

NICARAGUA

ENERGY SECTOR POLICY NOTE

EXECUTIVE SUMMARY

Rationale

1. **Energy policy figures prominently on the Government of Nicaragua's agenda.** The increase in oil prices has brought about increasing economic pressure, particularly when considering the country's trade, where oil imports increased by 22 percent between 2005 and 2006, and constitute 21 percent of total imports—the largest single item on the trade balance. Although transport accounts for most consumption of oil and oil products, it is the power sector which has generated more controversy, either because electricity prices have not increased in response to higher production costs, or because investment has dried up.

2. **In 2006 the power sector went through a major crisis.** By mid-2006 there were widespread blackouts and the distribution company was being held responsible. The new Government, inaugurated in January 2007, inherited a dysfunctional sector, with aggressive confrontation between the private sector and the regulator, which could lead to severe financial losses. Confrontation escalated in 2006 with the Government requesting arbitration to determine whether the distribution concessionaire complied with its contractual obligations, and the latter calling a guarantee with the World Bank's Multilateral Investment Guarantee Agency (MIGA) due to alleged regulatory expropriation.

3. **This policy note seeks to provide a balanced point of view for the Government.** The situation in early 2006 was clearly unsustainable, and the inauguration of a new Government is an opportunity to take a fresh look at the situation with a view to reaching agreement in the short term and stability for the future. The objective of this note is to provide a level-headed approach to the problem, taking into account the long-term perspectives of the sector together with lessons learned elsewhere when facing similar problems.

Power sector background

4. **Problems have been building up for some time.** The crisis should be viewed as a culmination of a relatively extended process stemming from a power sector reform in the late 1990s which did not live up to expectations. Reforms in Nicaragua were initiated around 1992 when investments in private power plants were allowed, and culminated in 1999 with the privatization of the distribution subsector and the sale of several power plants to private investors.

5. Investment in new generation—which was expected to develop as a result of market incentives—never took off. In fact, very little additional capacity was added to the system in the post-reform period. In addition, the sector's regulation and governance reflected a confrontation between the Executive and Legislative branches, which characterized most of the previous administration (2002–07) and which led to situations

such as the simultaneous appointment of two regulators. In the absence of political will to apply the regulatory rules, tariffs lagged and the distribution company's financial performance suffered accordingly.

6. The private sector has not been successful in addressing some of the sector's major problems. Electricity losses in particular have scarcely improved since privatization; at around 28 percent, losses drastically reduce the amount of cash available for covering both distribution and upstream (transmission and generation) costs. Under these circumstances debts pile up and the sector requires external cash injections. The latter have taken place either through additional equity contributions from the distribution company's parent company, or through fiscal contributions to cover past tariff lags.

Issues and objectives

7. The issues faced by the sector concern the financial situation, the legal framework, the overall pattern of energy use in Nicaragua, the questions of access to electricity, and the fiscal impact of the energy subsector. Accordingly, six objectives were identified:

- Achieving financial sustainability;
- Establishing a stable legal framework and predictable regulation;
- Securing supplies;
- Improving the energy matrix;
- Improving access and expanding rural electrification; and
- Avoiding the risk of high fiscal costs and supporting private sector involvement.

In many ways these questions are interrelated: some of the financial shortcomings are related to deficiencies in the legal and regulatory framework, which provides negative signals for investment and leads to an excessive reliance on high cost fuels; improved coverage is required for faster economic development and will demand more supply; finally, any Government intervention in the energy sector should avoid jeopardizing public finances or exposing them to costly risks by seeking continued private sector involvement.

8. **Financial sustainability requires a drastic reduction of losses.** Energy losses amount to around 28 percent of total energy injected into the distribution system; they should be no more than 14 percent under moderately efficient conditions. The cost of foregone sales could amount to as much as US\$61 million, which represents around 19 percent of the system's gross income; however, because the financial losses are concentrated in the distribution company, if they were reduced to acceptable levels, the distribution company could increase its net income by between 100 and 150 percent.

9. Attacking the problem of excessive losses has suffered from inaction, fatalism, and a lack of official support. On one hand the distribution company has been manifestly weak in pursuing the losses that constitute "low-hanging fruit," that is, those associated with larger users who tamper with the meters or their connections, and, on the other, it

has more or less given up on reclaiming the losses from slums or similar subnormal areas where the local population does not allow them to operate. Solving the problem requires that the company and the authorities cooperate. On the question of larger users, the regulator and the authorities should endorse the distribution company and help it to disconnect delinquent consumers. On the question of slums, the company should seek to improve its image and interact with local leaders to provide service, public lighting, and better connections in exchange for billing and collection. Such methods have been used elsewhere and the company would do well to look into them and follow their example.

10. **A stable legal framework and predictable regulation are a matter of political will.** The electricity regulator in Nicaragua has many good characteristics, including nominal independence. However, independence has been confused with the ability to ignore its mandate and to implement regulations more or less depending on circumstantial conditions. One of the consequences has been that tariff adjustments are not put in place due to the risk of unpopular reaction. Another has been a willingness to meddle with the basic market rules, such as the price-setting procedures in the market. This has come about because the regulator has become answerable to political interests, and correcting course will require an explicit determination on the part of Government—both at the Executive and Legislative branches—to support the regulator’s decisions, whether they are perceived as unpopular or not.

11. **Predictable regulation requires a stable tariff policy.** It is also a requirement to assure financial sustainability. One of the cornerstones of the reform process consisted of implementing phased tariff changes, which would have ensured cost-reflecting tariff schedules and focused subsidies. These measures were never implemented by the regulator, due to the unpopular consequences they could have among affected consumers. Further studies were financed by the World Bank around 2005, which provide detailed insight on what to do, including the reform of inefficient cross-subsidization, which is embedded in the existing schedules. Ideally, predictability and price policy stability would be ensured by the automatic application of a well-designed tariff formula, which would enable the different segments of the market to be remunerated adequately and opportunely.

12. **Securing sufficient generation capacity is the highest priority in the power subsector.** Reforms required to address the issues in the sector will resonate among decisionmakers only if the more alarming signals of breakdown are addressed. An emergency solution is being put in place with power plants financed by the Venezuelan government; these are high-cost units that are adequate to address the shortage of generation, but are not a response to the underlying problems of the sector which require economic supplies based on a longer-term viewpoint. As proven by the lack of new investment in recent years, investors are unwilling to commit funds unless they are reasonably assured of an effective return on them. Several circumstances conspire against this: (a) with the existing loss levels potential generators can easily deduce that not enough resources are being captured through billing to properly remunerate everybody—and their dependence on the distribution company makes it likely that they may not be paid; (b) the remuneration rules on the spot market have been manipulated by the regulator, thereby distorting incentives; and (c) legislation is unfriendly toward the

development of renewables such as hydroelectricity and geothermal, either because of undefined water rights or excessively protected areas. In the short run measure

13. **Improving the energy matrix is closely associated with securing supplies.** Most power sector investments in the last decade have been in oil-based thermal plants. This has skewed the composition of generation, which has become more oil-dependent and therefore more sensitive to its price increases. In this sense Nicaragua depends on oil far more than other Central American countries (75 percent oil based against 43 percent). This is of particular concern in a country that is rich in renewable resources, particularly hydroelectric and geothermal ones. The hydroelectric project catalog includes several large plants which may require the regional market for their justification, but also a number of medium-sized ones which are likely candidates for development, possibly under public-private partnership schemes. Similarly, a geothermal survey identified at least 10 areas of interest which could also balance the structure of power supply and reduce the dependence on oil. Other alternatives regarding new fuels, such as natural gas or coal, require visualizing them within the regional context, because the small size of the Nicaraguan system would not allow their introduction under economical conditions.

14. **Improved access should be a foremost concern.** Nicaragua has the lowest electrification rate among the Central American countries, particularly in the rural areas, where it is below 40 percent. Under such circumstances, any subsidies to electricity consumers, which comprise the minority and better off population, are necessarily regressive. Improving service coverage will require overcoming institutional obstacles, such as the lack of definition regarding the transfer of electrification assets to the distribution company, and new approaches based on private sector cooperation. In particular, approaches such as those pioneered by the Bank-supported Rural Electrification PERZA project, provide replicable examples of how to extend coverage with private sector investment complemented by government subsidies, particularly in the more remote and poorest areas of the country. In addition, electrification efforts in urban areas (where coverage is around 92 percent) should not be neglected; although only 8 percent of potential users remain to be connected, they are also potential illegal users who may connect to the grid forcefully if action is not taken on their behalf.

15. **The fiscal costs of intervention in the sector should be carefully assessed and continued private sector involvement should be encouraged.** Despite its shortcomings, the power sector is not a major burden on the government's finances: one of the benefits of reform has been that financial losses have been privatized and are effectively contained within the distribution subsector. Currently, the only fiscal costs associated with the power sector consist of losses from supplying small and isolated loads, transmission company losses, and the cost of waiving the value-added tax for consumers below 150kWh/month, a total cost of around US\$9 million per year. This is far below the cost of assuming control of the distribution company, at least until energy losses can be controlled—the foregone income associated with energy losses could be as high as US\$60 million per year. Policy should seek to preserve the existing setup by avoiding actions which increase public sector exposure, and maintaining a vigorous private sector presence. Private sector investment could be forthcoming if sufficient guarantees are in place, either explicit ones (which require a strengthened private

distribution company) or implicit ones such as those associated with a financially viable power sector. In any case, further Government involvement in the sector should be carefully evaluated against the risk of creating liabilities on public monies and alienating private sector presence.

16. In addition to the operational losses, nationalization of distribution could also be very expensive. If the Multilateral Investment Guarantee Agency (MIGA) policy claim is accepted, the Government would have to reimburse MIGA around US\$59 million, and if expropriation with compensation is the adopted route, compensation is likely to be in excess of US\$80 million.

Recommendations

17. **Defusing confrontation.** Perhaps the most important recommendation consists of defusing the confrontation with the distribution company and seeking common ground for improving service conditions. This should be based on well-documented knowledge regarding the sector's problems, including (a) a quantification of losses and alternatives to address them; (b) an operational audit of the distribution company to determine whether it is lagging in its required investment program and remedial actions; and (c) a quantification of debt among sector actors, with agreed amounts and, eventually, disputed items.

18. **Seeking political endorsement for finding common ground.** Accepting an objective assessment of what has gone wrong and what requires fixing is a condition for getting ahead on any compromise solution. This applies to all sector actors; in particular, the Ministry of Energy and Mines (MEM) and the *Instituto Nicaragüense de Energía* (INE) should act with sufficient political backing to avoid confrontations within the National Assembly. The outcome of negotiations should be not only agreement with those directly concerned, that is, the distribution company, but also a well-defined power sector policy to reactivate private sector interest.

19. **Price reform will be required.** The existing subsidization scheme is unfair and should be corrected, and tariff schedules should be reformed to simplify the existing structure and provide efficiency incentives.

20. **Extending electricity service should continue to be a priority.** FODIEN, the rural electrification agency of the Government, has been successful in improving coverage in recent years, but a greater effort may be required in order to mobilize private sector support, along the lines pioneered by the PERZA electrification project. With the creation of the Ministry of Mines and Energy, FODIEN has had to submit to new bureaucratic rules, which have increased its dependence on Ministry of Finance allocations of funds. It is possible to waive these rules, or at least to streamline them, and the Government should do so.

21. **Sector expansion is a major consideration.** This will require a substantial effort in updating existing studies for hydroelectric and geothermal projects, and possibly undertaking additional ones. These studies should feed into a long-term expansion plan, which should indicate priorities for developing new projects within a regional context.

22. **These recommendations point out a path for further Bank support:**

- Financing the updating of feasibility and prefeasibility projects of hydro and geothermal plants;
- Financing the development of a medium- and long-term power expansion plan;
- Advisory support in addressing remedial measures for energy loss reduction;
- Assistance in updating tariff studies and implementing tariff reforms;
- Assistance in addressing legal shortcomings that impede adequate development of power projects and electrification;
- Assistance in determining whether FODIEN has performed up to expectations since it was reformed, whether it can accomplish its functions under the existing constraints, and whether new rules are required; and
- Assistance for improved electrification schemes with private participation.

