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April 1, 1996

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United States Agency for International Development
United States State Department Building
320 21st Street, N.W.
Washington, D.C. 20523

Subject: Romania: Study of Options for the Long Term Structure of the
Power Sector: Phase I Options Report, Executive Summary -
Final Version

Dear Ms. De Rosa:

We are pleased to submit herewith the final version of the Executive Summary for the main Phase I Options Report for the subject study, prepared under Bechtel International's contract with USAID. This report is submitted in accordance with the Terms of Reference (TOR) and is the final deliverable for the Phase I of the study.

The main report now incorporates and responds to the comments received from the Steering Committee based on the submission of the original Phase I Report officially transmitted on March 1, 1996, and formally presented to the Steering Committee on March 12, 1996. In general all commentors indicated that we met the requirements of the TOR.

We have elected to address the comments in a separate annex to the main report. This reflects our position that the Phase I report was to be an *independent* assessment by the consultants. Accordingly, rather than modify the original text of the report we felt it more appropriate to show our specific responses to the comments in one place so readers can distinguish between the original report and the comments. The responses to the comments as well as the complete text of all the comments are included in Annex F of the main report. The Executive Summary provides a summary of the principal responses to the comments and is included as an attachment to this letter.



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The majority of the comments centered on possible variants to the options. In considering these possible variants they would, at one extreme, either not meet the GOR objectives nor meet the basic principles of transparency and non-discrimination or, at the other extreme, result in a more rapid disaggregation of the system. Accordingly, this brings us to our original position that the relevant choice is between Option 2 and 3.

Once a decision has been made as to which option is preferred, the GOR will have established the basic structure for meaningful reform. We would then recommend that if further refinements to the selected option are desired, which will meet the GOR objectives, these be undertaken at the commencement of Phase II of this study.

We believe that we have been fully responsive to the comments provided by the counterpart team, and consider Phase I of our work now complete.

We understand the Council for Coordination, Strategy and Economic Reform will move expeditiously to insure a decision is made by the Government with regard to a preferred option within the timeframe established with the World Bank. Again, we wish to express our sincere appreciation to the many officials and staff who provided their insight and advice during the course of Phase I. We look forward to the start of Phase II of this vitally important study.

Sincerely yours,



Wayne G. Mikutowicz
Project Manager

Copies to: Richard J. Hough, USAID Representative to Romania
Sam O'Brien-Kumi, IBRD
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Attachment

SUMMARY OF COMMENTS AND RESPONSES

The Steering Committee provided both verbal and written comments on the report. They agreed that the report met the requirements of the Terms Of Reference. The most important comments focused on:

- Current Policy Environment And Capital Attraction
- Possible Variants On The Options

CURRENT POLICY ENVIRONMENT AND CAPITAL ATTRACTION

The Steering Committee stressed the significance of these issues for the restructuring options. The current policy environment poses barriers to attaining effective competition and attracting private capital to the power sector. Reducing these barriers is a prerequisite to successful implementation of any new structure. Changes would be required in the following areas to permit successful operation of the power sector for any structure:

- Financial blockage - must be eliminated.
- Tariffs - must be high enough to make new investment attractive.
- Legal and regulatory framework - must provide a basis for private participation and sufficient stability to give investors confidence.
- RENEL financial strength - RENEL must be a sound firm and a creditworthy partner for firms that do business with it.

In addition, certain current national policies are inconsistent with some of the structures. In Option 2 the subsidy from industrial to residential customers must be changed. In Option 3 the domestic fuels priority also cannot be sustained. In Option 4 uniform national tariffs can no longer prevail.

Without outside funds the power sector will not be able to generate the investments needed to maintain the supply of electricity, a fundamental and vital part of the Romanian economy. To attract capital to the Romanian power sector will require, in addition to the four factors mentioned above:

- Institutions and practices that provide for fair and nondiscriminatory treatment of all investors.
- Investor control over business decisions that are crucial to their profitability (such as location, fuel cost, to whom they sell, etc.)

None of these six conditions exist in Romania today. The first four factors are common to all structural options. Only the fifth and sixth will have significant differences among structures.

Several steps are necessary to bring substantial amounts of private capital, especially foreign capital, to the power sector. First, establish the necessary preconditions. Eliminate the financial blockage, raise tariffs, establish a

modern legal and regulatory framework that provides for private participation, and put RENEL on a sound financial footing. Second, establish the structural basis for competition. Private investment will increase as the scope for competition broadens, the potential for discrimination decreases, and the control investors have over their business decisions increases. In general the amount of capital attraction increases from Option 1 to Option 4.

VARIANTS ON THE OPTIONS

The Steering Committee asked the consultants to consider the following variants on the Options:

- Option 1, Vertically Integrated Monopoly, with compulsory competition for new capacity
- Option 2, Single Buyer, with RENEL as the single buyer
- Option 3, Open Access, with negotiated third party access
- Option 4, Competitive Market, with no power pool
- Variants on Options 2 and 3 with additional disaggregation

The key points associated with each variant are summarized below.

Vertically Integrated Monopoly (Option 1) With Compulsory Competition

Option 1 leaves it to RENEL whether or not it will seek offers for new generation or build the plants itself, and how to select the winners. The alternative is to have compulsory competition for new or other significant generation by requiring that RENEL seek bids before making substantial investments in generation and select winners openly and fairly. The fundamental drawback of Option 1 and the variants on Options 2 and 3 is that they leave the possibility of competition to the discretion of RENEL. This creates a clear conflict of interest and we would expect that little competition would actually occur. There are two ways to address this issue.

