertinent stage of the project cycle. Its former role entailed prior screening, quality assurance, and clearance of compliance with licensing requirements, especially at the feasibility stage. Thus, under the current model, demands on the technical expertise of environmental licensing agencies have increased significantly, in a context in which the quality of EIAs are still sub-optimal.

The Power Sector in Transition: Issues for the Short and Medium-term

Since the beginning of the privatization process in 1995, the power sector has undergone extensive revision of its regulatory and institutional frameworks. This process is still ongoing and, as part of the transition, some revision of regulations and significant realignment of institutional responsibilities with regard to the management of environmental and social issues in the power sector will be needed. Because, as indicated above, a substantial pipeline of projects in advanced stage of design was already available when the transition began, the need for such changes in the regulatory and institutional frameworks did not immediately present itself. However it has surfaced in the context of the current crisis and will be a potential bottleneck to future system expansion if not addressed soon. The proposed sequence of adjustment operations and the ESTAL are meant to support the completion of power sector reform as regards, among other areas, the management of environmental and social issues.

Key issues faced by the power sector can be grouped under four areas (which are also discussed in the main text):

(a) During the current energy crisis, the licensing framework has come under frequent attack as being untimely and unpredictable.

While there is a reasonably solid framework in place for handling environmental and social issues in the power sector, licensing of power sector projects is guided by norms that were adopted before the reform of the power sector and the establishment of the National Water Policy. They thus need to be revisited and selectively revised to fit the current context. In addition, some technical inconsistencies in the legislation also predate these changes and should be addressed (e.g., with respect to the minimum area required for the protection of reservoirs or for transmission line rights-of-way). Of special relevance is the fact that the uncertainties and transaction costs associated with environmental licensing are perceived by many to be a serious limitation to timely expansion of the system in a private sector-based model. Suggestions for changes have emerged, ranging from a possible centralization at the federal level of the licensing system, to the institution of special task forces to support state agencies in addressing critical cases. "Quick fixes" run the risk of throwing away considerable advances made over the past twenty years and of introducing ad-hoc measures into a basically consistent framework. There is however room for improvement, making the licensing system more effective and responsive to the dynamics of the private sector, for instance by institutionalizing the use of strategic EIAs, as has occurred in the case of the oil and gas sector in the State of Rio de Janeiro. Another promising development was the creation in September 2000 of the Environment Committee in CNPE and in June 2001 of the Energy Committee in CONAMA to facilitate coordination across sectors. In March 2002, the Ministers of Environment and of Mines and Energy signed a Memorandum of Understanding establishing the scope and terms of a technical cooperation program covering nine broad areas relating to the mainstreaming of environmental and social concerns in energy sector activities, and placing special emphasis on the strengthening of environmental licensing agencies, as well as on improved monitoring and ex-post evaluation of the impacts of energy sector activities on the part of the energy sector. These coordination

mechanisms and agreements need to be fleshed out and consolidated to support effective and timely planning and licensing of power sector projects.

A preliminary assessment of the current regulatory framework that applies to environmental licensing was conducted recently by MMA, which, joined with the findings of the Special Commission for Analysis of the Hydro-Thermal Power System, the work of the GCE, and other agencies, should form the basis for an in-depth evaluation of the adequacy and possible improvements in the current environmental licensing system as regards power sector projects. This evaluation, the revision of Resolution 006/97 and other specific recommendations resulting from the evaluation will be supported through the proposed ESTAL.

(b) There is considerable lack of clarity with respect to institutional responsibilities and imbalance in the availability of technical capacity across agencies in the sector.

This is especially the case with respect to activities pertaining to the early stages of the project cycle, e.g., river basin inventories, studies of alternative locations of thermal plants, and sectoral expansion plans and strategies, for longer-term horizons. However it also applies to subsequent stages, in which activities which were formerly the responsibility of utilities and Eletrobras have been transferred to operators, ANEEL and the MME. While this shift was meant to sort out roles and avoid conflicts of interest within institutions, the new agents do not necessarily have the technical capacity to respond to their mandates. For instance, the Environment Coordination Unit of MME's Energy Secretariat currently counts only two high-level staff. In this regard, it is important to note that the technical capacity in environmental and social issues developed by the sector in the past two decades or more represents a tremendous investment in human capital. It is still largely available since the system is in transition and could be realigned under the new model so as to minimize the uncertainties and delays currently associated to the licensing process. It would also be expected that Eletrobras and the National Social and Economic Development Bank (BNDES), as potential investors and financing agents of power system expansion, would have a prominent role in assessing environmental and social risks and mitigation projects and programs in which they are likely to be involved.

An independent assessment of the performance of regulatory agencies will be carried out under the ESTAL. It should include the clarification of the institutional role of MME, CCPE, ANEEL, ANA, and other government entities, with respect to the handling of environmental/social issues. Recommendations with respect to the strengthening of the regulatory and other power sector agencies would also be supported in the proposed ESTAL.

(c) In the longer term, dealing with the environmental and social externalities generated by power sector projects, requires coordination on the part of energy, water resource management and environmental agencies.

The available pipeline of projects will need to be revisited soon for a number of reasons, notably: (i) the Brazilian system is strongly hydro-based and ad-hoc concessioning of individual projects in disregard of a comprehensive study of the complete cascade has drawbacks in terms of optimizing generating capacity; and (ii) optimal multiple use of water resources has gained importance since the approval of the National Water Resources Policy in 1997 and the creation of the CNRH and ANA; inventories of river basins will need to be systematically updated to

incorporate these as well as generally heightened concerns on the part of local communities and Brazilian society with respect to environmental and social impacts. Several agencies (ANEEL, ANA, MME and Eletrobras) are currently advancing methodological and other studies to respond to what they perceive as their mandate. It is quite urgent that responsibility for extensive river basin inventory work be clearly assigned, that methodologies be updated so as to fully incorporate environmental, social and multiple costs and benefits, and that a mechanism for institutional cooperation be put in place. Updating the inventories for the country's major river basins would significantly minimize risks associated to power sector development. Given the potential relevance of thermal plants in future expansion of the generation system, strategic macro-siting (regional) studies are also a priority as an instrument to assess options and risks.