POWER SUBSECTOR

Introduction. This policy note is part of a larger endeavor to assist the Government of Nicaragua in dealing with a crisis in the energy sector in general, due to an escalation of the fuel bill associated with higher oil prices, and in the power subsector in particular. The latter is experiencing the failure of sector reforms undertaken in the late 1990s, and confrontation among authorities and between authorities and the private sector. The Government was inaugurated in January 2007 and has expressed its intention to take rapid action and rehabilitate the sector. The World Bank is supporting this intention with this initial analysis and further analytical resources in the future, to be focused on those areas where the Government requires most help. The note concentrates on the power subsector, where problems are most acute. The oil subsector, which is in private hands and has generated little controversy, is analyzed in the Annex.

Road map. The power sector analysis includes (a) a background section which summarizes some of the major developments in the sector since 1990; (b) a snapshot of the power subsector with some of the basic data to support the analysis; (c) a section on issues, identifying the main goals required for rehabilitating the system and highlighting potential fiscal risks; and (d) specific recommendations.

1. BACKGROUND

1.1 **Until the early 1990s the power subsector centered around a single public power company.** Until 1992 the power sector in Nicaragua had been a state monopoly centered on the *Instituto Nicaragüense de Energía* (INE), which concentrated all operational activities, and, implicitly, all regulatory functions. Around 1994, in common with many countries in Latin America, a reform process began; initially, in 1995, operational functions were assigned to a new company, *Empresa Nicaragüense de Electricidad* (ENEL), and regulatory functions were assigned to INE.

1.2 **The sector was reformed together with that of other Central American countries toward the end of the 1990s.** In 1998 an Electricity Law was passed which put in place: (a) a wholesale market with multiple generating companies, remunerated in accordance with a spot price determined by the highest marginal cost of production at any given hour; (b) a contracts market involving generating companies, distribution companies, and large consumers, which provides hedging against fluctuations in the spot market; and (c) a regulated market of end users, served by distribution companies at prices set by a regulator.

1.3 The corporate structure was changed to implement the reforms: (a) ENEL's transmission functions were assigned to a single-purpose company, ENTRESA (now ENATREL), which is also in charge of system dispatch; (b) ENEL's generation assets were segregated for privatization, and (c) ENEL's distribution assets and functions were assigned to two new companies (Disnorte and Dissur) to be privatized.

1.4 **A substantial private sector presence materialized.** The privatization process yielded: (a) one privatized thermal power company, (b) a management contract for a

geothermal power plant, and (c) the sale of the two distribution companies to a single private investor/operator (*Unión Fenosa*). ENEL continues to operate the system's hydro assets and thermal power plants, which did not generate interest from the private sector.

1.5 The presence of the State in the sector was strengthened through the creation of the *Comisión Nacional de Energía* (CNE), in charge of planning, sector policy, promoting rural electrification and legal initiatives associated with the power sector. INE was left with regulatory and supervisory functions, together with licensing of generation and transmission companies, and distribution concessions.

1.6 **Results of the reform have been disappointing.** Sector performance was far below expectations created by the reform; the weakness of the sector's institutions was evidenced early on by their difficulty in implementing measures required by the Electricity Law. This led to confrontation between the authorities and the private operators, which escalated due to the unwillingness of the regulator to transfer to consumers the rise in oil prices experienced until mid-2006.

1.7 **Disorder was exacerbated by interagency confrontation.** Lack of agreement between the regulator and the Government was exacerbated by a profound political crisis during the previous Government. The National Assembly, controlled by the opposition, rejected Government proposals to correct sector shortfalls, and legislated to micromanage it—at one point there were two regulators, one appointed by the Assembly and one appointed by the Government (the regulator appointed by the Assembly prevailed). Until the change of Government, INE officials refused to cooperate with CNE officials, and vice versa. The problems were compounded by the inability of the privatized distribution company to control losses, and by a serious lack of institutional discipline, which is a requirement for a reformed and privatized power sector to function effectively.

1.8 In January 2007 a new law created the Ministry of Energy and Mines (MEM), a successor to CNE with additional functions which were transferred from INE, such as licensing, and oil and hydrocarbons policy, as well as the approval of regulations and norms in the energy and mines sector. This has resulted in a more balanced decisionmaking process from a bureaucratic point of view, and INE has been brought into line with the Government. The Government is no longer locked into confrontation with the Assembly and there is an opportunity for concerted action to address the sector's shortcomings.

2. THE CURRENT SITUATION

The following is a snapshot of the system as of late 2006/early 2007, including supply and demand, access and electrification, the wholesale market, and electricity pricing and subsidies.

Supply and Demand

2.1 **Supply has not increased as expected.** Nicaragua is the Central American country with the lowest installed capacity and the lowest electricity production. Although installed capacity (that is, the power that well-maintained plants should supply) in the National Interconnected System (NIS) increased from 638MW in 2001 to 751MW

in 2006, effective capacity (that is, power that is actually available) only increased from 536MW to 589MW, as shown in Table 1.

Nominal Installed Capacity (MW)						
Power Stations	2001	2002	2003	2004	2005	2006
Thermal (fuel and diesel oil)	432.50	432.50	432.50	438.50	438.50	432.50
Thermal (Bagasse cogeneration)	27.80	40.80	65.30	121.80	126.80	126.80
Hydropower	107.81	104.40	104.40	104.40	104.40	104.40
Geothermal	70.00	77.50	77.50	77.50	87.50	87.50
TOTAL NIS¹	638.11	655.20	679.70	742.20	757.20	751.20
Effective Installed Capacity (MW)						
	2001	2002	2003	2004	2005	2006
Thermal (fuel and diesel oil)	401.90	409.90	405.55	383.55	383.55	367.63
Thermal (Bagasse cogeneration)	14.00	32.35	61.00	96.10	108.30	81.03
Hydropower	94.00	98.00	98.00	98.00	98.00	98.17
Geothermal	26.00	34.00	31.20	30.00	37.10	41.74
TOTAL NIS	535.90	574.25	595.75	607.65	626.95	588.57

¹National Interconnected System. *Source:* INE

The difference between nominal and effective capacity is quite striking; it is due mainly to the operation of older thermal power plants, which should either be overhauled or replaced; in the case of geothermal units, capacity is limited because the wells used to extract steam from the geothermal reservoir have been exhausted, and no new wells have been drilled to replace them.

2.2 Dependence on oil has increased since the reform. The difference between nominal installed capacity and effective installed capacity reflects the age of the equipment, particularly in the case of oil-based thermal units, which cannot deliver their rated output. Table 1 also shows the dependence of generation on oil-based plants, which account for over 60 percent of capacity, for serving peak loads. Hydro generation has not increased, and the geothermal plant provides less than 50 percent of its rated capacity, as noted above due to the absence of new investment in wells to maintain production. The only significant increase in production capacity has been due to sugarcane bagasse cogeneration, which can only be relied upon during the sugar harvest (or requires running on oil).

2.3 The supply and demand balance has deteriorated. Maximum demand has increased at a rate of roughly 4 percent per year since 2001, and the system's reserve margin has become inadequate. During mid-2006 the reserve margin was only 30MW, or roughly 6 percent of demand, which is inadequate for reliable load supply. Consequently, there were systemwide blackouts, with daily power rationing lasting several hours. The situation has improved in 2007 with the installation of generating capacity sponsored by the Venezuelan Government, which should add up to 60MW of new (albeit expensive) generation.

2.4 In addition to covering peak load, the system should be able to supply overall energy demand. Because of small storage capacity, hydro production is highly variable, as shown in Table 2 (for example, 426GWh in 2005 compared to only 300GWh—30

percent less—one year later), and the role of reserve thermal capacity becomes even more critical, which adds to the volatility of costs associated with oil prices.

Table 2: Electricity Generation, by Type (GWh), 2001–06

Power Stations	2001	2002	2003	2004	2005	2006
Thermal (fuel and diesel oil)	1,890	1842	1893	1,981	1,868	2,058
Hydroelectricity	190	296	292	311	426	299
Thermal (bagasse cogen)	34	96	134	128	203	194
Geothermal	188	191	242	227	241	277
NIS TOTAL	2,302	2,425	2,561	2,647	2,738	2,828

Source: INE.

Table 2 clearly illustrates how the system is highly dependent on oil-based resources for over 70 percent of its energy production, thereby rendering it more vulnerable to increases in oil prices.

2.5 At the distribution level, supply is provided by DISNORTE and DISSUR. Both companies were acquired by *Unión Fenosa* (UF) during the privatization process; UF supplies the principal cities in Nicaragua and a large number of rural users. There are some isolated systems, which are very small and are supplied by ENEL, the state electricity company, or by small private companies or nongovernmental organizations. Isolated systems account for less than 1.5 percent of total consumption.

2.6 Energy sales have increased significantly. Distribution-level sales during 2001–06 increased at an average rate of around 6 percent per year. In 2006 the increase was 5.1 percent due to the supply constraints at the generation level. Table 3 illustrates the breakdown among consumer categories.

Table 3: Annual Energy Sales, by Consumer Category (GWh), 2001–06

Consumer Type	Year					
	2001	2002	2003	2004	2005	2006
Domestic	448	460	507	551	592	633
Commercial	375	391	487	511	541	571
Industrial	351	356	354	337	362	382
Public lighting	40	36	54	67	70	71
Irrigation	88	76	64	67	66	66
Government	77	92				
Pumping loads	170	162	157	155	150	151
Large consumers		70	111	142	151	157
Bluefields system	12	12	12	13	14	15
Wiwilí system				0.43	0.56	1.3
NIS Total	1,561	1,655	1,746	1,843	1,946	2,047

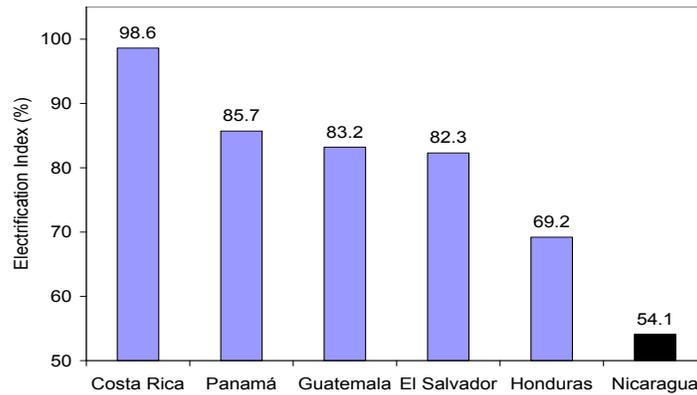
Source: INE.

2.7 Distribution losses have persisted despite privatization. The difference between Tables 2 and 3 corresponds to distribution losses. Preliminary data for 2006 yield 27 percent losses with respect to net production. This is one of the main failures in the system and the major reason behind the system's unacceptable financial performance. During 2000–05 loss rates declined from 32 percent to 29.5 percent, but this is widely seen as far too small, particularly for a privatized system.

Access and Electrification

2.8 **Nicaragua has the lowest access rate in the region.** According to data from the United Nations Economic Commission for Latin America and the Caribbean (ECLAC), electrification in Nicaragua was around 47 percent in 2001 and 54 percent in 2005, which shows impressive progress during the last five years. This is due in good measure to the organization of *Fondo de Desarrollo de la Industria Eléctrica Nacional* (FODIEN) and its electrification programs, which have benefited from the support of donors and multilateral organizations. Nevertheless, Nicaragua’s electrification rate is the lowest among the Central American countries (Figure 1).