First, require mandatory and fair competition with extreme regulation. However, RENEL will have major advantages over its potential competitors and the regulator. For example, its control over data on generation and loads might permit it to move solicitations to times that favored RENEL. Also, it could allocate costs away from generation, to the monopoly functions, favoring its generation projects. It is very difficult for an outside agency to have enough information to detect and correct such possible abuses.

Second, RENEL might not be permitted to bid itself. Eventually it would be left with its hydro system and the grid. This would have the advantage of addressing self-dealing effectively, but would remove RENEL from the thermal generation business.

Single Buyer (Option 2) Variant With RENEL As The Single Buyer

In Option 2 there is a separate power purchasing agency, entirely independent from RENEL, which is the sole buyer and seller of bulk power. The agency would have no incentive to favor RENEL's generation in its purchasing decisions. The proposed variant is to have the power purchasing function reside within RENEL.

However, by doing this we forego the main benefits of the single buyer model compared to Option 1. RENEL would be in a position and have an incentive to control the competitive process. For example, RENEL could choose to build a new plant itself without getting bids from IPPs, or could evaluate bids in a private process that favored its own offer. The net result would be high barriers to entry and limited competition.

If the power purchasing decisions were left to RENEL's discretion, the practical impact would be to create a disguised version of Option 1, which would have that Option's general characteristics. It would achieve almost none of the GOR's strategic objectives. The fundamental drawback of this variant is that in order to be effective, competition must be mandatory. If it is left to the discretion of one of the participants, it does not occur to a substantial degree.

Making competition compulsory and/or not permitting RENEL to compete would be ways to address concerns about self-dealing, discrimination, and non-transparency, as discussed in the subsection above. However, these issues are more effectively and realistically handled in the originally proposed Option 2.

Open Access (Option 3) Variant With Negotiated Instead Of Open Access

Open Access provides fair and open access to the transmission and distribution grids for large industrial customers, permitting them to buy from IPPs as well as from RENEL. In contrast to Option 2, Open Access puts significant competitive pressure on RENEL's existing generation. RENEL cannot sustain high rates to eligible customers because they have the choice of buying lower cost power from IPPs, which they cannot do in Option 2. The proposed variant is to have negotiated third party access (NTPA). "Negotiated" refers to addressing the economic impact of the transaction on RENEL's generation, especially with regard to stranded investment.

The ability of IPPs and eligible customers to transact with each other that provides the principal competitive benefits of Open Access. If RENEL is unable or unwilling to provide low cost power, eligible customers will buy from IPPs. RENEL is forced to compete or forego selling its generation to large customers. If RENEL has the ability to block transactions between eligible customers and IPPs, the net result could be a closed market and limited competition. Again the practical impact would be to create a disguised version of Option 1, with that Option's general characteristics.

Permitting RENEL to control transactions is at odds with the fundamental purpose of the structure. Limiting stranded investment would be the primary rationale for controlling transactions. However, the people of Romania, through the GOR, own the investments and are also the consumers of the electricity they generate. Any losses due to stranded investment are more than balanced by gains due to new lower cost power. In summary, if the GOR wishes to protect RENEL's existing generation assets from serious competition, it can do so within the structure of Option 2 more easily and directly than by permitting RENEL to control transactions within the structure of Option 3.

Competitive Market (Option 4) Variant Without The Power Pool

One of the key complexities of Option 4 is the daily price-based power pool. Alternatives to that pool arguably provide many of the competitive and other benefits, for example cost-oriented pools with a longer term focus, or no pool (bilateral contracts).

Participation in the power pool is mandatory for all producers and distributors, so there is no halfway measure in establishing it. However, the benefits it provides depend on the number and character of market participants. The benefits of the pool when there are only a few participants are limited. In such circumstances the transactions could be handled successfully through bilateral contracts instead. If Option 4 had evolved from Option 3, there would already be transmission and grid services tariffs in place. At least in its initial phases, it could be preferable to use those in the more disaggregated Option 4 rather than implement a power pool.

As the number of buyers and sellers increases, and smaller organizations participate, the need for the pool increases. The pool provides a simpler backup supply for small transactions than if they were handled with bilateral contracts. As the number of participants increases, the number and complexity of bilateral contracts also increases. Problems of metering, communications, contracts, and so on would multiply. In such a circumstance the power pool might address many of the issues at lower cost. The costs and benefits of different pool alternatives, and those of bilateral contracts, can be evaluated if necessary in Phase II.

Variants Of Options 2 And 3 With Additional Disaggregation

Options 2 and 3 leave RENEL as a vertically integrated utility. Even though the different functions would exist as separate divisions within a holding company, their common ownership would provide an incentive for overall self-dealing by RENEL, which would have to be addressed through regulation and, for Option 2, by establishing the power purchasing agency.

Another way to address the issue of self-dealing is to more completely separate the natural monopoly functions from the potentially competitive functions. In Option 2 the Single Buyer could be part of Transmission /

National Dispatch, and that entity, RENEL Generation, and RENEL Distribution could each become an entirely separate company. In Option 3 those functions also could be placed in independent companies.