The Memorandum of Understanding between MMA and MME, referred to previously, also places special emphasis on better mainstreaming environmental and social concerns during the early stages of the planning process, and on better integration of multiple objectives in resource development. Furthermore, a model of the longer-term planning responsibilities within the sector has been proposed by MME. Broad-based discussion and agreement amongst the key institutional stakeholders is needed but is likely to extend beyond the timeframe of the current operation. Thus, this process, as well as specific recommendations to strengthen planning functions, would be supported in the proposed ESTAL. The ESTAL would also support an update/revision of river basin inventories, including the environmental/social impacts of alternative cascade arrangements, as well as strategic EIA for the siting of thermal power plants.

(d) A vision of the environmental and social implications of longer-term expansion of the power sector needs to be developed to reduce uncertainties and make best use of resources and opportunities.

The power sector is currently operating in a "crisis mode," prioritizing immediate avoidance of a major collapse in the supply of electricity. Beyond this phase however, both private sector participation and consideration of the public interest in a capital intensive, long lead time sector such as power require some strategic planning.

A clear identification of the likely expansion paths (e.g., fuel uses, comparative advantages across regions), key issues and implications of alternative paths (e.g., likely impacts, opportunities to participate in emerging markets for carbon emission reductions), and options for addressing them (e.g., mitigation strategies, synergies with other initiatives, institutional, regulatory and methodological requirements, financial implications, funding opportunities), is needed. The ESTAL will support formulation of a methodology to conduct strategic EIA in the power sector, based on a methodological proposal commissioned by MMA for strategic EIA generally and on international best practice. It will also support the carrying out of a pilot exercise to assess impacts and opportunities associated to alternative longer-term expansion paths for the power sector.

The Proposed Program

Within the new sectoral framework, management of environmental and social issues will need to reconcile public (i.e., societal) and sectoral interests (as previously was the case), but also private

interests. This entails balancing four objectives -- sustainable use of natural resources, social equity in dealing with impacts, transparency in the decision making processes, and responsiveness to the dynamics of the private sector (e.g., clear and simple “rules of the game,” low and/or predictable transaction costs).

In line with the nature of the proposed operation, which focuses on legal, regulatory and institutional reforms in the power sector, the issues identified in the previous section will be dealt with in the ESTAL through a strategic, sectoral approach, covering:

- (a) review and adjustment, as needed, of environmental requirements, procedures and mandates for licensing of power sector projects;
- (b) assessment of the performance of power sector regulatory agencies to clarify their institutional roles and coordination requirements vis-à-vis other government entities, such as the Ministry of Environment, the National Water Agency, and the Ministry of Mines and Energy;
- (c) revision and realignment of key institutions with regard to mandates and procedures for mainstreaming of environmental and social issues in longer-term expansion planning, including coordination with water resources management and environmental agencies;
- (d) carrying out a set of studies on priority topics including: project preparation methodologies; strategic assessment of longer-term system expansion paths; river basin inventories; strategic assessment of the thermal power program; issues and options relating to potential participation of the sector in markets for carbon emissions reductions and other environmental services; and promotion of corporate responsibility;
- (e) strengthening (number and qualification) of professional cadres within the power and environment sectors, with special emphasis on the environmental licensing capacity in regions/states where expansion of the sector is likely to be concentrated over the coming years; and
- (f) strengthening of monitoring and ex-post evaluation of environmental and social issues in the power sector.

While the first three activities are of relevance in the very short-term, the last two sets of activities address issues related to expansion of the sector in the longer term. Overall, these activities will comprise a ‘Program to Strengthen Planning and Management of Environmental and Social Issues in the Power Sector’, to be implemented in successive stages, over the medium-term. For the first four-year period, the program will be supported by the ESTAL, to be appraised and negotiated in parallel with the current operation.

Terms of Reference of the Program have been agreed between the Ministry of Mines and Energy, the Ministry of Environment and the Bank. (See end of Annex 4) These terms of reference were prepared in coordination with a working group of senior power sector professionals. **Detailed TORs** will be prepared and discussed with a broader set of key institutional stakeholders (including representatives of the environmental “sector”, the private sector, and academia) before the start of project implementation of the ESTAL. As currently envisaged in the TORs, development of the **Program** itself will be undertaken in stages, with consultations/validation carried out at each major stage (e.g., diagnostic, preliminary design and

overview of program priorities, formulation of a multi-year strategy, formulation of the first phase action plan) and, as needed, in each one of the sub-projects. An advisory board, technical groups and a consultation strategy have been outlined on a preliminary basis and will be detailed and agreed in the final TORs of the Program during project implementation. This multi-year program would extend over the medium-term, possibly supported by the Bank through subsequent operations.

Table A4.1: Summary of Key Legal Framework with respect to Environmental and Social Issues in the Brazilian Power Sector

Legislation	Brief Summary of Contents
Constitution	Enacted in 1988, it deals with the environment, in several of its provisions, covering about 20 different articles, one of which, no. 225, deals exclusively with this subject. For this reason, it has been called by some jurists the “Green Constitution.” It defines the environment, biodiversity and ecological systems and services as public goods, assigning their guardianship to public authorities in the country’s different political and administrative units, to the Public Prosecutor (<i>Ministério Público</i>), to communities and citizens. It prescribes instruments and means to this end: environmental impact assessments (EIAs) which will be publicized; concurrent federal, state and municipal legislation; and public participation in processes relating to creation of environmental regulations, in the formulation and implementation of environmental policies and in actions carried out through the Judiciary.
Law 6938/81	Institutes the National Environmental Policy (PNMA), creates the National Environmental System (SISNAMA), establishes as key instruments of the PNMA environmental impact assessments (EIAs) and the licensing of projects and activities that are likely to have environmental impacts, and requires public disclosure at different stages of the project cycle. SISNAMA is comprised of: a Government Council (not created); the National Environment Council (CONAMA), a consultative and deliberative body, responsible for establishing national environmental guidelines and regulations; MMA, as central agency; IBAMA, as executing agency; state environmental agencies and entities; and municipal agencies or entities. This law was regulated by Decree 99.274/90, which confirmed the practices recommended by CONAMA with regard to environmental licensing throughout the 1980s, as well as the diverse, collegiate composition of CONAMA.
Law 7347/85	Regulates citizens' suits regarding responsibility for environmental damages and provides other measures. It emphasizes injunctions under the initiative of the Public Prosecutor (<i>Ministério Público</i>), the federal government, states and municipalities and environmental associations. It calls for the Public Prosecutor be a law enforcement agent with respect to the environment.
Law 7990/89	Institutes financial compensations for states and municipalities for the development of water resources for purposes of power generation within their territories, as well as for mining.
Law 9433/97	Institutes the National Water Policy (PNRH), the National Water Resources Council (CNRH) and the National System of Water Resources Management. It creates Water Resources Plans for watersheds (PRHB), in observance of criteria for multiple use of water resources and priorities established through shared decision-making processes, highlighting River Basin Committees comprised of representatives of the country’s various political and administrative units involved in the basin under analysis, of water users and other stakeholders. It creates various instruments for the PNRH, in addition to PRHBs, highlighting the granting of and charges for the use of water and compensation to