Figure 1: Electrification Rates for Central American Countries, 2005

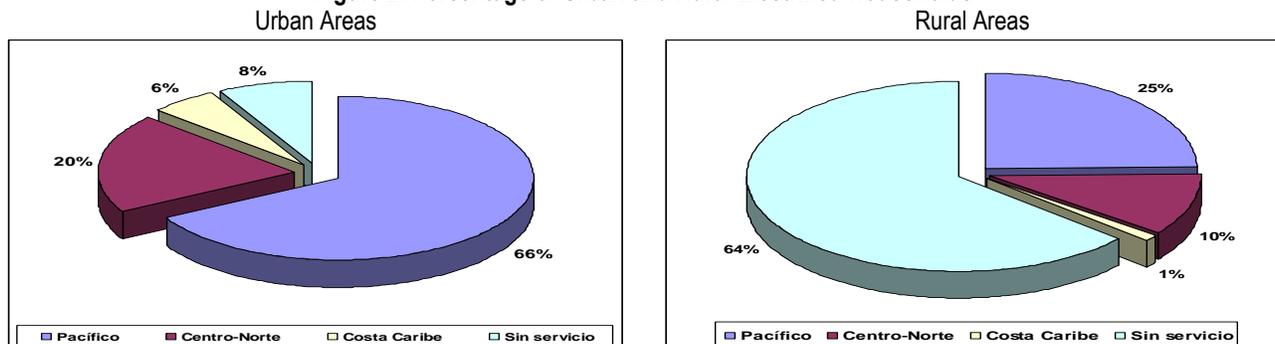


Source: ECLAC.

2.9 The data of Figure 1 could misrepresent Nicaragua’s electrification rate: according to the 2005 census, around 68 percent of all dwellings have electricity service. This figure differs from the ECLAC value based on the number of consumers and pre-census data regarding persons associated to each customer. This methodology yields a different estimate because it ignores the number of illegal residential connections that are not taken into account in official utility data. However, whatever the methodology, Nicaragua still appears as the country with the lowest electrification rate in the region.

2.10 The census figures also yielded an electrification rate of around 92 percent in urban areas, but of only 36 percent in rural ones, as shown in Figure 2.

Figure 2: Percentage of Urban and Rural Electrified Households



Source: 2005 Census data.

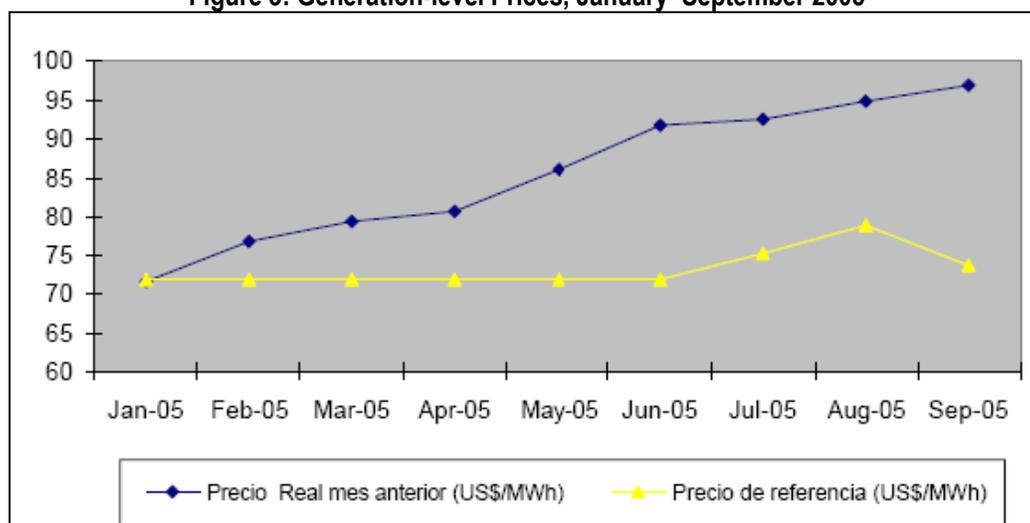
The wholesale market and the formation of generation-level prices

2.11 **The electricity law and its secondary legislation established a wholesale market and its pricing rules.** Distributors are obliged to contract at least 80 percent of expected demand for the current year and at least 60 percent for the following year. The difference between contracted demand and actual demand is supplied by the short-term (spot) wholesale market.

2.12 Price in the wholesale market is calculated on an hourly basis by equating it to the marginal cost in an unconstrained spot market, under actual conditions of supply (that is, plant availability) and demand. Variable costs of thermal plants are calculated on the basis of allowed efficiency and fuel prices. Until 2004 the spot market only accounted for around 10 percent of all energy transactions, but it increased to around 25 percent in 2005.

2.13 **Market prices have tracked the oil price but they have not been reflected in the tariff.** Generation costs are passed on to consumers with some smoothing intended to reduce volatility. Differences—either positive or negative—accumulate and are supposed to be compensated through appropriate tariff adjustments. Generation costs became critical in 2005 with the increase in the oil price. Figure 3 shows how the generation price paid by distribution companies increased from around US\$72/MWh in January to US\$97/MWh in September—a 30 percent increase. In contrast, the reference generation price that INE calculates and allows to be transferred to tariffs was only increased twice during the year, for a total of slightly over 5 percent. The reference price shown in Figure 3 corresponds to the cost accepted by the regulator as a pass-through to consumer prices. In 2005 the two values diverged by over US\$20/MWh, that is, it was around 20 percent below the price paid the distribution company.

Figure 3: Generation-level Prices, January–September 2005



Source: INE.

2.14 **During 2006 INE introduced a correction in the right direction.** Table 4 illustrates how the gap has been progressively reduced as far as the pass-through price for any given month. The negative values of September and October 2006 have been

maintained in late 2006 and early 2007, which has contributed to reducing the accumulated losses of previous periods.

Month	Real price (US\$/MWh)	Approved Price (US\$/MWh)	Difference (US\$/MWh)	Loss-adjusted Difference (+14%)	Percent Shortfall
Nov–05	94.04	82.43	11.61	13.24	12.35%
Dec–05	92.80	85.94	6.86	7.82	7.39%
Jan–06	98.48	92.15	6.33	7.22	6.43%
Feb–06	100.81	92.15	8.66	9.87	8.59%
Mar–06	100.2	94.77	5.43	6.19	5.42%
Apr–06	104.82	97.00	7.82	8.91	7.46%
May–06	108.72	100.00	8.72	9.94	8.02%
Jun–06	112.38	103.88	8.50	9.69	7.56%
Jul–06	113.01	103.88	9.13	10.41	8.08%
Aug–06	113.57	107.99	5.58	6.36	4.91%
Sep–06	102.3	107.99	-5.69	-6.49	-5.56%
Oct–06	100.65	107.99	-7.43	-8.37	-7.29%

Electricity pricing and subsidies

2.15 **The basic tariff scheme is similar to others in the region.** Final customer prices are made up by an allowed pass-through price for generation-level costs—as pointed out above—plus a value-added component for distribution investments (VAD), a transmission charge, and supply and client-related costs. Consumer tariffs are calculated using efficient operating standards, including:

- Efficiently bid-out contracts by the distribution company;
- Adequately maintained and operated distribution assets; and
- Capital costs based on a rate that reflects commercial costs and risks of operating in Nicaragua.

Consumers are classified according to their demand characteristics, and tariffs for each customer class are calculated according to typical parameters obtained from their corresponding load curves.

2.16 **The tariff structure is overly complicated.** Although the general pricing principles are common to many countries, the existing tariff structure is considered complex, with an excess of categories and different charges. A tariff restructuring which would have simplified the schedule was planned for 2005 and was supported by in-depth studies, but it was never implemented. For example, the existing structure has a total of 24 low voltage (LV) tariffs, and 11 medium voltage (MV) tariffs. This complex structure is inefficient, complicates the commercial process, confuses the customers, and is against the tariff simplicity principle established in the electricity legal framework. Furthermore, the excessive number of categories and charges does not correspond to differences in cost.

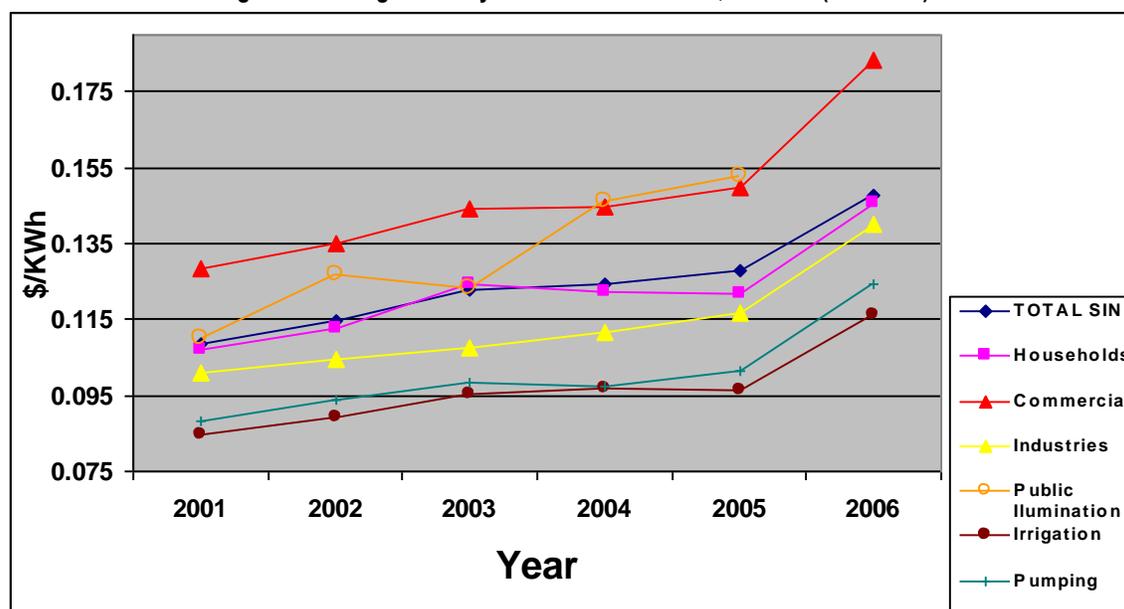
2.17 Table 5 and Figure 4 show average prices for different consumer categories.

Category	2001	2002	2003	2004	2005	2006
Average	10.8	11.5	12.3	12.4	12.8	14.8
Domestic	10.7	11.2	12.4	12.2	12.2	14.6
Commercial	12.8	13.5	14.4	14.5	15.0	18.3
Industrial	10.1	10.4	10.7	11.1	11.7	14.0
Public lighting	11.0	12.7	12.4	14.6	15.3	0.0
Irrigation	8.4	8.9	9.5	9.7	9.6	11.6
Pumping	8.8	9.4	9.8	9.8	10.2	12.4

Source: INE.

The challenge consists of rehabilitating the system in order to reach a degree of service commensurate with the price being paid by customers.

Figure 4: Average Price by Consumer Subsector, 2001–06 (US\$/kWh)



Source: INE.

A striking feature is the increase in prices during 2006, compared with the 2004–05 values. There appears to be an important cross-subsidization element, with industrial, pumping, and irrigation prices well below average, (irrigation and pumping tariffs did not cover wholesale prices in 2006), residential prices near-average, and commercial prices well above.

2.18 These prices are by no means low; in fact, they are now among the highest in the region. Figure 5 illustrates average residential prices in Central America, with Nicaragua below El Salvador, Guatemala, and Panama, but far above Costa Rica and Honduras, and Figure 6 shows how industrial prices are the highest of the region.