The separation removes the incentive for self-dealing more cleanly and directly than trying to handle the issue in part through regulation. The resulting structures are likely to achieve greater benefits of competition, but also require more drastic changes now to the existing structure. They would also set the stage for potential earlier transition to some variant of Option 4.

Evolution Of Options From One To Another

Some comments suggested a transition from Option 2 to Option 3 to Option 4. From the point of view of power sector structure, Options 3 and 4 share more similarities. Some aspects of Option 2 are fundamentally inconsistent with Options 3 and 4. We consider Options 2 and 3 to be mutually exclusive.

The following points are relevant:

- The transition from Option 2 to Option 3 would require eliminating the power purchasing agency, a fundamental rather than evolutionary change.
- Option 3 presents a smoother transition to Option 4.
- Option 2 would require more changes to become Option 4 and would therefore require more time.

Annex F of the main report contains a more detailed discussion of these and other comments.

Romania

Study of Options for the Long-Term Structure of the Power Sector

Phase I Options Report

Executive Summary

Requested By:
Government of Romania

Prepared under Contract for:
**United States Agency for International Development
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I. THE GOVERNMENT OF ROMANIA HAS DECIDED TO EVALUATE RESTRUCTURING THE POWER SECTOR

The Government of Romania (GOR), in conjunction with its transition to a market economy, has decided that fundamental reforms to the power sector, one of the most important sectors of the Romanian economy, is an integral part of this transition. Accordingly, the GOR foresaw the need for this study, which would provide the basis for action for sector transformation to a market environment. The United States Government, as represented by the U.S. Agency for International Development (USAID), at the request of the GOR agreed to provide the financial support for the study. The World Bank and the European Bank for Reconstruction and Development (EBRD) support the GOR in this regard, and therefore the World Bank has made reform of the power sector one of the main objectives of its assistance to the Romanian power sector.

Under USAID's Central and Eastern Europe Regulatory Reform and Energy Sector Restructuring Project with Bechtel International, Inc., a project team comprising specialists from Bechtel, Arthur Andersen, National Economic Research Associates, and Pierce, Atwood, Scribner, Allen, Smith and Lancaster was assembled to execute the study. In addition, local Romanian assistance was provided by the Institute of Power Studies and Design (ISPE), Professor Lucian Mihai, Professor Aureliu Leca, and Western I Q.

The objective of this study is to assist the GOR in selecting the structural option that will come closest to achieving its policy objectives and in defining the legal and regulatory framework most appropriate for implementation of that option.

The study is being conducted in two phases. Phase I, the current phase, is focused on the identification of a set of restructuring options and associated regulatory and legal framework. Phase II will focus on developing a detailed implementation plan for the preferred option selected by the GOR.

This report is the final deliverable under Phase I of the work plan. The report:

- Evaluates Romanian specific factors and their implications for restructuring
- Identifies alternative restructuring options
- Assesses each restructuring option in terms of advantages and disadvantages
- Suggests needed regulatory and legislative changes
- Recommends a course of action

In developing the underlying analyses of the options presented herein, the project team relied upon information and data made available to us by RENEL and the

various ministries. Accordingly, the results and conclusions presented in this report reflect this information and the best professional judgment of the project team. The project team wishes to express its sincere gratitude to the numerous Government and company officials and staff whose cooperation, candor and assistance made this report possible.

This report focuses on the restructuring of the power sector. Sector restructuring differs from corporate reform in that an entire industry is assessed with regard to the interrelationships among its various institutions and entities. The goal of sector restructuring is to enhance the commercial and market orientation of these institutions and entities, thereby promoting competition, which in turn improves industry performance and increases the efficient use of resources. Corporate reform, on the other hand, focuses on the transformation and organization of a single company. As such, it is only a part of sectoral restructuring.

It is also important to note that this study is concerned with *long-term* structural change, based on the recognition that time will be required to implement fundamental changes in an industry and market structure and associated institutional reform. The length of time required cannot be stated with precision because it is related to the nature and complexity of the suggested changes.

II. IN ORDER TO ACHIEVE GOR STRATEGIC OBJECTIVES, SECTOR RESTRUCTURING IS REQUIRED

The power sector in Romania has been characterized until recently by power supply deficits and load shedding. This situation has improved due a combination of declining demand and increased availability of the units. Notwithstanding these developments, the system still has poor unit availability and sustains significant system losses as a result of obsolete and difficult-to-maintain equipment. The sector also faces significant resource constraints compounded by a financial blockage. Because of the significance of the sector, these problems are amplified throughout the economy.

The government exerts considerable direct control over the development and management of the sector and indirect control through its domestic fuels and district heating policies. Practices involving cross-subsidies and uniform tariffs further complicate efforts to improve the system. In summary, fundamental problems in the power sector inhibit its ability to perform in the most economic manner, which in turn impacts the overall economic development of Romania and affects its candidacy for membership in the European Union (EU).