	municipalities.
Law 9605/98	Establishes, among other things, penalties for citizens, companies and their responsible agents who cause damage to the environment, as well as for public employees who commit crimes against environmental administration.
Law 9985/00	Establishes the National System of Protected Areas (SNUC), considering various categories of sustainable management and integrated protection of natural resources. It provides the government with instruments for the effective implementation of the System, calls for the involvement of populations residing within and outside the protected areas (conservation units), and establishes fines and penalties on offenders. It recognizes officially established private reserves, and institutes incentives for collaboration of the private sector with country's biodiversity conservation goals.
CONAMA Resolutions	CONAMA established relevant environmental concepts, practices and requirements, through numerous resolutions issued since 1986. Those having major sectoral repercussions (and their relevance to the power sector) are as follows: 001/86, requiring EIAs for power plants larger than 10 MW; 006/87, establishing guidelines for environmental licensing of power sector projects; 009/87, regulating public hearings; 005/89, establishing the National Air Pollution Control Program; 003/90, defining air quality standards; 008/90, defining emissions standards for various gases in power plants larger than 70 MW; 002/96, requiring ecological compensation/mitigation, in the amount of at least 0.5% of the plant's total investments; 237/97, updating 001/86 and 006/87 and seeking to define jurisdictions under the scope of licensing agencies.

Box 3 Program to Strengthen Planning and Management of Environmental and Social Issues in the Power Sector

Preliminary view of potential topics of study

A. Sectoral policy and planning

- 1) Adjustment and improvement of methodologies for:
 - (a) inclusion of environmental and social dimensions in the expansion plan;
 - (b) systemization of Strategic Environmental Assessment in the sector;
 - (c) preparation of river basin inventory studies;
 - (d) preparation of feasibility studies for hydropower plants, thermal plants and transmission systems.
- 2) Study of the environmental and social implications of alternative scenarios for expansion of supply in the medium and long-term (approx. 15 years), taking energy conservation into account.
 - (a) Development of methodologies for studies on macro-siting of thermal power plants;
 - (b) Strategic assessment of the Thermal Power Priority Program;
 - (c) Establishment of guidelines for integrated management of water resources in the Amazon region; and
 - (d) Establishment of guidelines for R&D in the power sector, dealing with environmental and social aspects.

B. Legal, regulatory and institutional framework related to environmental licensing

- 1) Preparation of a compendium of legal and regulatory provisions related to management of environmental and social issues in the power sector;
- 2) Adjustment of licensing process:
 - (a) Evaluation of the environmental licensing process for the power sector, including institutional roles, regulatory requirements and necessary managerial and operational adjustments;
 - (b) Revision of CONAMA Resolution 006/87; and
 - (c) Preparation of guidelines for environmental licensing of power sector projects;

C. Studies and research on priority technical issues

- 1) Incorporation of climate change considerations in power sector planning and evaluation of potential participation in carbon emissions reduction markets;
- 2) Biodiversity;
- 3) Resettlement of population groups;
- 4) Benefits associated with plans and projects;
- 5) Environmental performance indicators associated with sectoral projects;
- 6) Development of methodologies to analyze the management of environmental risks in sectoral plans and projects;
- 7) Guidelines for preparation of economic and ecological zoning plans for reserves and their buffer zones; and
- 8) Preparation of regulation for establishment of levels of electromagnetic fields.

D. Management instruments

- 1) Adjustment and complementing of guidelines and procedures for the promotion of institutional coordination in the new model, with regard to:
 - (a) formulation of policies;
 - (b) planning of sectoral expansion;
 - (c) systems operation;
 - (d) management of plants and transmission systems;
- 2) Adjustment and improvement of guidelines and instruments for environmental and social cost accounting and consideration in tariffs;
- 3) Structuring of a geo-referenced information system to optimize planning and management activities;
- 4) Adjustment and improvement of guidelines for social participation and negotiations;
- 5) Establishment of instruments to disseminate and promote the use of ISO 14.000 Norms; and
- 6) Promotion of corporate accountability on environmental and social issues among power sector companies.

E. Institutional strengthening

- 1) Definition of a training program for sectoral staff and staff of other institutions related to environmental and social management of power sector projects and activities; and
- 2) Definition of a training program for research institutions dealing with the sector's environmental and social issues;
- 3) Promotion of a program to structure and strengthen the areas of public and private sectoral enterprises dealing with environmental and social issues;
- 4) Implementation of agreements aimed at the strengthening of environmental agencies.

TERMS OF REFERENCE

Program to Strengthen Planning and Management of Environmental and Social Issues in the Power Sector

Context

Within the new sectoral framework, management of environmental and social issues will need to reconcile not only public (i.e., societal) and sectoral interests (as previously was the case), but also private interests. This entails balancing four key objectives -- sustainable use of natural resources, social equity in dealing with impacts, transparency in the decision-making process, and responsiveness to the dynamics of the private sector (e.g., clear and simple "rules of the game," low and/or predictable transaction costs).

To achieve these objectives, the Ministry of Mines and Energy (MME) and the Ministry of Environment and Natural Resources (MMA) recently signed an "Environmental Agenda," setting forth nine broad areas of collaboration for the coming years. In line with the Agenda, the Government proposes to implement a "Program to Strengthen Planning and Management of Environmental and Social Issues in the Power Sector." The program would be implemented in successive stages, the first of which would be within a four-year timeframe, with support from the ESTAL from the World Bank.