Figure 5: Average Residential Prices in Central America (US\$/MWh)

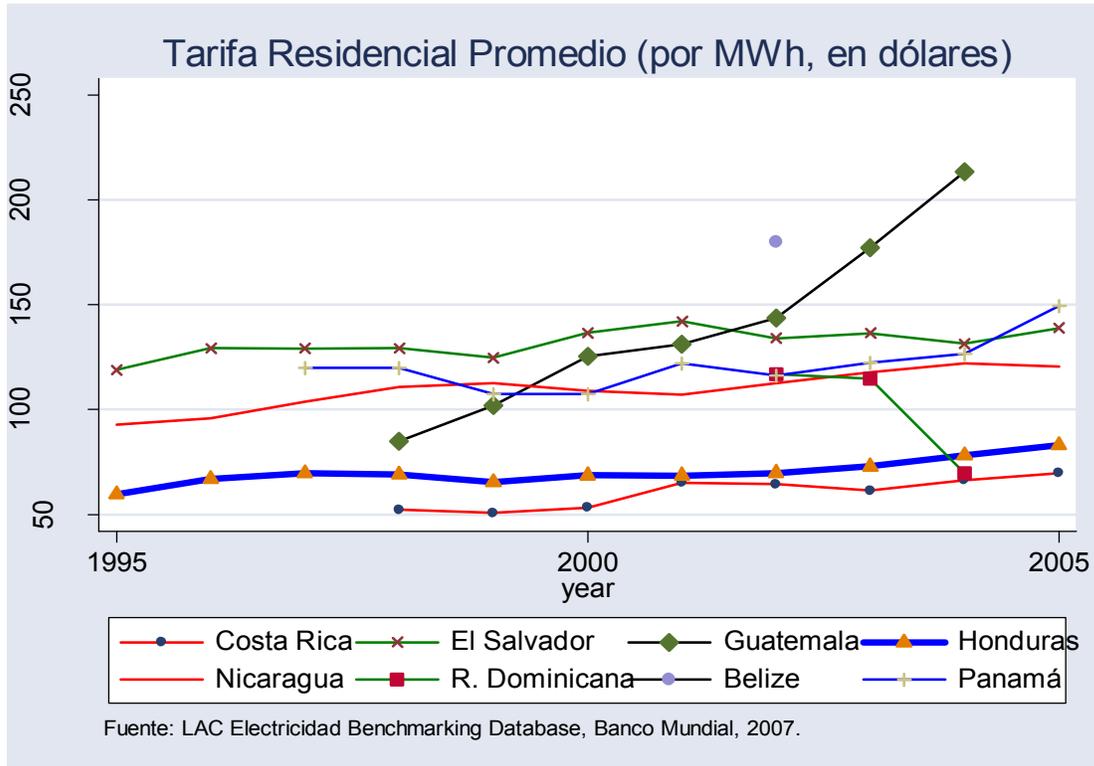
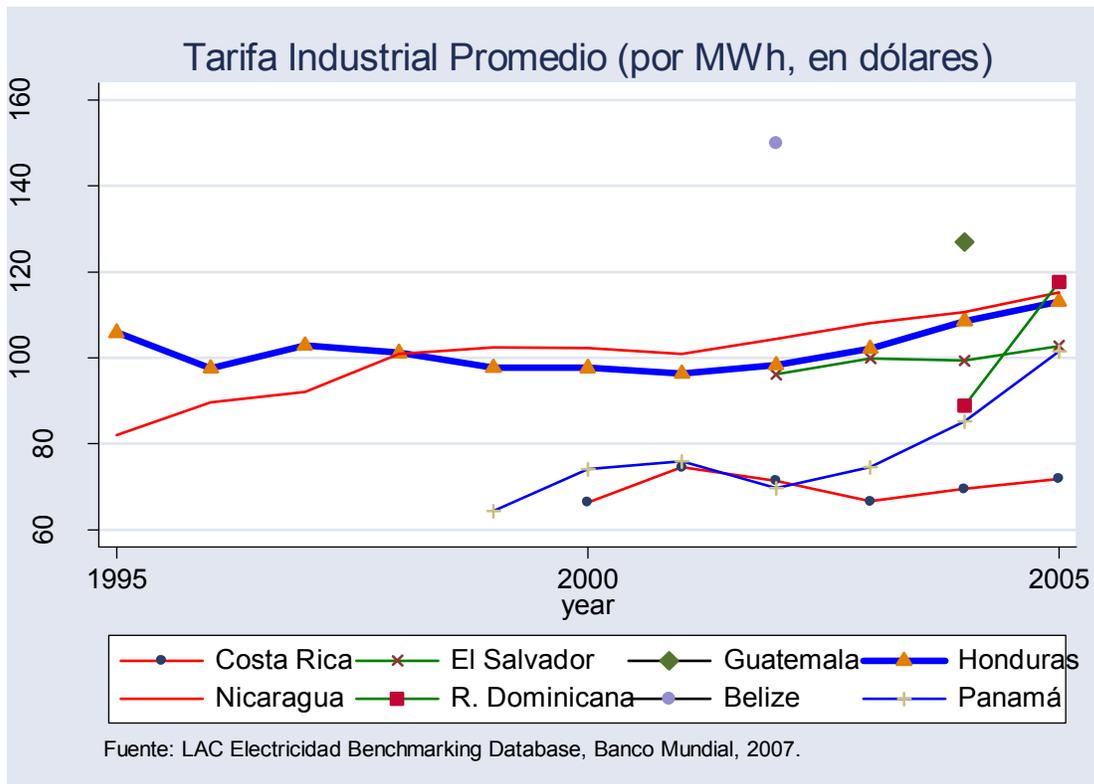


Figure 6: Average Industrial Prices in Central America (US\$/MWh)



2.19 A further breakdown of final tariffs by component is shown in Table 6.

Component	2001	2002	2003	2004	2005	2006
Generation	5.5	5.8	6.3	6.7	7.5	9.4
Transmission	0.4	0.4	0.4	0.4	0.4	0.4
Distribution	4.9	5.3	5.6	5.3	4.9	5.0
Total	10.8	11.5	12.3	12.4	12.8	14.8

Source: INE statistics and own calculations.

In 2001, shortly after privatization, costs were roughly shared equally between generation and transmission/distribution. With increasing oil prices, generation now accounts for 64 percent of the final price to the consumer, which brings to light the need to find new and more economical generation alternatives if prices are to be kept at reasonable levels.

2.20 Cross-subsidies pervade the tariff scheme. The present tariff structure provides for Medium Voltage (MV) consumers (i.e. large industries or businesses) to pay tariffs in excess of supply costs and thereby provide a cross-subsidy to the group of Low Voltage (LV) consumers (i.e. small users, including the domestic subsector) whose tariff is below the cost of supply. In 2004 MV customers provided about US\$7 million in cross-subsidy to LV customers. The cost of the subsidy to the productive sector (which is the main category of MV users) was equivalent to a tariff surcharge of 18 percent, which clearly penalizes competitiveness. Despite the high cost to larger users, because of the large number of LV customers, the subsidy represents only a 4.4 percent decrease in the latter's average price.

2.21 Within the LV category, which covers domestic and small commercial and industrial users, there are further cross-subsidies. Users that consume below 150kWh/month (83 percent of all LV users) benefit from users whose consumption exceeds this value. With this scheme, the lowest consumption users (0-50kWh/month) benefit from reductions of about 45 to 63 percent in their average tariff—which is a substantial and significant benefit to the poor. However, consumers above the 50kWh level also benefit from the subsidy, which results in bad targeting. In fact, benefits to the really poor could be substantially increased by limiting the beneficiaries of the subsidy to those below 50kWh. The limit for subsidizing electricity consumption is a matter of much debate due to its political connotations; compared to other countries in the region, the threshold in Nicaragua is substantially lower than those in Panama, Guatemala, or Honduras.; however, in a poor country with low coverage such as Nicaragua, it can be argued that *any* subsidy is regressive, and a limit of 50kWh/month would be reasonable.

2.22 Limiting subsidy benefits could also allow a reduction in the cross-subsidy burden for MV users, thereby improving the competitiveness conditions of the productive subsector. The total cross-subsidies within the LV residential category amount to around US\$6.5 million, most of which (US\$3.7 million) are extracted from users with use in excess of 100kWh/month.

3. POWER SECTOR ISSUES AND OPTIONS

The preceding snapshot brought to light many of the problems facing the power sector, and this section approaches them in greater detail. They include:

- (a) The question of financial sustainability;
- (b) The stability of the legal framework and the need for predictable regulation;
- (c) Questions surrounding security of supply;
- (d) Substituting oil-consuming facilities, that is, improving the energy matrix;
- (e) Improving access; and
- (f) An examination of the fiscal consequences of different ways in which to deal with the crisis.

3.1 **Several power sector reforms have failed.** The World Bank, the Inter-American Development Bank (IDB), and ECLAC have conducted several analyses regarding power sector reforms in Latin America in general and in Central America in particular. A general conclusion is that reforms did not have the expected results. Reform helped to overcome the extended crisis of the 1980s, to organize the sector, and—at least initially—to attract important investments in the region. However, at least since late 2000, a progressive weakening in the reform process became evident, leading in several cases to a crisis.

3.2 In Nicaragua, with the existing loss and theft levels, the financial viability of the distribution companies could be questionable. As the cash register of the sector, any difficulties in billing or collecting have upstream consequences, affecting both generators and eventually fuel suppliers, and a prompt solution to their problems must be sought to ensure service continuity. However, the scant progress shown by the distributors in seven years and the continuous confrontation have eroded the trust among the company, its consumers, and the Government to a level that makes it particularly challenging to reach the agreements required for a lasting solution.

3.3 **Nicaragua is not an exceptional case.** The friction between INE and the sector companies should be addressed with a view to finding common ground and seeking an understanding to solve the sector's problems. The problem is by no means exclusive to Nicaragua, and many Latin American countries have encountered similar situations in the application of sector laws and regulations; it stems, among other things, from weak organizations, lack of transparency in regulatory processes, difficulties in regulating powerful multinational corporations, and general institutional weaknesses.

3.4 While the creation of MEM solves to a certain measure the rivalries and lack of coordination between CNE and INE, it is far from being a panacea for the institutional problems. The reform processes clearly underestimated the difficulties of putting in place a framework that was alien to the traditional institutional organization in many countries, such as independent regulators. The political crisis of the last four years showed that regulatory institutions do not function in a vacuum and that politicians will intervene whenever they feel their power threatened. A solid consensus among different

branches of government on how to deal with the power sector is essential for any durable solution.

3.5 Although there are multiple reasons behind the crisis, a common trigger, which is particularly relevant for Central America and the Caribbean, lies in the increase in oil prices. Nicaragua is particularly vulnerable in this aspect, because it has the smallest power system and the most dependent on thermal generation in Central America, with expensive small and inefficient plants. To avoid tariff increases, many governments intervened in the sector, or did not allow the regulated formulas to be applied. In Nicaragua there was a permanent tariff lag, which has been partially corrected in 2006.

Achieving financial sustainability of distribution

3.6 To address the problems of the distribution subsector, two different problems should be distinguished: tariff lags on one hand, and losses on the other. Tariff lags originate due to differences between the ex ante approved tariff and the ex post actual price, which is influenced mainly by the short-term market and the purchase price of energy in the spot market. This problem is exogenous to the distribution company, which is powerless to address it. A well-designed regulatory system would insulate the distribution subsector from this problem through an effective pass-through mechanism. In Nicaragua the procedure of passing generation costs to the tariff is ineffective, with lags of up to a year, which results in financial losses for the distribution companies.

3.7 **Tariff lags have run up deficits which have been cancelled on an ad hoc basis.** Table 7 shows “real prices,” that is, as calculated by INE according to the regulatory rules, and the actual approved values for 2001–06, broken down by components, that is, the energy purchase price at medium voltage, the allowed margin for losses, and the distributor’s allowed margin. Until 2003 differences were small; in 2004 a first appreciable difference of 2.4 percent appears and in 2005 the difference increases until it reaches 9.3 percent below the approved value, creating an important tariff lag.