The GOR recognized these problems and has created a long-term vision for the sector, as embodied in its May 1995 sector strategy and further elaborated in its agreement with the World Bank. The overall objectives of the GOR's plan to restructure the sector are *to improve the efficiency and reliability of the sector and to meet*

the demand for electricity in the most economic manner, while minimizing negative environmental impacts. The GOR will achieve these objective by:

- Implementation of a gradual and fundamental reform of the sector organizations and its legal and regulatory framework to create the conditions for effective competition and the participation of independent operators - mainly in energy production.
- Adaption of the sector institutions to a market-oriented economy
- Adoption of least-cost investment programs
- Implementation of sector pricing policies that will assure sector viability and provide incentives for private-sector participation.
- Participation in the regional electricity market through membership in the Union for the Coordination of Production and Transmission of Electricity (UCPTE)
- Implementation of measures to stimulate efficient use of electricity and integrated resource planning, based on systemwide optimization, as well as measures to improve the autonomy and financial viability of the sector entities
- Implementation of measures to meet Romania's obligations under the Energy Charter Treaty
- Commitment to full membership in the EU

The current industry structure will not achieve this ambitious and forward looking vision of the sector. Change is required. Accordingly, the selection of any restructuring option must be gauged against these objectives as one measure of their viability.

III. FOUR RESTRUCTURING OPTIONS WERE IDENTIFIED

What type of restructured power sector is most appropriate for Romania? The final answer to this question rests with the GOR; however, this report should provide the groundwork upon which that decision can be made. The need to improve efficiency in the power sector and meet demand in the most economic manner can be achieved through the introduction of appropriate profit incentives and competition. Under the current structure, these do not exist for the following reasons:

- The GOR still controls the sector. There is no profit incentive, and mixed objectives still guide the utility.
- In the absence of competition, there is little incentive to improve efficiency.
- Without transparent, objective regulation, there can be little certainty regarding return on investment or other basic requirements of business.

- Imposing GOR policies through cross-subsidies, price setting, and rationing creates distortions that complicate rational economic decision making and the introduction of competition.
- All of the above make attracting private capital difficult.

Therefore, fundamental changes are required to promote a competitive environment in the generation of electricity and to provide large consumers with the ability to choose their suppliers. In the short run, this will provide the stimulus to reduce costs and improve operations. In the long run, these efficiencies will result in the least-cost investment in generation and other facilities. These benefits can be achieved in varying degrees, depending on the degree of restructuring.

In recognition of the above issues and the GOR objectives, as well as the prevailing conditions in Romania, four options have been defined, which we believe provide the fullest range of restructuring possibilities for Romania. The four options are presented in terms of increasing market complexity.

- *Option 1: Vertically Integrated Model.* This is the traditional electric utility model characterized by integration into one company of the functions of generation, transmission, and distribution (including sales of electricity, also called supply or commercialization). The vertically integrated utility enjoys monopoly status.
- *Option 2: Single Buyer Model.* This is a variation of the vertically integrated utility with competition introduced at the generation level. Under the single buyer model, independent power producers build and operate generation plants on the basis of power purchase agreements with a power purchasing agency which would be completely separate from the utility and which would be the sole buyer and seller of power.
- *Option 3: Open Transmission Access Model.* Under this model there is functional disaggregation (but not necessarily legal separation) of the vertically integrated utility into generation, transmission and distribution, and opening up of the transmission grid, thereby allowing certain customers to contract with any supplier. The distribution company would continue to operate as monopoly with the obligation to deliver to captive customers.
- *Option 4: Competitive Model.* This model would disaggregate the utility into separate companies providing generation, transmission, and distribution. There is competition in both the production and purchasing of electricity.

Figure 1 shows the range of competition anticipated among the principal sector functions for each option.

| Function \ Option | I Vertically Integrated | II Single Buyer | III Open Access | IV Competitive |
|-------------------|-------------------------------|-----------------------|-----------------------|-------------------|
| Generation | ● | ◐ | ○ | ○ |
| Transmission | ● | ● | ● | ● |
| Distribution | ● | ● | ● | ● |
| Supply* | ● | ● | ◐ | ◐ |

● No competition; retains monopoly status

◐ Limited competition

○ Full competition

*Supply includes marketing of electricity and customer interface.

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Figure 1 Scope of Competition for Each Restructuring Option

IV. OPTION 1 MAINTAINS THE STATUS QUO WITH MINOR IMPROVEMENTS

In Option 1, we assume that RENEL will allow Independent Power Producers (IPPs) and it will proceed with balance of its corporate restructuring plan. It will remain a state-owned, vertically integrated monopoly. Under this option RENEL decides whether to build or buy from IPPs. *Thus competition in generation is permitted but not required. There is no competition in supply: customers can buy only from RENEL.* The principal features of this option are as follows:

- RENEL remains a vertically integrated, state-owned company and continues to supply electricity and heat, with the exception that heat-only units are divested.
- It continues to own its existing assets.
- Its principal functions (generation, transmission and distribution) are set up as separate cost centers.

- Regulation is achieved primarily through a management contract with the MOI.
- Cernavoda and all nuclear power activities are split off to become a separate independent public entity within 18 months of initial commercial operation.
- IPPs are permitted to supply new capacity at RENEL's discretion.
- RENEL retains its position as the sole buyer and seller of electricity.
- Current GOR policies are maintained with respect to fuels, labor, and subsidies.

Experience in Other Countries

Option 1 conforms mostly closely to the power sector in France. The power sector is dominated by Electricite de France (EdF) which provides over 90 percent of the country's electricity to 27 million customers. The utility is government-owned.

EdF is vertically integrated, and operates under a performance contract or "Contrat de Plan," with the Government of France, the Ministry of Industry. Beginning in 1989, it was decided that EdF's policies, including its financial objectives, would be determined by multi-year contracts approved by the Government. This framework for regulation of EdF is the Contrat de Plan (the current contract expires in 1996). The purpose of this contract is to provide the regulatory mechanism and give the utility autonomous management control while remaining a government-owned utility. The rates are calculated by EdF and submitted to the Government for approval under the stipulations in the Contrat de Plan.