A. Objectives

To promote adequate planning and operation of the Brazilian power system with regard to environmental and social issues, under a management model in which participation of the private sector is expected to increase over the coming years. Thus, more specifically:

- 1) To identify the main short-, medium- and long-term bottlenecks for the proper functioning of the sector and alternatives for resolving them.
- 2) To propose a medium-term strengthening program, to be carried out in stages, identifying priority actions of a legal, regulatory, institutional, methodological and analytical (studies and research) nature, with the respective responsibilities, timetables and budgets.
- 3) To design and carry out a select number of priority studies.
- 4) To promote consensus among the principal institutional stakeholders in the power, environmental and other sectors, taking into account national, regional, local, public and private interests.

B. Activities and Methodology

The process of preparing the medium-term Program and its first stage, the Priority Action Plan (PAP) would unfold in the following manner:

1) Identification or establishment of coordination and consultation mechanisms, including:

- (a) an Executive Committee, coordinated by the Secretariat of Energy and comprised of representatives of institutions with relevant participation in the planning and management of environmental and social issues in the power sector; the Committee would be responsible for (i) supervising the preparation of the Program, (ii) seeking its approval by relevant authorities, (iii) seeking the allocation of resources needed to implement the Program, and (iv) monitoring its implementation;
- (b) Technical Working Groups (for example, those of the CCPE), set up as needed by the Executive Committee; the groups would conduct the identification and discussion of priority problems, guide the work of consultants in preparing reports, recommendations and terms of reference for subsequent works, and follow up on execution as needed; and
- (c) Mechanism(s) for public consultation with collegiate bodies (for example, CONAMA, CNRH, CNPE and other permanent or *ad hoc* forums), associations of representatives of different sectoral agents (for example, ABRAGE, ABRATE, ABCE and others) and environmental entities (for example, MMA, IBAMA, OEMAs, ABEMA and others); such mechanism(s) would allow discussion of priority issues and proposals to solve them, as well as to build consensus around proposed courses of action.

2) Execution of a rapid diagnostic of the sector's main problems with regard to planning and management of environmental and social issues:

Priority will be given to issues that correct distortions already identified before the start-up of sector reform, as well as to new challenges arising from the process of transition from a predominantly state-managed model to a model based on private participation, among others:

- (a) defining the mandates of management agencies (within and outside the power sector) and seeking operational reconciliation among such mandates;
- (b) balancing resources among management agencies;
- (c) promoting institutional consolidation; and
- (d) systemizing sectoral planning, with special emphasis on the strategic assessment of alternative expansion paths and on promoting an integrated view of the use of water resources.

These issues transcend the scope of environmental and social concerns, implying that this rapid sectoral diagnostic should be closely coordinated with other initiatives taking place in the power sector that are also focused on or can contribute to addressing the above four points.

3) Discussion and validation of the rapid diagnostic:

The following, at least, should be included in the consultation/validation process:

- (a) entities responsible for proper use of natural resources and for the fair treatment of those potentially affected by power sector projects or decisions;
- (b) entities responsible for decision-making and for allocating the (technical and financial) resources needed to resolve problems relative to environmental and social issues in the power sector; and
- (c) entities with knowledge and information that are relevant to such problem-solving.

4) Workshop on strategic environmental assessment methodologies:

In order to promote access to international “best practice” and provide expert input to subsequent activities, a workshop will be held with the participation of sectoral and environmental entities and international specialists, focusing on strategic environmental assessment (SEA). Besides reviewing the current thinking on approaches to SEA and relevant case studies illustrative of such approaches, the workshop will discuss:

- (a) the sectoral diagnostic;
- (b) a preliminary view of issues that could be potentially addressed in the medium-term Program, as set forth in Box 3; and
- (c) study topics that, given their importance and relative urgency in the current context of the sector, would configure a Priority Action Plan (PAP) to be carried out over 2-3 years.

5) The topics that, in principle, are proposed as part of the PAP would be the following:

- (a) revision and adjustment, as needed, of the legal, regulatory and institutional frameworks;
- (b) formulation and/or revision of power system expansion planning methodologies, river basin inventories, and macro-location of thermal power plants;
- (c) strategic environmental assessment of sectoral expansion alternatives;
- (d) river basin inventory studies;
- (e) strategic assessment of the thermal power program;
- (f) potential participation of the sector in markets for carbon emissions reductions and other environmental services;
- (g) training of human resources in the power and environmental sectors and strategic strengthening of the environmental licensing capacity in regions/states where expansion of the sector is likely to be concentrated over the coming years;
- (h) strengthening of capacity for monitoring and ex-post evaluation of environmental and social issues in the power sector; and
- (i) promotion of corporate accountability.

6) Preparation of a medium-term Strengthening Program and of the Priority Action Plan (PAP) (preliminary versions):

Based on the diagnostic and recommendations stemming from the consultation process and the workshop, this activity would specify medium- and long-term objectives and goals, as well as instruments to promote the strengthening of planning and management of environmental and social issues in the power sector, identifying:

- (a) priority actions of a legal, regulatory, institutional, methodological and analytical nature (studies and research), as needed;
- (b) implementation strategy for the Program, whose execution is planned in stages, over the medium-term , with a tentative definition of respective institutional responsibilities, timetables, budgets and monitoring arrangements; and
- (c) terms of reference, methodology and indicators of expected results for the projects/activities that would comprise the Priority Action Plan (PAP) to be implemented in the first 2-3 years.

7) Discussion and validation of conclusions and recommendations:

An approach similar to that in item 3 (Discussion and validation of diagnostic) should be used. Results achieved up to this stage (with emphasis on conclusions and recommendations) should also be presented to relevant ministerial authorities (within MME, MMA, Planning and Finance).