Table 7: Real Price and Approved Tariff, 2001–06 (US¢/kWh)

	2001		2002		2003		2004		2005		2006*	
	Real	Tariff										
MV Bus ¹	6.3	6.2	6.7	6.6	7.1	7.2	7.4	7.2	9.0	7.6	10.6	10.0
Losses	0.9	0.9	1.0	1.0	1.1	1.0	1.1	1.1	1.3	1.1	1.5	1.4
VAD ²	3.9	3.9	3.9	3.9	3.9	3.9	4.1	4.1	4.1	4.4	4.4	4.4
Total	11.1	11.0	11.6	11.6	12.2	12.1	12.6	12.3	14.4	13.1	16.5	15.8

* Until August 2006.

¹ Medium Voltage.

² Distribution Margin (*Valor Agregado de Distribución*).

Source: INE.

Since mid-2005 regular increases have taken place each month until August 2006, when the average price reached a level in excess of US16¢/kWh. As shown in Table 4, the real price has decreased and currently the approved tariff may be on the order or even slightly above the real price, which would justify the lack of additional adjustments.

3.8 Tariff lags from October 2003 to September 2005 were cancelled by the Government through a US\$36 million payment, of which US\$18.3 million was balanced

through debts of the distributing company to ENEL. Due to disagreements between INE and the distribution company, the tariff lag from October 2005 to December 2006 has yet to be agreed upon; the distribution company sets the value of the tariff lag at US\$21 million as of August 2006.

3.9 The regulator—and by implication the Government—is responsible for deficits due to tariff lags. Restoring the sector to a stable financial footing requires that the 2006 tariff deficit be addressed and that corrective action be taken to avoid its persistence in the future. However, it is not just a matter of improving the “pass-through” mechanism but may also include a new tariff structure and better subsidy targeting.¹

3.10 **Losses are at the heart of the sustainability problem for distribution.** The distribution company reports losses of about 28 percent of net generation, which is approximately double the amount of admissible losses in a well-run distribution operation. A simple calculation provides some insight based on 2006 values comparing them with a hypothetical case in which only 14 percent losses obtain.²

Net Generation	2828GWh
Actual Consumption: 2828x0.86	2432GWh
Expected Receipts: 2432x158.21	385MUS\$
Sales	2048GWh
Actual Income: 2048x158.21	324MUS\$
Cost of Foregone Sales	61MUS\$
% of Actual Gross Income	19%

When perceived as an integrated system, losses amount to 19 percent of cash coming into the system. However, the effect on the distribution company’s cash flow is vastly greater:

Gross Distribution Income	324MUS\$
Upstream Cost: 2828x100.04	283MUS\$
Net Distribution Margin	41MUS\$
Cost of Foregone Sales	61MUS\$
% of Net Distribution Margin	150%

In a less optimistic scenario, not all commercial losses become effective sales. Assuming that all avoided losses will result in less energy bought, thus keeping sales constant, then the savings from less wholesale energy purchased would be around US\$40 million. The true increases in gross operating margin from eliminating unmetered consumption would be between US\$40 million and US\$61 million.

From the latter, the distribution company could increase its net income between 100 percent and 150 percent if it addressed the loss problem successfully. Assuming that the distribution operation has costs of roughly 50:50 between fixed and variable, it is

¹ Parliamentary opposition blocked an initiative of the Bolaños government to raise tariffs to all but the poor.

² This analysis assumes that all losses over 14 percent will become new sales. This is optimistic. Some will represent less wholesale energy bought and some more retail energy sold. Because consumers will face larger effective prices, they will adjust their consumption accordingly.

barely able to cover variable costs with its current income, and it inevitably reports accounting losses with no resources left over to contribute to investment.

3.11 Taking a closer look at the problem, if the “admissible loss” of 14 percent corresponds to technical losses it would amount to around 400GWh. This is vastly above common values found in the region. Estimates indicate that they should actually be on the order of 10 percent for systems with average efficiency. In the case of Nicaragua, with high generation costs, this threshold may be even lower because the system can support larger investments for loss reduction. Reducing technical losses is clearly the distribution company’s responsibility, and it requires investments which, under the present financial circumstances, are not feasible. The problem may require further capitalization of the company.

3.12 **UF considers the slum problem to be intractable.** As for the remaining losses, unmetered consumption (which should be reduced to zero), the alternatives for solving the problem are more complex. Although they may not necessarily require major investments (as shown elsewhere, for example, in Bogotá, Colombia), they may require network reconstruction to improve quality of service. Around 7 percent of energy delivered to the distribution network, equivalent to around 200GWh, corresponds to theft in subnormal settlements (that is, slums—*asentamientos progresivos*) where the distribution company is unable to establish commercial practices. The distribution company has given up trying to reduce these losses and expects the Government to “take charge” of them. In practical terms, the distribution company is proposing that the Government pay the upstream cost associated with these losses; the cost to the Government would be approximately (200GWh @ US\$100.04/MWh), or US\$20 million per year. The cost to the distribution company would be the foregone income from its value added (200GWh @ US\$44.16/MWh) or around US\$9 million.

3.13 The most recent discussions have included the possible formation of a new power company with Government and *Unión Fenosa* participation to provide service to the *asentamientos*. This could be a good alternative because it would no longer be the existing companies that would provide the service, and consumers might well be more receptive to it and consider it a fresh start for receiving adequate supplies. However, whether it is a new company or the existing one, success in providing adequate service under financially sustainable conditions will depend on the methods used to address the problem, which require a fresh approach.

3.14 **The problem has been successfully addressed elsewhere.** UF's proposal for addressing the problem is not appropriate in the long run and alternative approaches have been shown to be effective. The problem is that most losses in slums are due to a poor quality of the network, and it is difficult to change behavior without investing in service improvement. CODENSA, the distribution company serving Bogotá, Colombia, tackled the problem successfully (Box 1). Customers must see a real improvement in service quality and commercial practices to respond, trust the company, and pay.

Box 1. Loss Reduction in Bogotá

In 1997, Chilean investors took over the management of CODENSA, the distribution utility in Bogotá. At the time, commercial and technical losses amounted to around 24 percent of energy delivered to the network. The company reduced losses to around 10 percent in three years. Currently, they are 8.6 percent.

The key to CODENSA's success lies in a willingness to adapt to circumstances and to make the investments required to improve performance. Despite experience in dealing with the problem of losses in Buenos Aires, Lima, Rio de Janeiro, and Santiago, management quickly realized that Bogotá presented a different challenge. Of 1.6 million customers, around 300,000 lacked meters, and about 400,000 users were located in shantytowns where connections were illegal and precarious. There was also widespread fraud among all customer classes.

CODENSA initiated its loss-reduction strategy with a program oriented toward poor neighborhoods. Its basic approach was to reach an agreement with the potential beneficiaries and to explain the nature of the work being undertaken and the benefits that the company could offer, such as improved connections, better service, and public lighting for safer streets. Only communities willing to cooperate benefited from the program, and written agreements were signed where rights and obligations of the beneficiaries were spelled out. Working closely with the communities was a key aspect of the program, and after three years 349,000 customers had been legalized at a cost of US\$76.4 million (around \$220 per customer, on average).

Two other programs targeted service normalization and fraud control in established neighborhoods (369,000 customers at a cost of US\$35 million, equivalent to US\$95 per customer) and large customers (8,000 users, US\$2.8 million, equivalent to \$350 per customer). The additional revenues from loss reduction were equivalent to the net income of 2000 (the year they were completed). CODENSA has been active in preventing backsliding by creating incentives for customers to remain loyal to the company, for example, by providing credit for purchasing household appliances and instruction on energy-saving measures. As a result, poor customers now rate CODENSA's services better than other customer classes.

The programs were successful because CODENSA had the resources to invest in them and proceeded to immediately tackle the problem, and also because Colombia's subsidization scheme helps to reduce the financial impact of becoming a mainstream consumer, particularly among the poorest.

3.15 The last 7 percent, or around another 200GWh, has been accepted implicitly as the distribution company's responsibility (for example, faulty meters, unread meters, theft from large companies). The latter has indicated that nonetheless, it requires government support to address the problem, which is mainly associated with theft, but the existing legal framework does not facilitate dealing with it (for example, cutting off users and prosecuting illegal connections). As in the case of technical losses, the distribution company should agree to a loss-reduction plan with reasonable milestones in the medium term; *Unión Fenosa* is a large and experienced enterprise, and such a program should be feasible.

3.16 Finally, the calculations shown above are estimates and require further refinement. A rigorous and independent loss study should be conducted to clearly identify the magnitudes and pinpoint the sources of losses. It should be the basis for establishing the programs required to reduce technical and non-technical losses. The Nicaragua case is certainly complex, particularly because six years after privatization the problem has been allowed to fester, and trust between the company and consumers is at a low point. This state of affairs cannot continue indefinitely and requires a concerted effort by the Government and by the distribution company to address it.

Establishing a stable legal framework and predictable regulation

3.17 **The elements of reform followed “best practices” at the time.** The 1998 laws reforming INE and putting in place the Electricity Law were the basis for power sector restructuring and constitute the legal framework for the sector. INE was converted to an autonomous state entity with financial and administrative independence. INE’s directorate comprises three members appointed by the National Assembly from candidates nominated by the President of the Republic. They are appointed for staggered six-year terms. Secondary legislation promulgated by INE complements the basic sector laws through seven directives which cover operations, transmission, licenses and concessions, service quality, fines, and tariffs. They were designed with the support of international consultants and the financial support of IDB.

3.18 **The road to reform was paved with the best intentions.** Prior to privatizing distribution, INE published tariff norms and schedules for 2000–01 and 2002–05, which constituted a basis for the bidding process. A transition period to reach a more efficient tariff structure was established. A three-phase process was envisioned: Phase I included the application of tariff schedules established for privatization; Phase II (2002–04) envisioned tariff restructuring, including the elimination of most cross-subsidies among subsectors, while maintaining a degree of cross-subsidization within the domestic category; Phase III, from 2004 and until the first tariff review of distribution prices, would finalize the application of the new tariff scheme.

3.19 The proposed tariff schedules considered reference production prices, with modifications (starting in Phase II) to take into account the difference between real prices and reference prices. The schedules established an indexation of distribution costs during Phase II. Energy prices were to be revised every 12 months and implemented in May of each year. The regulator was empowered to revise them more frequently if warranted by the impact of wholesale prices.

3.20 **Reality fell widely short of the mark.** Barely two years after privatization of distribution, the procedures established to transfer wholesale prices to tariffs were not followed. In January 2002 the Phase II adjustments should have been implemented, and in May 2002 the tariff should have been recalculated to reflect wholesale deviations between October 2000 (when privatization took place) and April 2002. Neither of these events materialized; a 10 percent tariff adjustment required to reflect wholesale prices was not implemented, and INE ignored the Phase II tariff adjustments.

3.21 The application of the tariff rules encountered widespread political opposition, due in good measure to the expectation that privatization would increase efficiency and lead to reductions in price to final consumers. As these did not materialize, due to fuel price increases and the inability of the distribution company to come to terms with the losses problem, relations between the regulator and the distribution company became ever more tense; in June 2002 an agreement was reached but it was only partially put into effect due to objections voiced by the regulator.

3.22 Although the legal framework in Nicaragua differs little from those in other Central American and South American countries—where similar problems have been encountered—its application in Nicaragua has been much less satisfactory than elsewhere. There is little doubt that the framework requires revision, but this would have little effect if it is not accompanied by the political will to establish corrective measures. In fact, the regulatory problems in Nicaragua were a direct reflection of the antagonism between the Executive and the Legislative branches during the last administration; the situation reached a point where there were two regulators—one appointed by the Government and another appointed by the National Assembly.

3.23 **A first step toward institutional strengthening has been taken.** The establishment of the Ministry of Energy and Mines is an important first step in reestablishing governance in the sector, with a clearly empowered policymaker, which eliminated the intrinsic weakness of CNE and limiting INE to its regulatory and supervisory functions. This should be accompanied by a strengthening of the regulator as an independent, technical, competent, and transparent entity with as little discretionality as possible.