The performance of the French model must be viewed favorably because it is relatively well managed. For example, its ratio of customers per employees is 230 vs. 80 for Romania. EdF plans investment on a least-cost basis and prices electricity based on marginal cost methods in contrast to the Romanian power sector. Electricity costs are approximately 7 cents per kWh and have declined over time. EdF has been able to secure financing from international capital markets without government support.

The key elements which make the EdF model work well in France (effective government, transparency, and rational cost-based decision making) are still under development in Romania. Given these considerations, the magnitude of changes which would be required to replicate the EdF system in Romania would most likely require the same level of effort and institutional changes as those required under the other options.

Advantages and Disadvantages

The principal advantages and disadvantages associated with Option 1 are set out below:

- **Advantages**
 - 1) Relatively less disruptive and more easily implemented than the other options
 - 2) Lower transition costs compared to the other options
 - 3) May encourage limited new investment in IPPs
 - 4) May provide a more commercial orientation
- **Disadvantages**
 - 1) Not likely to meet EU requirements
 - 2) Does not provide full benefits of competition and may not provide any
 - 3) RENEL can limit IPP participation and may engage in discriminatory behavior
 - 4) Susceptible to ineffective regulation
 - 5) Performance contracts may not be effective
 - 6) RENEL can still be used as an instrument of public policy
 - 7) Investors likely to perceive higher risks than Options 2 to 4

Option 1 presents a structure that is basically an extension of what currently exists. It fits within the current economic and institutional environment. Limited competition is allowed in generation; however, regulation would be required. The GOR would still exert direct control over RENEL although this would be reduced to negotiating the management contract and approving the investment program, which may require GOR guarantees. The MOF would still be involved in the setting of tariffs.

In our opinion, the advantages do not present a compelling case for this option. Our reasoning is based on consideration of the following:

- 1) **Competition in generation:** Over 70 percent of RENEL's costs are associated with the generation function. Accordingly, this function provides the greatest opportunity for improved efficiency and, consequently, lower costs. One proven way to achieve this is by introducing competition. However given that RENEL retains significant market power, this is not a certainty in this option.
- 2) **Viability of management contracts:** This is the principal mechanism for promoting commercial behavior. However, in the current institutional environment, we believe that it would be difficult to put in place effective contracts that are enforceable. Moreover, RENEL knows its costs and operations better than anyone in government, and therefore can get the best terms and set performance targets that may limit gains in profitability and productivity.

- 3) **Maintenance of GOR policies:** The benefits of competition and market-based decision making are reduced due the continuation of the GOR policies. For example, cross-subsidies that create economic distortions and inefficiencies may make it more difficult to attract IPPs if they limit payments without economic justification. It is questionable whether this degree of government control fosters decisions that are in the long-run economic interest of Romania.
- 4) **Conformance with EU requirements:** The potential for discriminatory behavior, lack of transparency, and questionable access to the power system network make conformance with EU requirements less likely.

For Option 1 to be viable, the following actions would have to be undertaken, although they would only serve to improve a structure that still cannot achieve Romania's long-run objectives. These actions would include establishing a viable framework for IPP participation, which would include stating pricing principles, forming the basis for contracts, and providing investors with assurances that the rules won't change unexpectedly. There would also be the need to address the question of self-dealing and how to regulate such behavior. Related to this is the need for better understanding of costs and a more transparent approach to setting prices.

V. OPTION 2 CREATES A NEW ENTITY TO BUY AND SELL POWER

Option 2, designated the *Single Buyer Model*, was designed with two related objectives: first, to provide increased competition compared to Option 1; and second, to incorporate features more likely to be aligned with EU directives on the structure of the power sector. Although Option 2 retains generation, transmission and distribution/supply in a vertically integrated structure, there are nevertheless significant differences compared to the vertically integrated model presented in Option 1. *In contrast to Option 1, all new generation will be subject to competitive procurement. As a consequence, generation acquired on a competitive basis will eventually dominate the market.*

The key features of Option 2 are as follows:

- A new entity is created – a power purchasing agency – with responsibility for buying all power from generators and selling of bulk power in Romania. The agency would be government-owned and would be a not-for-profit entity.
- IPPs would be permitted and encouraged to bid for new generation through the power purchasing agency.
- Large industrial users (over 100 GWh/yr) would be allowed to buy directly from the power purchasing agency in accordance with EU directives.
- RENEL distribution would also be required to purchase power from the agency and would supply power to all remaining (captive) customers.

- There would be no third party access.
- RENEL would be organized as a holding company with separate divisions for generation, transmission/dispatch, and distribution. There would be separate accounting and an explicit methodology for setting transfer prices among divisions.
- Eventually, RENEL would be corporatized as a joint stock company with each division becoming a subsidiary.

Increased competition is introduced into the generation of electricity by requiring the power purchasing agency to acquire all new power supplies through a competitive bidding process. As pointed out in Option 1, with 70 percent of RENEL's costs associated with its generation division, it is this component of the power sector that provides the greatest scope for competition. Competition would be introduced gradually over time. Each plant in the system would have a separate contract with the power purchasing agency, based on the remaining economic life of the plant. Such contracts would take into account, among other factors, the plant's expected costs. At the end of the contract, the capacity would be subject to competitive bid by new sector entrants as well as RENEL.