8) Detailed formulation of the Strengthening Program and Priority Action Plan:

The preliminary versions of the Program and the PAP should be adjusted to recommendations stemming from their discussion, and final versions of the following documents should be prepared:

- (a) Medium-term Strengthening Program, including objectives, premises and general implementation strategy (in accordance with item 5.b above); and
- (b) Priority Action Plan for the first 2-3 years, with detailed terms of reference for all the proposed projects and activities which are part of it, including institutional arrangements, coordination mechanisms, budgets, sources of financing, timetables, results indicators, and monitoring and evaluation mechanisms needed for proper execution of projects and activities.

9) Approval of Medium-Term Strengthening Program and Priority Action Plan by relevant ministerial authorities (within MME and MMA).

10) Execution of Program and of Action Plan: The Program will be implemented in stages, by means of Action Plans agreed for each, according to the general process

defined above. Monitoring and evaluation of the implementation process and of the results of one stage should provide information for the preparation of the next stage.

C. Timetable

The preparation of the Program and the Action Plan is expected to take 6-8 months, and the priority studies which are part of the latter are expected to take 24-36 months, depending on the scope of some items (for instance, river basin inventories).

D. Modality of Execution

Activities would be carried out with the assistance of consultants, under the guidance of the Executive Committee and with the support of the Technical Working Groups mentioned in item C.1.a and b of these terms of reference. Contracting of services would follow World Bank procurement guidelines and the implementation arrangements specified in the Legal Agreement for the ESTAL.

ANNEX 5: OPERATIONS PORTFOLIO (IBRD/IDA AND GRANTS) as of May 14, 2002

CAS Annex B8 - Brazil
Operations Portfolio (IBRD/IDA and Grants)
As Of Date 05/14/2002

Closed Projects 217

IBRD/IDA *	
Total Disbursed (Active)	2,749.47
of which has been repaid	416.28
Total Disbursed (Closed)	21,999.55
of which has been repaid	19,089.62
Total Disbursed (Active + Closed)	24,749.02
of which has been repaid	19,505.90
Total Undisbursed (Active)	2,946.26
Total Undisbursed (Closed)	11.19
Total Undisbursed (Active + Closed)	2,857.46

Project ID	Project Name	Last PSR Supervision Rating		Fiscal Year	Original Amount in US\$ Millions				Difference Between Expected and Actual Disbursements **		
		Development Objectives	Implementation Progress		IBRD	IDA	GRANT	Cancel.	Undisb.	Orig.	Frm Rev'd
P006559	(BF-R)SP.TSP	S	S	1998	45				25.0	25.0	
P043873	AG TECH DEV.	S	S	1997	60				33.6	32.7	21.0
P006562	BAHIA MUN.DV	S	S	1997	100				51.7	51.7	3.5
P035728	BAHIA WTR RESOURCES	S	S	1998	51				28.9	26.5	8.4
P006564	BELO H.M.TSP	S	S	1995	99				18.1	18.1	
P037828	BR (PR)R.POVERTY	S	S	1996	175				84.5	83.3	67.3
P058129	BR EMER. FIRE PREVENTION (ERL)	S	S	1999	15				8.9	8.9	8.9
P047309	BR ENERGY EFFICIENCY (GEF)	S	S	2000			15		11.9	3.0	
P073294	BR Fiscal & Fin. Mgmt. TAL	S	S	2001	8.88				7.9	1.7	
P006474	BR LAND MGT 3 (SAO PAULO)	HS	S	1998	55				51.8	35.1	22.0
P057910	BR PENSION REFORM LIL	HS	S	1998	5				3.1	3.1	-0.4
P043869	BR SANTA CATARINA NATURAL RESOURC & POV.	#	#	2002	62.8				62.8		
P006541	BR WTR Q/PLN(SP/PR/FED)	S	S	1993	245			5.2	4.2	9.3	3.1
P054120	BR- AIDS & STD Control II	S	S	1999	165			3.5	40.9	39.4	
P043874	BR- DISEASE SURVEILLANCE - VIGISUS	S	S	1999	100				61.9	61.9	
P050763	BR- Fundescola 2	S	S	1999	202.03				42.5	-27.5	
P006554	BR- HEALTH SECTOR REFORM - REFORCUS	S	S	1996	300				104.1	104.1	
P006543	BR- MINAS GERAIS BASIC EDU.	S	S	1994	150				3.7	3.7	
P038947	BR- SC. & TECH 3	S	S	1998	155				121.3	121.3	
P058565	BR- BA BASIC EDU PROJECT (PHASE I)	S	S	2001	69.8				37.0	-10.5	
P059566	BR- CEARA BASIC EDUCATION	S	S	2001	90				86.2	-1.8	
P057665	BR-FAMILY HEALTH EXTENSION PROJECT	#	#	2002	88				68.0		
P048357	BRAZIL CEN.BANK TAL	S	S	1998	20				0.0	0.0	-7.3
P046052	CEARA WATER PILOT (SIM)	S	S	1997	9.6				2.2	2.2	1.7
P006449	CEARA WTR MGT (PROGERIRH) (SIM)	S	S	2000	138				123.4	45.1	
P006438	Ceara Urban Development & Water Resource	S	S	1995	140				18.6	18.6	11.1
P039200	ENERGY EFFICIENCY (ELETROBRAS)	S	S	2000	43.4				42.7	12.9	
P006522	ESP.SANTO WATER	S	S	1994	154			54.0	11.9	65.9	6.2
P006532	FED HWY DECENTR	S	U	1997	300				156.7	156.7	56.3
P038895	FED.WTR MGT	S	S	1998	198				124.8	113.9	59.4
P060221	FORTALEZA METROPOLITAN TRANSPORT PROJECT	S	S	2002	85				87.9	0.0	
P006210	GEF BR-NATL BIODIVERSITY	S	S	1996			10		3.2	4.4	5.1
P055954	GOIAS STATE HIGHWAY MANAGEMENT	S	S	2002	65				64.4	5.3	
P062619	INSS REF LIL	S	S	2000	5.05				1.1	0.5	-0.7
P008475	LAND RFM PILOT (SIM)	S	S	1997	90				23.8	23.8	
P050772	LAND-BASED POVERTY ALLEVIATION I (SIM)	S	S	2001	202.1				180.9	30.7	
P051701	MARANHAO R.POVERTY	S	S	1998	80				10.4	0.2	
P008505	MATO GROSSO NAT RES	U	S	1992	205			15.0	12.1	27.1	
P035741	NATL ENV 2	S	HS	2000	15				13.1	8.8	6.7
P050776	NE Microfinance Development	HS	S	2000	50				40.4	-9.6	
P042565	PARAIBA R.POVERTY	S	S	1998	60				28.9	18.4	
P039199	PROSANEAR 2	S	S	2000	30.3				28.6	-0.7	
P038896	R.POVERTY(RGN)	HS	S	1997	24				0.6	0.6	
P040028	RAILWAYS RESTRUCTURG	S	S	1998	350			75.0	17.6	92.6	17.6
P038882	RECIFE M.TSP	S	S	1995	102				14.8	14.8	
P034578	RGS HWY MGT	S	U	1997	70				53.6	50.9	38.9
P043868	RGS LAND MGT/POVERTY	S	S	1997	100				57.1	40.7	16.2
P043421	RJ M.TRANSIT PRJ.	S	S	1998	188			17.2	138.1	155.3	
P008454	RODONIA NTRL RES. M	U	S	1992	187			10.0	10.8	20.8	
P050881	RURAL POVERTY REDUCTION PROJECT - PI	S	S	2001	22.5				21.1	7.4	
P057649	Rural Poverty Reduction Project - BA	S	S	2001	54.35				51.3	7.4	
P050875	Rural Poverty Reduction Project - CE	S	S	2001	37.5				32.5	3.4	
P050880	Rural Poverty Reduction Project - PE	S	S	2001	30.1				28.9	1.5	
P048869	SALVADOR URBAN TRANS	S	S	1999	150				107.7	74.3	
P074085	Sergipe Rural Poverty Reduction	#	#	2002	20.8				20.8		
P051696	SÃO PAULO METRO LINE 4 PROJECT	S	S	2002	209				209.0	0.0	
P073192	TA Financial Sector	S	S	2002	14.46				14.5	0.0	
P043420	WATER S.MOD.2	U	U	1998	150				147.0	140.2	121.9
Overall result				Result	5797.47		25	179.8	2861.4	1723.0	466.8