3.24 **But the road ahead is long.** Problems remain in finding qualified local candidates for both the ministry and the regulator and clarifying their roles. Also, the Electricity Law may need amendments to remedy old and new flaws. A key issue is reestablishing trust, which requires a government playing by the rules and a private sector willing to reach agreements with the Government that minimize incentives for opportunistic behavior.

Security of supply

3.25 **Most generation capacity (70 percent) is now in private hands.** The state still maintains two companies, *Generadora Eléctrica Central S.A.* (GECSA) and *Generadora Hidroeléctrica S.A.* (HIDROGESA). Although private generation was allowed in 1992, it was only in 1997 that the first private plant began operations (*Corporación Eléctrica Nicaragüense S.A.*). After the 1998 reforms, state-owned assets of ENEL were purchased by private sector companies and new plants were installed (Table 8). In 1999 three plants totaling 185.5MW were installed. Thereafter there have been only two additions, in 2002 and 2005, both by the private sector. In summary, since the sector was reformed, there has been only one small 10MW investment oriented toward supplying the National Interconnected System (NIS) load. Other private investments were oriented mainly to supplying specific industrial demands.

Table 8: Private Generators in Operation

Private Power Stations	Capacity (MW)		Operating Since
	Nominal	Effective	
Corporación Eléctrica Nicaraguense (CENSA)	63.90	56.85	1997
Empresa Energética de Corinto (EEC)	74.00	70.50	1999
Tipitapa Power Company (TPC)	52.20	50.90	1999
Nicaragua Sugar Estates Limited (NSEL) ¹	59.30	30.00	1999
Ingenio Monte Rosa S.A. (IMR) ¹	67.50	30.00	2002
Polaris Energy Nicaragua, S.A. (PENSA)	10.00	7.45	2005
TOTAL	326.90	245.70	

¹Nominal capacity is available during sugar harvest.

Source: INE.

3.26 Effective capacity has declined since 2003. Data from the last five years regarding the effective capacity in the NIS shows that, apart from an important contribution by sugar estate producers (around 94MW between 2001 and 2005) there were no significant new additions to generating capacity. Indeed, there was a reduction of capacity in some cases (22MW reduction from GECSA in 2004 and 27MW from auto-producers in 2006). The net result yields an effective capacity in the NIS in 2006 that is lower than that of 2003, and only 10 percent above the effective capacity in 2001. During the same period, peak demand increased by slightly above 20 percent.

3.27 If a similar increase is projected for the next five years, at least 110MW of new capacity are required to serve the load, including reserve requirements. Energy production requirements are slightly higher (energy demand has grown at an average 4.2 percent, slightly faster than peak demand), but total production actually decreased nearly 3 percent in 2006 compared to 2005 due to supply restrictions.

3.28 The regional market has provided sporadic support. When the supply has undergone a crisis, *Unión Fenosa* has bought energy from Panama and Costa Rica using the existing interconnection lines for amounts of about 30MW. However, the company's weak financial situation could be an obstacle to depending on this source of supply in the long term.

3.29 In the short term there appears to be a solution. Due to the restrictions during 2006 and the expected situation in 2007, particularly when the sugar harvest ends around April or May, the new Government has decided to install 15MW in diesel units on the basis of a first stage of assistance from the Venezuelan Government.³ Although specific details are still lacking, a second phase would include an additional 45MW. If this can be accomplished, short-term generation requirements will have been accomplished (specific details regarding the economic conditions still have to be agreed upon).

3.30 The medium and long term are still very uncertain. The last indicative plan produced by CNE for 2005–16 indicates an important hydro potential with prefeasibility studies on the order of 700MW (Copalar, in particular with 150–350MW), together with geothermal capacity of about 165MW in San Jacinto-Tizate and Hoyo-Monte Galán. However, any important hydro development cannot be limited to supplying internal

³ See Oil Subsector Annex of this note for a more comprehensive description of Venezuelan support.

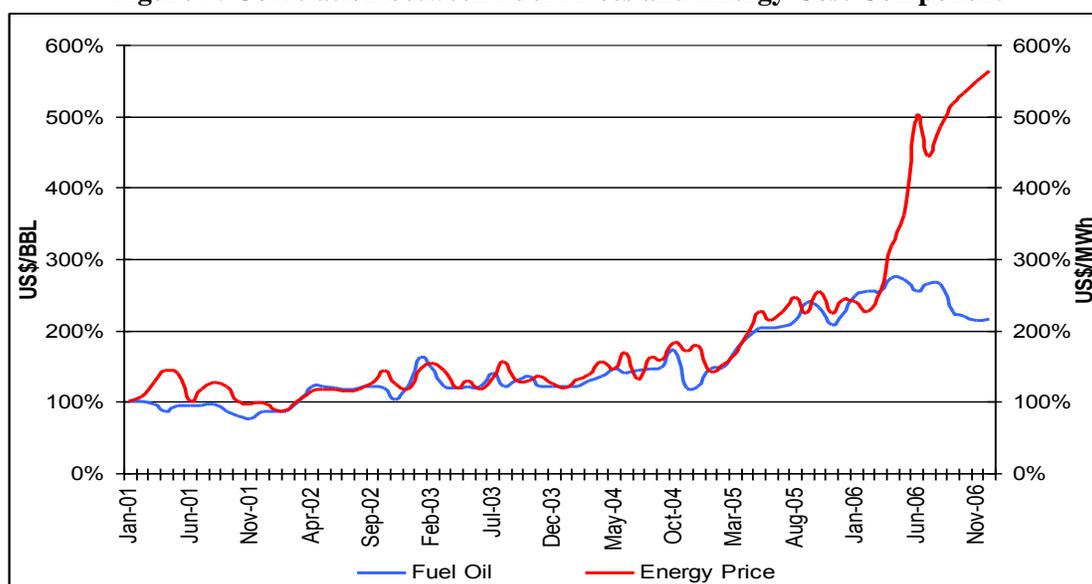
demand and will only be feasible within a wider regional context. Integrated scenarios are difficult to evaluate due to the multiplicity of interests involved, and uncertainty regarding supplies from Colombia and Mexico through the *Sistema de Interconexión Eléctrica para América Central* (SIEPAC) interconnection line (due in 2009).

3.31 Due to its relatively small size and its location at the center of the Central American regional market, Nicaragua could benefit from economies of scale and improved technology from power plants located either in the country or the region. Indicative planning results show that Nicaragua has a number of medium-sized developments that could be part of a regional integration scenario.

3.32 **Supply from within Nicaragua is a possibility.** According to CNE's (now MEM) studies, a least-cost scenario would involve an investment of around US\$280 million in the next 10 years, based on a combination of different resources, such as small hydro (Larreynaga, Pantasma, Pajaritos, Valentín, Corriente Lira, and El Carmen), geothermal plant (Hoyo 1 and 2), windpower (two 20MW projects), and some thermal generation (2x50MW gas turbines). Of this investment, around US\$100 million would be required for the next five years. However, unless prevailing institutional and downstream issues are confronted quickly, it is unlikely that this investment could be mobilized from private resources.

Improving the energy matrix

3.33 **The power system is too dependent on oil products.** As indicated above, around 75 percent of electricity production originated in thermal power plants using entirely imported, oil-based products, far above the 43 percent average of all Central American countries. Improving the energy matrix for electricity production may reduce Nicaragua's dependence on oil imports and its vulnerability to supply constraints and price fluctuations. Prices on the spot market closely follow oil prices, as shown in Figure 7.

Figure 7: Correlation between Fuel Prices and Energy Cost Component

Source: INE's Data and consultant calculations

This situation lies in strong contrast to the limited production from renewable energy sources, such as hydro and geothermal—which account for only about 20 percent of the total—and the actual potential from these sources.

3.34 Renewables are a realistic option to reduce the dependence on oil. CNE estimates indicate a hydro potential of 1,800MW; studies at different levels exist for around 700MW, but they still lack economic viability and financial support. A survey conducted in 2001 (the Geothermal Master Plan) confirmed the existence of at least 10 areas with geothermal interest, including the existing Momotombo and San Jacinto-Tizate fields. CNE awarded exploration concessions in March 2006 for the El Hoyo-Monte Galán and Managua-Chiltepe areas, which are estimated to yield an additional (new) 165MW. Nonetheless, developing these resources may be expensive compared with alternatives such as improving energy efficiency or using financial instruments to cover volatility. There is a pressing need to update studies and search for alternatives. Other renewable resource initiatives consist of complementing sugar bagasse during the off-season with biomass from eucalyptus plantations; the Pellas group—which already produces ethanol—is investing in one such scheme in a 30MW complex.

3.35 Introducing natural gas to Nicaragua on a large scale is still a remote possibility. Preliminary plans to introduce cleaner and less costly fuels for power production are still on the drawing board. Bringing piped natural gas from Colombia/Venezuela or Mexico to Central America is far from becoming a reality, and in any case the pipelines are unlikely to reach Nicaragua. Compressed natural gas (CNG) and liquefied natural gas (LNG) are two possibilities that require further study. For example, bringing in moderate amounts of CNG from Colombia is feasible, whereas LNG requires relatively complex and large-sized facilities. Possibilities include gas from Peru in the Pacific—where an LNG terminal is planned for 2010—and gas from Trinidad and Tobago or Venezuela in the Atlantic. In any case, Nicaragua's small-sized power

system is a disadvantage compared with other countries in the region when it comes to introducing a new fuel that requires a significant size to be justified. The case of CNG could be different, because CNG freighters can discharge directly from a terminal, and a gasification plant is not necessary. Finally, oil exploration currently conducted by private companies could eventually yield natural gas resources.

3.36 The regional market is a real possibility that merits serious consideration.

As noted above, Nicaragua is one of the countries in the region that can profit from the regional market to reduce its dependence on imported fuels. If, as expected, the regional market creates incentives for investment in new and efficient generation, this source will be available for all the countries. The issues that arise include the question of dependence on external sources, which should be explicitly considered in a new energy policy; lessons in this respect include countries in the region—such as El Salvador, where imports play an important role in supplying demand—or in the Southern Cone—such as Uruguay, which is facing a similar question in relation to imports from Argentina and Brazil.

Improving access and expanding rural electrification

3.37 The slow progress in improving service coverage is a reminder that the reform failed in meeting one of its principal legitimacy tests. Until a solution is found to fix this flaw and make electricity accessible to the most needy, the reform will lack the support required for its sustainability. In particular, the emphasis of subsidies to consumers should be oriented towards service extensions, rather than towards existing consumers: with the currently skewed coverage ratio, as noted before, it can be argued that practically any subsidy to existing users is regressive and could be put to better use.

3.38 As noted, access in Nicaragua is extremely limited. Taking the optimistic estimate from the 2005 census of 68 percent electrification (92 percent urban, 36.5 percent rural), a modest goal would consist of increasing this rate by 2 percent per year (around 20,000 new connections in excess of vegetative growth) in order to reach a coverage of 80 percent in six years. This would require an investment of around US\$15 million (based on US\$750/new connection). MEM (previously CNE) is responsible for rural electrification, together with ENEL. Rural access may be a key element in the legitimization of the model.

3.39 **Institutional obstacles must be overcome.** Currently there is a lack of definition regarding the transfer of electrification assets to the distribution company, which leads to uncertainty regarding their operations and maintenance once they have been completed, and their sustainability. Any mechanism for transferring the assets should be carefully planned to avoid creating a financial burden on the distribution company.

3.40 Rural electrification projects undertaken by private agents have also encountered obstacles in the approval process of licenses or concessions; CNE tried to simplify the procedures before INE with little success, in good measure due to the dysfunctional relationship between the two institutions.