Experience in Other Countries

Experience with this model as developed here is limited. Only one country to date, Ireland, has decided to implement such a structure over the next 2 years. However, some parallels can be seen from the experience in Malaysia, where the structure is similar but not exactly the same as Option 2, the principal difference being the single buyer is the vertically integrated utility Tenaga. The utility is structured as a holding company and has been partially privatized. In Malaysia, IPPs are allowed to participate in conjunction with local partners under build, own, operate, and transfer (BOOT), and build, own, and operate (BOO) licenses. However, Tenaga is the sole buyer. The roles and responsibilities of the regulator, relevant Ministries, and the utilities and the licensees are clearly defined in the Electricity Supply Act. The results of the Malaysian experience have been encouraging, with IPP projects totaling some 4,000 MW. However, the principal disadvantage of the Malaysia situation is the potential for discriminatory behavior, as Tenaga is sole buyer, generator, and also a partner in some of the IPP projects.

Advantages and Disadvantages

The principal advantages and disadvantages associated with Option 2 are set out below:

- Advantages
 - 1) Provides greater scope for competition in generation than Option 1

- 2) Significantly reduces the GOR involvement in investment and management of the sector
 - 3) More cost and price transparency
 - 4) Provides more incentives for RENEL to improve its operations
 - 5) Provides greater empowerment of management and employees
 - 6) Better potential to attract capital than Option 1
 - 7) Better fit with EU requirements
 - 8) Facilitates selective privatization
 - 9) Creates incentives to rebalance tariffs between residential and industrial
- Disadvantages
 - 1) Potential remains to maintain economic distortions associated with GOR fuel and possible pricing policies
 - 2) Government guarantees may be required to attract IPPs
 - 3) Government ownership of the power purchasing agency may expose it to significant financial risk
 - 4) Complex contractual relationships may involve high transaction costs

The principal advantage underling the selection of this option is the increased scope of competition in generation as compared to Option 1. *Significantly, it also would meet the government's strategic objectives for the sector without radical change. It would more closely fit with evolving EU requirements for the electricity market by providing more transparency and more competition.*

The option has other features which are highly desirable. It should provide a better basis upon which to attract foreign investment. Since the conditions for entry will be consistent for all, there will be more transparency as to the formulation of costs and tariffs, and there will be clarity of regulation. The option provides, through the contracting mechanism and the opportunity to bid for new generation, incentives for RENEL to improve its commercial orientation. Lastly, it provides complete management autonomy and less interference from the government.

The principal disadvantage is the creation of the government-owned purchasing agency and the contracting mechanisms associated with it. This will be a substantial undertaking requiring setting up and staffing the entity, developing the contracting mechanisms, and negotiating billions of dollars in contracts. The transition cost to this option will be significant, including the potential credit risk accepted by the government as owner of the entity. However, under any of the options, new contracting mechanisms will be required, and GOR guarantees will be required at least initially for new IPPs. *Accordingly, the key issue is the suitability of the power*

purchasing agency, in Romania, as a vehicle for promoting competition, commercial transparency, and non-discriminatory behavior.

VI. OPTION 3 PROVIDES OPEN ACCESS TO THE TRANSMISSION NETWORK

Option 3, designated the Open Access Model, further opens up the power sector to market forces, but retains the characteristics of a vertically integrated monopoly. *The key feature of this option is the introduction of open access with common carriage. A common carrier is an entity required to transmit electricity for buyers and sellers on a nondiscriminatory basis and, if necessary, to construct additional transmission capacity if the existing capacity is not adequate to meet all needs.* Competition in Option 3 results from fair and open access to the transmission and distribution grids for large industrial customers. Fair and open access would have to be mandated by the GOR in the electricity law, as monopoly control over the transmission access is generally considered to be the greatest single impediment to competition in the supply of electric power.

The key features of Option 3 are as follows:

- The transmission and distribution divisions of RENEL are required to transmit (or "wheel") power for all eligible customers at nondiscriminatory rates and conditions.
- Large industrial customers can negotiate and buy directly from those generators (IPPs or RENEL) who offer the lowest cost service.
- RENEL Distribution provides power at regulated, cost-based tariff rates for small (captive) customers and those large customers who choose to purchase electricity from it, while, at the same time, large customers purchase power under market-based contracts and prices (for generation only).
- Generation would be provided from four sources: RENEL's Generation subsidiary; a separate government entity that owns and operates Cernavoda; IPPs; and imports. The IPPs would operate under a licensing regime.
- RENEL would be organized as holding company and would become a joint stock company. Generation, transmission/dispatch, and distribution would become subsidiaries.

To encourage development of an independent power business and to safeguard against the exercise of market power in generation by RENEL, RENEL distribution would be required to acquire 100 percent of any new generating capacity from IPPs until such time when at least 15 percent of systemwide generating capacity is supplied by licensed independent providers. RENEL plants which had reached the end of their initial economic lifetime contracts would be permitted to compete in

tenders before the 15 percent requirement was met. After the 15 percent threshold was attained, there would be fully competitive bidding for capacity.