a. Intended disbursements to date minus actual disbursements to date as projected at appraisal.

ANNEX 6: STATEMENT OF IFC'S HELD & DISBURSED PORTFOLIO as of January 31, 2002

FY Approval	Company	CAS Annex B8 (FC) for Brazil									
		Brazil									
		Statement of IFC's Held and Disbursed Portfolio As of 1/31/2002 (in US Dollars Millions)									
		Held		Disbursed		Held		Disbursed			
		Loan	Equity	Quasi	Partic	Loan	Equity	Quasi	Partic	Partic	
	1987 Guilman-Antonim	23.78	0	0	0	25.78	0	0	0	0	
	1988 Ictu Equity	0	20	0	0	0	12.14	0	0	0	
1980/87/87	1989 Innova SA	29.33	0	0	0	29.33	0	0	0	60	
	1989 Ipiranga	0	5.34	0	0	0	5.34	0	0	57.27	
	1989 JOSAPAR	8	0	7	0	0	0	0	0	0	
1987/82/98/99	1985 LATASA - Brazil	1.33	0	0	0	1.33	0	0	0	7	
	1985 Loja Americana	14	0	5	0	2	14	0	0	5	
	1985 MBR	20	0	0	0	0	0	0	0	2	
	0 Mercado Nordeste	6.33	0	0	0	0	6.33	0	0	0	
1975/86	1996 Mallory	4.36	0	0	0	4.36	0	0	0	0	
	1994 Para Pigmentos	21.5	0	9	12.32	21.5	0	0	0	12.32	
1987/86	1989 Poiteno Ind.	15.31	0	0	0	15.31	0	0	0	0	
1989/85	1989 Portobello	5.85	0	0	0	5.85	0	0	0	0	
1994/00/02	2000 Purus	4.97	0	0	0	0	1.15	0	0	0	
	1988 Randon	6.53	0	3	0	6.53	0	0	0	0	
	1991 Rhodia-Sier	0	5.85	0	0	0	5.85	0	0	0	
	1995 Rhodiaco/PTA	7.5	0	0	0	7.5	0	0	0	3	
	1990 Ripasa	0	5	0	0	0	0	0	0	0	
	1997 Rodovia	27.22	0	0	47.7	27.22	0	0	0	47.7	
	11 S.A.I.C.C.	0	2.85	0	0	0	2.85	0	0	0	
1987/87	1987 SP Alpergatas	16.87	0	5	0	16.87	0	0	5	0	
1984/95/97	1987 Sedia	20.5	0	8.83	109.33	20.5	0	8.83	109.33	0	
	2000 Samaritano	11.7	0	0	6.87	11.7	0	0	0	6.87	
	1988 Sariva	10.38	3	0	0	10.38	3	0	0	0	
	0 Saara Alimentos	0	3.88	0	0	0	3.88	0	0	0	
	2001 Sapitiba	32	0	0	8	17	0	0	0	8	
	1987 Sucofco	7.5	0	0	0	7.5	0	0	0	0	
	2001 Surtako	18	0	0	0	18	0	0	0	0	
	1988 TIGRE	13.46	0	5	6.41	13.46	0	0	5	6.41	
	TRIKEM	0	0	0	0	0	0	0	0	0	
1982/83	1988 Tecon Rio Grande	6.65	0	5.5	14.84	6.65	0	5.5	14.84	0	
	2001 Tecon Salvador	3.5	1	0	6	3.5	0	0	0	6	
	1983 Votorantim	1.43	0	0	0	1.43	0	0	0	0	
	1989 Vuicabras	16.88	0	0	0	16.88	0	0	0	0	
	1987 Wiembly	0	10	0	0	0	10	0	0	0	
	1989 Wiset	0	0	8	0	0	0	0	8	0	
1986/87	2001 AG Concession	0	15	15	0	0	0	0	0	0	
	Algar Telecom	8	0	0	0	8	0	0	0	0	
	2001 Apolo	8	0	0	0	0	3	0	0	0	
	1988 Artes	20	7	0	18.33	20	7	0	18.33	0	
	1988 AutoBAN	35	0	0	31	29.22	0	0	25.88	0	
	1983 BACELL	4.9	15.7	0	5.4	4.9	15.7	0	5.4	0	
	2000 BBA	40	0	0	0	20	0	0	0	0	
	1988 BSC	9.88	0	0	5.29	9.88	0	0	5.29	0	
1983/86	BUNGE/CEVAL	0	8.06	0	0	0	8.06	0	0	0	
1990/81/82	Bahia Sul	0	0	0	0	0	0	0	0	0	
	1986 Banco Bradesco	10.48	0	0	11.18	10.48	0	0	11.18	0	
	1987 Borporco	18.87	0	5	0	18.87	0	5	0	0	
	1981 Bradesco-Eucatex	2.5	0	0	0	2.5	0	0	0	0	
	1985 Bradesco-Heifing	7.5	0	0	0	7.5	0	0	0	0	
	1981 Bradesco-Parizol	7.5	0	0	0	7.5	0	0	0	0	
	1981 Bradesco-Rentel	0	0.4	0	0	0	0.4	0	0	0	
	1985 Bradesco-URA	7.5	0	5	0	7.5	0	5	0	0	
	CHAPCO	15	6.41	0	0	15	6.41	0	0	0	
1984/88	1985 CODEMIN	0	0.4	0	0	0	0.4	0	0	0	
1973/78/83	1985 CRP-Chideri	7.5	0	0	0	0	0	0	0	0	
	1985 Cambury/MC	25	0	0	102.86	25	0	0	102.86	0	
	1987 Copeaul	0	0	0	0	0	0	0	0	0	
	Colentina	0	0.53	0	0	0	0.53	0	0	0	
1983/87/00	DENPASA	0	0.12	0	0	0	0.12	0	0	0	
1980/82	Ditel Holding	0	4.18	0	0	0	4.18	0	0	0	
1985/86/88/02	1988 Dble Toge	0	15	0	0	0	15	0	0	0	
1987/86/87	Duratax	16.57	0	0	40.71	16.57	0	0	40.71	0	
	1989 Eliane	32	0	13	0	32	0	13	0	0	
	1988 Empesca	5	0	10	0	5	0	10	0	0	
	Excol@	0	0.28	0	0	0	0.28	0	0	0	
2001/02	2000 Fleury	9	0	6	0	0	6	0	0	0	
	1988 Fosterfil	20	0	0	37.5	20	0	0	37.5	0	
	1988 Fra-Hé	10	0	10	0	10	0	10	0	0	
	1984 GAVEA	6.25	0	5.5	0	6.25	0	5.5	0	0	
	1984 GP Capital	0	9.67	0	0	0	9.67	0	0	0	
	2001 GPC	9	0	0	0	0	9	0	0	0	
	Total Portfolio:	731.43	158.78	133.83	649.28	657.65	131.34	115.53	644.16	0	
Approvals Pending Commitment											
		Loan	Equity	Quasi	Partic	Loan	Equity	Quasi	Partic	Partic	
	2002 Banco Itau	0	0	0	0	100000	0	0	0	0	
	2000 BBA	10000	0	0	0	50000	0	0	0	0	
	2001 Bred Templeton	0	20000	0	0	0	0	0	0	0	
	2001 Cataguazas	45000	0	7500	0	40000	0	0	0	0	
	1989 Cbrasec	0	7500	0	0	0	0	0	0	0	
	2001 Satipel	15000	0	15000	0	0	0	15000	0	0	
	2002 Unibanco-CL	0	0	0	0	0	0	0	0	150000	
	2001 Unisul	15000	0	0	0	0	0	0	0	0	
	2002 Univali	10000	0	0	0	0	0	0	0	0	
	Total Pending Commitment:	95000	27500	15000	340000	0	0	0	0	0	