3.41 **Reaching an 80 percent sustainable electrification rate will require a new strategy.** FODIEN, the agency in charge of rural electrification within the Ministry, was reorganized to operate more efficiently and to be able to access financial resources. However, these have been exceedingly modest, and ultimately resources for extending rural coverage have come from within the donor community. Different studies executed with support from the Bank have identified alternative mechanisms whereby the responsibility for rural electrification would be shared by the Government, the distribution company, and private agents. The new Government should develop an integrated strategy toward this end by addressing the obstacles noted beforehand and by supporting the participation of agents other than the Ministry in order to mobilize funds.

Fiscal consequences of the power subsector's performance

3.42 The main fiscal effect deriving from the power sector consists of the gap between the tariff as required by the regulatory rules and the actual price allowed by the regulator. Until August 2006 the gap was positive (that is, the distribution company was owed money), but starting in September 2006 it has become negative, that is, there is currently a compensatory effect.

3.43 As noted, the accumulated tariff gap from October 2003 to September 2005 was reduced by a payment of US\$36 million, equivalent to around US\$1.5 million per month. Although part of the payment was made by balancing debts to ENEL, it nevertheless impacts the public sector if ENEL is considered as part of the latter.

3.44 **During 2006 the tariff gap cost the Government around US\$1.2 million a month.** Currently, the distribution company claims that the accumulated tariff deficit since October 2005 amounted to US\$21 million as of August 2006. The average gap during January to October 2006 was around US\$6/MWh, which translates into around US\$15 million for 2006 (based on allowed sales of around 2,432GWh), without considering the possible compensation during November and December 2006. In fact, the latest estimates as of March 2007 would indicate that there is little compensation due to the distribution company.

3.45 **Nationalization could be costly.** If confrontation with *Unión Fenosa* persists, eventually forcing the company to leave Nicaragua, two possible scenarios could be:

- a. *Unión Fenosa's* claim for expropriation is accepted; in this case, it would be compensated by MIGA for around US\$80 million, and MIGA would claim around US\$59 million from the Government (far higher than the tariff deficit payments to date or expected in the near future); or
- b. *Unión Fenosa* is expropriated by the Government with compensation (in a deal similar to that of the Dominican Republic) for an as yet undetermined amount—which is likely to be in excess of the US\$80 million obtainable from MIGA).

3.46 In any case, the pertinent question is whether running the electricity distribution business could be done profitably under state ownership. The evidence of the 1990s would appear to be contrary to such a hypothesis: high losses were prevalent at the time,

coupled with low prices. A move to state ownership would likely reduce the incentives for keeping prices in line with costs and could create a large fiscal gap. As reported by *Unión Fenosa's* headquarters in 2005, the Nicaragua operation led to losses of €5 million (around US\$6 million at the time), but a closer look would be required to provide a better estimate. Reducing losses under state ownership could also be difficult, because the company would become susceptible to pressure to avoid strong action.

3.47 The existing arrangement contains the financial cost of energy losses within the private sector, and any nationalization of the distribution function would lead to a spillover of losses onto the public sector's accounts. Consequently, the current effect on public sector finances from the power sector is associated with (a) losses from ENEL that are associated with supplies to small isolated systems, (b) losses of the government-owned transmission company ENATREL, and (c) foregone income from waiving the value-added tax to consumers of less than 150kWh/month⁴:

ENATREL losses:	US\$3.5 million in 2007
ENEL losses due to isolated systems supply:	US\$2.5 million (estimate)
VAT waiver:	US\$ 8.9 million in 2006

Thus, the total fiscal cost comes to around **US\$15 million, assuming that the tariff gap has closed.**

3.48 Debts have accumulated between the Distribution Company and ENEL, and they have been partially compensated with debts from other public companies, such as ENACAL, with the distribution company. ENEL's hydro resources (that is, its holding in HIDROGESA) are fully depreciated, which allows the company to accumulate debt with a margin of security, that is, without risking a liquidity crunch. Debts from the distribution company as of end February 2007⁵ were:

ENEL	US\$15.9 million
ENATREL	US\$ 7.1 million
Private Generators	US\$ 5.6 million

The total debt amounts therefore to around US\$29 million. *Unión Fenosa* expects to reduce its debts with ENEL by around US\$12.8 million as follows:

Cash payment	US\$1.7 million
Cancellation of ENEL debt to Unión Fenosa	US\$1.5 million
Cancellation of ENACAL debt via reduction of ENEL receivables	US\$7.8 million
Cancellation of FENOSA debt to GECSA	US\$1.8 million

With these measures the distribution company's debt is expected to fall to around \$15.8 million by the beginning of the second quarter of 2007.

3.49 The recently installed emergency power plants provided by the Venezuelan Government may have fiscal consequences. Albeit opportune and provided "on loan", they may turn out to be permanent, thereby requiring purchase either through loans or lease-to-purchase arrangements.

⁴ Consultant estimates.

⁵ Source: IMF.

4. RECOMMENDATIONS

4.1 **Establishing a constructive dialog.** This is no doubt the primary concern in the very short term. Until December 2006 there was effectively chaos at all levels of the power sector: electricity was not being supplied to consumers, the distribution company was penniless, the generation companies went unpaid, the policymaker did not communicate with the regulator, and the latter was hostage to the National Assembly. Many of these problems persist, but there is a willingness, particularly on the part of the Government and the distribution company, to find a way out of a situation which benefits nobody. Any strategy must also include a dialogue with the consumer to explain the options available and to help move from clientelism to commercial relations.

4.2 **Political endorsement is required to find common ground.** Rather than rely on confrontation, arbitration, or the courts, a constructive approach to reconciling differences, identifying the source of problems, and agreeing on an approach is more likely to achieve a satisfactory outcome. However, this requires a political compromise at the level of MEM and INE in the sense that, without necessarily relinquishing their rights vis-à-vis *Unión Fenosa's* contractual commitments, they accept an objective and independent examination of what has gone wrong. The same goes for *Unión Fenosa* and its claims regarding the Government. A first step toward finding common ground could consist of discontinuing claims from arbitration proceedings or insurance guarantees such as *Unión Fenosa's* claim with MIGA.

4.3 **The private sector's role in electricity supply should be recognized and supported explicitly.** Despite the shortcomings of the reform process, the incorporation of private sector interests into the power subsector freed up public resources that could be channeled towards the social sectors where the Government's presence is required most. This is an accomplishment which should be further maintained by reforms in the power sector's rules—as opposed to favoring a pull-out—and appropriate policies, together with a supporting strategy, are likely to be the appropriate course of action for the Government.

4.4 **A negotiated solution should be based on reliable and up-to-date information.** As noted in the preceding analysis, critical information for reaching a workplan is now merely estimated, and a better understanding and quantification is required. Three initiatives suggest themselves:

- (a) **A study oriented toward quantifying losses** by source and identifying measures to reduce them; terms of reference have been prepared and a source of financing has been identified; the study would be conducted under the PERZA project; the study should have a steering committee headed by the Ministry of Finance, including MEM, INE, and *Unión Fenosa*, which should be put in place as soon as possible;
- (b) **An operational audit of *Unión Fenosa***, which would be oriented toward examining whether the company has complied with its obligations under its concession; technically, this is part of the regulator's functions, but an independent appraisal would facilitate agreements between the Government

and *Unión Fenosa*; financing for this study was offered by the generators and by *Unión Fenosa* itself under the reasonable condition that it be executed as a transparent process; and

- (c) **Clarifying who owes how much to whom:** A better quantification of debt among sector actors, with a clear indication of agreed amounts and disputed items would complement the previous studies in providing a better picture of the sector, i.e. amounts owed by large consumers (including Government) to the distribution company, and debts from the latter to generation enterprises—including those supplying electricity from abroad—and to the wholesale market; and debts from Government deriving from the tariff gap due to past tariff adjustments (or the absence thereof).

4.5 A major component of power sector policy will have to do with prices. The existing subsidization scheme is unfair insofar as it is targeted to both rich and poor consumers; as noted, *any* subsidy to electricity in Nicaragua, given the low electrification rate, is regressive. In any case, there is plenty of background analytical material which can be used to formulate a better, more rational, tariff scheme and subsidy policy.

4.6 Putting in place the long-postponed tariff reforms could be accomplished at short notice. The regulator has enough background analysis and information (from studies sponsored by the Bank) to implement a streamlined and more efficient tariff structure which would put into place the recommendations of Phase II and Phase III reforms indicated above. The Bank's rural electrification project (PERZA) financed two studies regarding tariffs⁶: one of them focused on the question of updating rules, and the other proposed recommendations for restructuring the tariff schedule. The new structure would classify consumers more by voltage levels and demand size, with less emphasis on consumer type, and would include an economic and focused subsidization scheme.

4.7 A number of weaknesses in the legal framework could be addressed in the short term. These include questions such as the conditions of transfer to the distribution company of rural electrification assets. This is a common problem faced by such initiatives, and competent consulting support should be able to provide a number of alternatives based upon real cases in Central America, including some where *Unión Fenosa* is involved (Panama, Guatemala). Choosing a feasible long-term operational, economic, and financial scheme (including the required tariff/subsidy) should be possible. Another question concerns the development of power sector projects, and geothermal ones in particular, in protected areas. Several developers have indicated that the restrictions covering such areas should be reviewed. Finally, a review of the market mechanisms where INE intervened during the last two years (for example, the remuneration rule of generators, which no longer reflects marginal principles) should be undertaken to determine whether they have any merit for the wholesale market to produce the correct price signal.

⁶ PA Consulting and International Consulting Corporation (ICC).

4.8 **Extending electricity service should continue to be a priority.** Despite the success in recent years in improving coverage, although FODIEN was reorganized during the previous administration, it still requires financial and institutional strengthening to accomplish its role.

4.9 **Expanding urban access cannot be neglected.** Despite the higher degree of coverage, urban dwellers without electricity are candidates for swelling the slum population which connects illegally. *Unión Fenosa* should not shrug off this responsibility by claiming it to be the Government's, as in its proposal for dealing with slums. Without rejecting the need for government support, it should be *Unión Fenosa*, as the party with the primary responsibility for providing electricity, that takes the leadership in upgrading substandard facilities. A proactive attitude, and joint public/private participation, should ensure that these potential users receive quality service and enter the mainstream of normal customers.

4.10 **A well-defined power sector policy covering the medium and long term is required to reactivate private sector interest.** It is unrealistic to expect that the sector's problems can be overcome based solely on the investment of public funds. If support from private investors is to materialize, the policy vagaries which plagued the previous administration should be firmly put aside, and the creation of MEM is an opportune moment to do so. The policy should be supported by an assessment of the existing institutional framework, the role of the public and the private sectors, legal safeguards, and the requirements for reform taking into account both the Nicaraguan experience and that of other countries with similar problems, such as (a) pass-through of generation costs; (b) long-term contract conditions for the distribution companies; (c) admissible losses for regulation and tariff-setting purposes; and (d) the discount rate for tariff calculations, among others.

4.11 **In the medium term, the inventory of hydroelectric and geothermal projects should be updated.** This requires investing in feasibility, and possibly design, studies. Many of the projects in the portfolio were studied many years ago and an update with the latest conditions regarding hydrology and geology should be undertaken. Those which can be considered components of a least-cost plan expansion should be taken to the design stage. Who pays for the studies, who owns the rights, and how the plants could be auctioned to the private sector are questions which need to be addressed. This may require a revision of the market design.

4.12 **The power sector policy should be complemented with a long-term plan.** A strategic development plan should be developed within the next 12 to 18 months which can indicate the principal guidelines to be followed by the power sector, including essentially the issues outlined earlier: new generation (thermal, hydro), types of fuels (including natural gas, either compressed or liquefied), the role of imports from the region, and improved rural electrification initiatives. The policy should set out clear-cut guidelines for addressing a change in Nicaragua's energy matrix, with longer-term development of resources indicated above, to counterbalance the short-term, stop-gap measures such as the Venezuelan-backed diesel generators being put in place.

4.13 Participation in discussions and initiatives regarding the regional market and the SIEPAC Central American interconnection project should be a priority. As noted, Nicaragua is a potential major beneficiary of the regional interconnection and could profit from a more proactive participation in the areas having to do with common resource development (including the promotion of larger projects within Nicaragua), and improvements in the energy matrix from the introduction of natural gas in the long term.