Experience in Other Countries

Relevant experience in establishing open access networks is somewhat limited. *Portugal*, in 1994, decided to restructure its power sector in order to meet EU proposed directives for market liberalization, as well as to improve operational efficiencies, and to rationalize the sector's structure. *Electricidade de Portugal* (EDP), originally a state owned monopoly, was restructured into eleven companies.

The market is structured in two segments: the public electricity service and the independent electricity market. The independent market allows direct contracting between large customers and generators and third party access to the transmission grid. The public segment is closely regulated with respect to price setting and the construction of new capacity.

The open access model in Portugal has not yet reached the implementation phase; therefore, it is premature to comment on impacts as a result of the change. However, it is worth noting that this model is considered to be responsive to the EU directives calling for third party access and liberalization of prices.

In the *United States*, open access has been mandated at the national level under the Energy Act of 1992. This covers purchases and sales among individual utilities, and also purchases from IPPs. Some utilities have already filed open access tariffs. That process has demonstrated the following factors, among others:

- Open access, at least at the wholesale level, can be implemented in a reasonable period of time.
- The willingness of the regulator to make difficult decisions is critical to make the process go forward.

There are many technical complexities in establishing tariffs and rules.

Advantages and Disadvantages

The principal advantages and disadvantages associated with Option 3 are set out below:

- Advantages
 - 1) Provides for more supply competition than Options 1 or 2
 - 2) Provides for greater retail competition than Option 2
 - 3) Would better meet EU requirements
 - 4) Has more management autonomy at subsidiary level

- 5) Meets most of the GOR's strategic objectives for this sector
- 6) Is more attractive to private investors
- Disadvantages
 - 1) Has potential for self-dealing by RENEL
 - 2) Could result in loss of distributors' best customers - "cherry picking"
 - 3) Has greater potential for stranded investment
 - 4) Requires more complex procedures than Option 1 or 2
 - 5) Creating open access transmission tariffs involves complex issues and trade-offs

The chief advantages of the open access option are that it provides for full competition for power producers and partial competition for power consumers. *Option 3 would more completely meet GOR's objectives for the sector because there will be more dynamic competition among sellers and buyers, and hence greater opportunities for cost reduction and higher levels of IPP investment.* Because of competition for consumers, it will put much more pressure on RENEL than Option 2 to reduce costs, rationalize its operation, become more efficient and customer-oriented, and improve its decision making. As a result of the opening up of the network and more liberal market conditions, it is more likely to comply with EU directives regarding competition in the power sector.

There will be challenges to implementing Option 3. These will include resolution of possible policy conflicts regarding fuel use and cross-subsidies, regulatory scrutiny of RENEL to prevent discriminatory behavior in the early stages of implementation, and development of appropriate tariffs and technical infrastructure to provide efficient and fair access to the network.

VII. OPTION 4 DISAGGREGATES THE SECTOR INTO NEW ENTITIES

Option 4, designated the Competitive Market Model, separates the assets of the utility (generation, transmission, and distribution) with each service provided by a new entity. The basic components of the delivered product (generation, transmission, and distribution) are priced separately by each of the providers. *The option introduces competition not only in the generation of electricity, but also in the sale and distribution of electricity to end-use customers. Option 4 would meet all requirements of the EU directives for liberalizing the energy market.*

The key features of Option 4 are as follows:

- RENEL would cease to exist as presently structured. Its assets would be divested into a number of independent companies, including the potential for several generating companies and distribution companies.

- The transmission company and the distributors would retain monopoly characteristics and require regulatory oversight.
- Large industrial customer can choose to buy from either IPPs or the distributor
- A competitive power pool based on hourly bids will link all buyers and sellers of electricity. Long-term supplies of electricity to customers are based on long-term contracts, but the ongoing operation of the system would be managed by the pool.
- Fair and open access to the transmission and distribution grids would be mandated.

Experience in Other Countries

The Competitive Market Model has been implemented in a number of countries. The *England/Wales* model is the most noteworthy and is the same as the option presented here. The restructuring required significant time. Privatization took place 3 years after the government made its decision; however, a transition period of 8 years was provided for. Moreover, there had been prior experience privatizing British gas. The restructuring and privatization resulted in significant reductions in operating costs of the newly created entities, significant entry of IPPs, and reductions in electricity prices. The principal concerns relate to retention of market power by the generating companies which were initially created, and the tendency for reintegration of some segments of the sector. Accordingly, a greater role is being played by the agency which oversees competitive performance.

Peru provides another example of this model but in modified form. *Peru's* restructuring produced a disaggregated structure, including competition in generation, but no power pool. Although the experience record is not as lengthy as that in *England/Wales*, some observations are possible.

- It is workable in a country with a smaller economic base and on a system that is mostly hydro. The pricing regime has created incentives to control costs and invest in new equipment.
- The resulting structure has proved attractive to investors. Private investment, much of it foreign, approaching \$1 billion has been realized already.