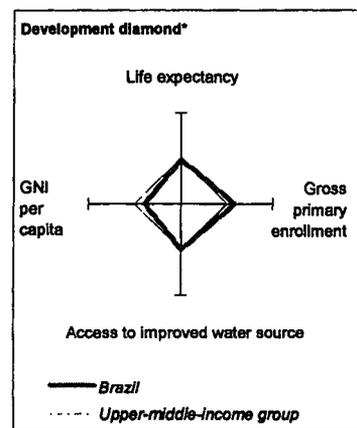
ANNEX 7: COUNTRY AT A GLANCE

Brazil at a glance

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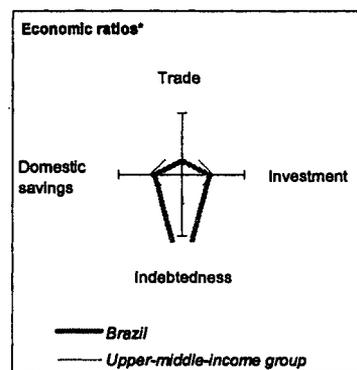
POVERTY and SOCIAL

	Brazil	Latin America & Carib.	Upper-middle-income
2000			
Population, mid-year (millions)	170.1	518	647
GNI per capita (Atlas method, US\$)	3,590	3,680	4,620
GNI (Atlas method, US\$ billions)	610.1	1,895	2,986
Average annual growth, 1994-00			
Population (%)	1.3	1.6	1.3
Labor force (%)	1.9	2.3	2.0
Most recent estimate (latest year available, 1994-00)			
Poverty (% of population below national poverty line)	22	..	..
Urban population (% of total population)	81	75	78
Life expectancy at birth (years)	67	70	69
Infant mortality (per 1,000 live births)	32	30	28
Child malnutrition (% of children under 5)	8	9	..
Access to an improved water source (% of population)	87	85	87
Illiteracy (% of population age 15+)	15	12	10
Gross primary enrollment (% of school-age population)	125	113	107
Male	..	..	106
Female	..	..	105



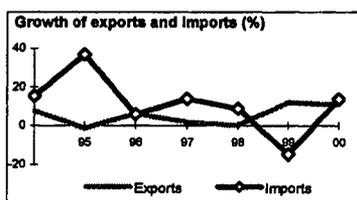
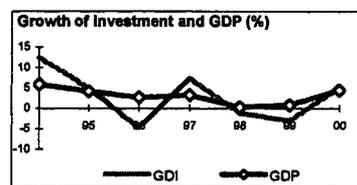
KEY ECONOMIC RATIOS and LONG-TERM TRENDS