4.14 Reinforcing the transmission system to take advantage of the SIEPAC line is another priority that should be addressed within the next 24 months. It is not enough to have the interconnection line reach Nicaragua: the local transmission lines and substations should also be upgraded to be able to either import—or eventually export—energy from/to the regional market.

ANNEX

THE OIL SUBSECTOR

1. OVERVIEW

1.1 In contrast to the situation of electricity supply, the oil industry in Nicaragua poses few decision problems. The country has never produced crude oil and depends on imports to supply its needs. Nicaragua's major asset in this sense is arguably its location at the crossroads of trading routes, which enable it to be supplied from the Gulf of Mexico and the Caribbean refineries, or from the Pacific.

1.2 **Refining and distribution are in private hands.** The country's only refinery is operated by ESSO and is located near Managua; it has a small production capacity of only 20,000 bbl/day. The balance of demand is imported and distributed by ESSO, Texaco, Shell, and Petronic. Petronic is a state-owned company which is currently leased to Glencore, a U.S. corporation.

1.3 **Competition is encouraged.** Oil and oil product prices are free. In 1992 the exclusivity of the State to import oil and oil products was removed. The Import Parity Price methodology (that is, a reference market-based cost of landed imported oil products) was established, which has essentially fiscal consequences. The *Instituto Nicaragüense de Energía* (INE) regulates the market but its role is limited to establishing import and marketing rules, and granting licenses to undertake activities in the sector. The only exception lies in liquefied petroleum gas (LPG) prices, which are set by INE; the posted price for Managua in March, 2007 was around US\$42 per 100lb cylinder. The price control measure is reasonable because of market structure, because only two companies import LPG (Tropigas and Zgas). Otherwise, competition in transport fuels appears to operate efficiently to control prices; for example, the highest posted price of regular gasoline was US\$0.88/ℓ (US\$3.34/gal) in March 2007 and the lowest was US\$0.81/ℓ (US\$3.03/gal).

1.4 **Crude oil and oil products are Nicaragua's largest import.** As such, it is its most pressing economic problem. The estimated current account balance for 2006 yields a negative figure of around US\$890 million, of which 74 percent (\$658 million) corresponds to imports of oil and oil products (total imports amount to around US\$3.2 billion). Alternatives to reduce the oil bill could yield substantial benefits, either by improving efficiency or by substituting oil and oil products.

2. THE OIL MARKET

2.1 The Nicaraguan market is estimated at 10 million barrels per year, and it is not expected to grow significantly in the next four or five years. Nicaragua is the smallest market of the region (ECLAC forecast a demand of 128 million barrels in 2012). Table A.1 summarizes the composition of demand by product, which has not changed significantly since 2005 (although the Ministry of Energy and Mines estimates a 9 percent increase by volume in 2006).

Table A.1. Market by Product, 2005		
	Barrels	Percent
LPG	657,404	6.88%
Regular Gasoline	487,934	5.11%
Premium Gasoline	1,093,734	11.45%
Kerosene/Turbo	213,318	2.23%
Diesel	2,971,679	31.10%
Fuel Oil	3,302,685	34.56%
Coke	623,704	6.53%
Asphalt	186,013	1.95%
Solvents	15,941	0.17%
Avgas	2,865	0.03%
Total	9,557,282	100.00%

Source: INE, January 2007.

In accordance with the table, transport accounts for around 40 percent of the market, followed by the power subsector (33 percent) and domestic uses.

2.2 Imports. The total invoice for oil imports in 2005 was US\$540.9 million and the best estimate made in January 2007 by the Ministry for 2006 was US\$658.3 million. That is a 21.7 percent increase from 2005. (Currently, the reference prices for oil are those from the Mexican Gulf.) Nicaragua's inflation rate in 2006 was 9.6 percent, but prices of fuel increased 21.7 percent. Today, 65 percent of the oil processed in Nicaragua comes from Venezuela through Puerto Sandino in the Pacific coast, 15 percent from Ecuador, 8 percent from Mexico, and the rest from other countries. In the case of Venezuela, 65 percent of the imports are crude oil and the rest are refined products. Main importers are ESSO and Texaco. In the case of fuel oil and asphalt, the numbers include direct imports from self-consumers.

2.3 Options for reducing the oil bill include biofuels and crude production. Given the oil prices, there is the possibility of implementing measures to manage oil demand in the transport sector by adding biofuels, such as ethanol produced from sugarcane, to gasoline. Nicaragua is also in the process of assigning various areas for hydrocarbon exploration through competitive bidding rounds. The Government has identified three areas with medium to high potential to be assigned to private companies. Results are not expected for three or four years.

3. SPECIAL SUPPLY CONDITIONS

3.1 The San José pact has been in place since 1980. The San José Pact, or Agreement of Energy Cooperation with the Countries of Central America and the Caribbean, has been in effect since 1980, and Mexico and Venezuela have renewed it every year in early August. Under the terms of the agreement, Mexico and Venezuela sell 160,000 barrels a day, divided in equal parts, to Barbados, Belize, Costa Rica, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Nicaragua, Panama, and the Dominican Republic. The 11 countries enjoy preferential payment facilities, and the possibility of recuperating up to 20 percent of what they spend on oil through the Pact in the form of long-term loans for development projects. According to the United Nations Economic Commission for Latin America and the Caribbean (ECLAC), the San José Pact must

adapt to the new conditions prevailing in the world today. Since 1995, ECLAC has suggested that the statutes of the Pact be changed to include Colombia among the oil suppliers, guarantee better development of the energy sectors of beneficiary nations, reduce default penalties, and ease the obligation to buy products from Mexico and Venezuela.

3.2 The Venezuela Agreement is the latest aid initiative for coping with the surge in oil prices. The increase in the global price of oil has crippled the economies of many small, poor nations, and the tourism-dependent Caribbean countries are among the most vulnerable. Into this picture emerged Venezuelan president Hugo Chávez and his principled PetroCaribe Plan.⁷ The Plan, which was signed with 15 countries in September 2005, promises deferred payment of oil bills at concessional rates, and wide-reaching social components.

3.3 PetroCaribe does not offer cheap oil, because Venezuela's OPEC obligations prohibit sales at below-market value. Instead, its innovative approach allows area countries to defer part of the payment. The deal functions by means of a discount whereby contracting countries are required to pay a percentage of the market price, with the remaining cost converted into long-term, low-interest loans. When market prices rise above US\$50 per gallon, as they are now, participating countries will receive a 40 percent credit that will accrue as a 25-year, 1 percent interest loan. If prices rise above US\$100, the amount financed by PetroCaribe will rise to 50 percent.

3.4 Under the agreement, Venezuela will cover shipping costs, aid in the development of distribution infrastructure and storage sites, contribute to the formation of state-controlled facilities, and provide fuel-efficient systems in member countries. The one catch is that PetroCaribe will only deal with a state-controlled entity, meaning that the PetroCaribe agreement is based on eliminating all intermediaries; this would require that the receiving state have at least their own terminal and storage facilities. As Nicaragua leased its existing state-owned oil-storage facilities to a foreign company until 2009, this significantly hampers its ability to make the Petrocaribe agreement operational immediately. This also means that existing U.S. area distributors, ExxonMobil, Shell, and Texaco, would be excluded from purchasing Venezuelan oil under the envisioned program. In effect, participating CARICOM countries will be edged in the direction of de-privatizing their oil industry infrastructure in favor of setting up state-guided facilities. PDV Caribe, a subsidiary company of *Petróleos de Venezuela* (PdVSA), will manage the distribution. This company will handle shipment and delivery of the crude, although questions regarding the establishment of regional refining capacity remain.

3.5 PetroCaribe is not without flaws and logistical hang-ups, yet it remains the most concrete proposal on the table to alleviate some of the region's oil-related problems. The new Nicaraguan government administration that was inaugurated January 10th concluded, in the first two weeks on duty, a deal with Venezuela to deliver 60MW of diesel plants to the association of municipalities (AMUNIC) through ALBANIC, a company created by AMUNIC (30 percent) in association with PdVSA (70 percent), the Venezuelan oil

⁷ The Plan is part of the *Alternativa Bolivariana para las Américas* (ALBA).

company. The plant will be fueled by deliveries of diesel to ALBANIC. Delivery conditions are expected to be on soft terms, close to the PetroCaribe pact, with 40 percent of the cost financed over 25 years at 2 percent and two years' grace. The power plants are expensive distillate-fueled units, which should normally be used at peak or during emergencies.

3.6 At the same time, Nicaragua signed an agreement to buy up to 10,000 barrels per day of crude oil or oil products within the PetroCaribe agreement. The conditions of the agreement are market prices and OPEC-specific conditions of delivery. The payment of the crude should be made within 90 days from shipments. The financing offered has two years' grace, for oil prices under US\$40 per barrel. In the case that the market price is over US\$40 per barrel, the payment period will be extended to 23 years, for a total of 25 years, and a reduced interest rate of 1 percent. Nicaragua assumes the refining costs. One of the proposals is to reference the price of the crude and the oil products to the Venezuelan prices and not to the Gulf of Mexico.

3.7 The complete deal with Venezuela has a commitment to build a refinery in Nicaragua to process between 130,000 and 150,000 barrels per day, as an answer to the Mesoamerican Initiative⁸ that wants to build a refinery for 230,000 barrels of Mexican crude per day in Puerto Quetzal, Guatemala, or Puerto Armuelles, Panama. PdVSA also plans to build a pipeline through Nicaragua to transport oil from the Caribbean to the Pacific, bypassing the Panama Canal. ALBANIC confirmed PdVSA's plans for an oil pipeline and mentioned its additional interest in building a refinery in Nicaragua to supply Central America with products. According to ALBANIC, the pipeline would be used to boost exports of oil products made in Nicaragua from Venezuelan crude to China and Japan and the Pacific Coast of Central America.

3.8 **Venezuela is not the only opportunity to take advantage of Nicaragua's strategic location.** Many investors are looking for alternate paths and technologies to transport crude oil and oil products from the Atlantic to the Pacific, trying to reach China and other far-eastern countries with high demand potential. Nicaragua could undertake a thorough study to identify potential investors in one of these projects and take advantage of the deal to transport oil and oil products through the country to guarantee a long-term and secure supply without having to build a refinery.

4. SUBSIDIES AND TAXES

4.1 **Subsidies.** There are no explicit subsidies or cross-subsidies in the price structure of crude oil and oil products. There is only one exception to this and it is the discount that the oil distribution companies give to the consumers of diesel for public transportation. The discount amounts to US3.5¢ to US4.4¢ per gallon, which is financed by the distributors (it does not cost the State anything); the regulator considers that given the margin of the distributor of US10¢ per gallon, this is a fair and socially well-received scheme. There is no control mechanism to guarantee that the discount goes only to public service vehicles. Assuming that public transportation consumes 60 percent of total

⁸ *Plan Puebla, Programa de Integración Energética Mesoamericana (PIEM)*, led by Mexico and signed in 2005.

diesel fuel, this would amount to around US\$3 million per year. It also produces a perverse incentive to “dieselize” the fleet to take advantage of the discount.

4.2 **Taxes on oil products are the lowest in Central America.** Table A.2 shows taxes for premium gasoline, regular gasoline, and diesel in the six Central American countries.

Table A.2. Average Taxes on Transport Fuels in Central America (US\$ per gallon)						
	Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua	Panama
Premium Gasoline	1.03	0.71	0.93	1.16	0.70	0.60
Regular Gasoline	0.98	0.70	0.91	1.15	0.70	0.60
Diesel	0.57	0.50	0.40	0.61	0.54	0.25

Source: INE.

As a source of fiscal revenue, taxes on gasoline could be increased profitably to levels similar to those in neighboring countries, such as Costa Rica.

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