	1980	1990	1999	2000	
GDP (US\$ billions)	235.0	465.0	529.4	595.5	
Gross domestic investment/GDP	23.3	20.2	20.4	20.5	
Exports of goods and services/GDP	9.1	8.2	10.6	10.9	
Gross domestic savings/GDP	21.1	21.4	19.3	19.3	
Gross national savings/GDP	17.8	18.9	16.1	..	
Current account balance/GDP	-5.5	-0.8	-4.8	-4.1	
Interest payments/GDP	2.7	0.4	2.5	2.5	
Total debt/GDP	30.4	25.8	45.6	39.7	
Total debt service/exports	63.4	22.5	112.3	77.9	
Present value of debt/GDP	..	..	45.9	..
Present value of debt/exports	..	..	403.7	..
1980-90 1990-00 1999 2000 2000-04					
<i>(average annual growth)</i>					
GDP	2.7	2.9	0.8	4.5	3.6
GDP per capita	0.8	1.5	-0.5	3.2	2.3
Exports of goods and services	7.5	5.5	12.0	11.0	13.0



STRUCTURE of the ECONOMY

	1980	1990	1999	2000
(% of GDP)				
Agriculture	11.0	8.1	7.2	7.4
Industry	43.8	38.7	27.5	28.8
Manufacturing	33.5	..	23.1	24.0
Services	45.2	53.2	65.3	64.0
Private consumption	69.7	59.3	61.8	62.5
General government consumption	9.2	19.3	18.9	18.2
Imports of goods and services	11.3	7.0	11.7	12.1
1980-90 1990-00 1999 2000				
<i>(average annual growth)</i>				
Agriculture	2.8	3.2	7.4	3.0
Industry	2.0	2.6	-1.6	5.0
Manufacturing	1.6	2.1	-0.7	..
Services	3.3	3.0	1.3	3.9
Private consumption	1.2	5.7	6.1	9.9
General government consumption	7.3	-1.7	-9.3	-5.4
Gross domestic investment	3.3	3.4	-3.0	5.0
Imports of goods and services	0.5	11.9	-14.8	13.8

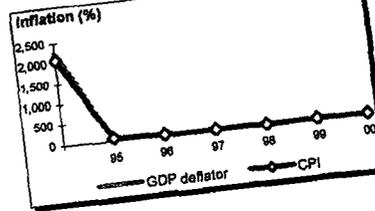


Note: 2000 data are preliminary estimates.

* The diamonds show four key indicators in the country (in bold) compared with its income-group average. If data are missing, the diamond will be incomplete.

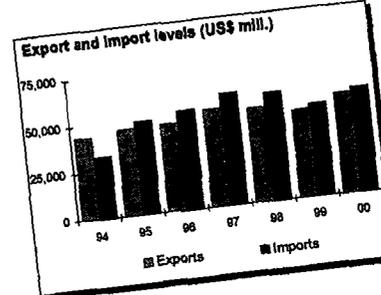
PRICES and GOVERNMENT FINANCE

	1980	1990	1999	2000
<i>Domestic prices</i>				
(% change)	..	2,947.7	8.9	6.0
Consumer prices	87.3	2,509.5	4.3	8.5
Implicit GDP deflator				
<i>Government finance</i>				
(% of GDP, includes current grants)	..	..	19.5	20.0
Current revenue	..	..	0.4	1.0
Current budget balance	..	..	-8.8	-3.2
Overall surplus/deficit				



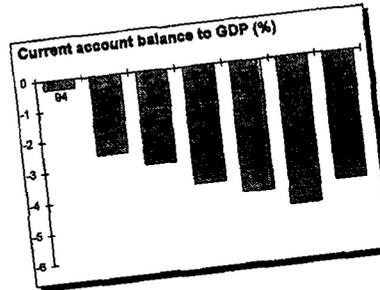
TRADE

	1980	1990	1999	2000
(US\$ millions)				
Total exports (fob)	..	31,414	47,140	53,589
Coffee	..	2,856	2,746	3,048
Soybeans	..	2,854	1,593	2,188
Manufactures	..	19,624	35,312	41,027
Total imports (cif)	..	20,661	49,275	55,800
Food	..	1,379	1,855	1,507
Fuel and energy	..	4,354	4,258	6,362
Capital goods	..	5,932	13,570	13,583
Export price index (1995=100)	80	81	91	97
Import price index (1995=100)	65	74	113	118
Terms of trade (1995=100)	123	109	80	82



BALANCE of PAYMENTS

	1980	1990	1999	2000
(US\$ millions)				
Exports of goods and services	21,857	34,815	55,205	64,470
Imports of goods and services	27,788	28,708	83,443	72,741
Resource balance	-5,931	7,907	-8,238	-8,271
Net income	-7,044	-12,523	-18,848	-17,886
Net current transfers	42	834	1,889	1,521
Current account balance	-12,933	-3,782	-25,397	-24,636
Financing items (net)	8,980	-5,043	13,834	33,815
Changes in net reserves	3,943	8,825	11,763	-9,179
<i>Memo:</i>				
Reserves including gold (US\$ millions)	5,853	9,175	35,725	33,011
Conversion rate (DEC, local/US\$)	1.92E-11	2.48E-5	1.8	1.8



EXTERNAL DEBT and RESOURCE FLOWS

	1980	1990	1999	2000
(US\$ millions)				
Total debt outstanding and disbursed	71,520	119,877	241,468	238,200
IBRD	2,035	8,427	6,822	7,377
IDA	0	0	0	0
Total debt service	14,757	8,168	67,522	53,200
IBRD	275	1,975	1,381	1,351
IDA	0	0	0	0
Composition of net resource flows				
Official grants	14	41	62	..
Official creditors	825	-833	860	-2,037
Private creditors	3,745	-427	-11,828	-32,675
Foreign direct investment	1,911	989	32,659	..
Portfolio equity	0	0	1,961	..
World Bank program	820	905	1,863	1,593
Commitments	343	788	1,533	1,892
Disbursements	98	1,251	952	887
Principal repayments	245	-483	580	805
Net flows	177	725	428	464
Interest payments	68	-1,187	152	341
Net transfers				