Advantages and Disadvantages

- Advantages
 - 1) Provides fullest scope for competitive benefit
 - 2) Achieves GOR strategic objectives
 - 3) Will meet all EU directives

- 4) Greatest potential for capital attraction and privatization
- 5) Complete management autonomy
- Disadvantages
 - 1) Not viable under existing GOR policies
 - 2) Highest transition costs
 - 3) Requires complex commercial and institutional arrangements
 - 4) Additional legal and regulatory requirements

The chief advantages of the Competitive Market option are that it provides for full competition for power producers, increased competition for power consumers, a disaggregated structure, a competitive power pool based on hourly bids which link all buyers and sellers of electricity, and greater potential for privatization. The GOR strategic objectives for the sector will be achieved. *Because of additional competition for consumers, there will be more pressure for efficient operation and sound decision making. As a result of the broader competition, it is most likely of all the options to comply with EU directives regarding competition in the power sector.*

Of all the structures, Option 4 requires the most significant change to the institutional and administrative infrastructure. It also requires changing another of the GOR's current policies, that of uniform national electric tariffs. The multiple distribution companies will, by their very nature, have different cost structures and different tariffs.

Creating the independent regulator, the power pool, the multiple generating and distribution companies, as well as the other requirements, will be more difficult than it was in England/Wales, where a market economy and lengthy history of free enterprise already existed. *Even with prior experience in other industry restructuring, knowledgeable people available, and supporting institutions such as banks and capital markets in place, the process took years and the imperfections in what was created have not yet been resolved. This implies higher transition costs for Option 4. The regulatory challenges in particular will be greater, with a greater scope of regulation and more entities to be regulated.*

VIII. REGULATION OF THE SECTOR WILL BE NECESSARY UNDER ANY OPTION

Each of the structural models discussed in the previous chapter would need to be implemented with a regulatory framework tailored to its needs. Structure should drive regulation, but the choice of structure does not dictate precisely the form and function of the regulator. Rather, the design of the regulatory framework is, in the end, based on a judgment about what elements are best suited to the needs of Romania.

The analysis of the options highlighted the need for regulation. The primary concerns of the regulator in each option can be summarized as follows:

- Option 1 (Vertical Integration). Market power in generation, potential for discriminatory behavior, and incentive to misallocate costs.
- Option 2 (Single Buyer). Competitive procurement process, transmission and bulk supply tariff approval.
- Option 3 (Open Access). Open access transmission tariff, distribution and supply tariffs, ensuring arms-length transactions between different divisions of RENEL, and enforcing minimum IPP purchase requirements by RENEL distribution.
- Option 4 (Competitive Market). Competition and monopolistic practices concerns, oversight of the power pool operations, approval of distribution system planning, approval of transmission, distribution, and supply tariffs.

In addition to the question of what requires regulatory oversight, there is also the critical question as to the form of the regulation. *It is our belief that, where governments want to introduce large-scale private sector involvement into a monopoly industry, independent economic regulation (first and foremost, but not exclusively, the regulation of prices and investment) is always the best long-term choice. "Independent regulation" means that:*

- The regulator is appointed by the government, but cannot be removed easily.
- The regulator does not have to get approval from the government to raise or lower tariffs.
- The regulator is accountable to the tariff standards in the law (e.g., "just and reasonable"), not to the government.

For Romania, an independent regulatory agency that meets these criteria is the most sensible option for the long term, and would be essential for an unbundled, competitive system. But implementation of such a system of regulation could be a long, challenging process in Romania. There is no tradition of such institutions, which can be a significant barrier for the short term.

Four regulatory alternatives were identified:

- A Sub-Ministerial Agency where a distinct unit of the responsible Ministry would be created. Pricing approval would still be performed by the Ministry of Finance.
- An Inter-Ministerial Commission composed of representative from several ministries with electricity-related concerns with the Ministry of Industries and the Ministries of Finance assuming the principal roles.

- An Advisory Council which would be separate from the responsible ministries and may include officials from these ministries. The role of the advisory council is to offer high-level advice to the ministries. It would have limited statutory authority.
- Independent Regulation comprising a commission with a chairman. Each commissioner would have an equal vote. There would be an odd number of commissioners to avoid deadlocks. A five-member commission is probably appropriate for Romania.

Based on consideration of the options, we would recommend that if Option 2 or Option 3 is chosen, then regulation should be by either an inter-ministerial commission or an independent regulatory body. If Option 4 is chosen, an independent regulator would be essential.

IX. CREATING THE LEGAL BASIS FOR THE RESTRUCTURED POWER SECTOR

There are four core legal areas that should be addressed with respect to any option chosen:

- *Enabling Legislation.* The electric law should clearly set forth the authority pursuant to which the structure for the sector operates and should define the general parameters of that structure.
- *Regulatory Authority.* The law should provide for an independent regulatory authority, which must follow clearly expressed substantive criteria and function in an open, predictable, and reviewable manner.
- *Commercial and Investment Structure.* Private investment is a goal; laws dealing with commercial and investment issues should facilitate such investment.
- *Antimonopoly Control.* If competition is a goal, the law must set up a mechanism by which the government can deter and stop participants in the sector from obtaining monopoly control and engaging in anti-competitive behavior.

Each of the four options discussed in this report has different needs relating to each of these four critical areas of the law, and some options need more legal development in certain of these fields than others.

Each option will require fundamental changes in the electric laws to effect the structure and goals of the option. While the competitive market option would require the most change in the law, each option has certain uniform and basic needs: each requires laws that set forth specific substantive, enforceable criteria; create predictable, transparent, and reviewable procedures; and clearly delineate governmental and private-party rights and responsibilities.

X. HOW TO PROCEED

While the ideal goal of industry restructuring may be the competitive model, it is clear that present conditions in Romania and at RENEL do not offer the prerequisites to support that option over the next 10 years.

At the same time, while it would be relatively painless to select Option 1, it would do little to achieve the GOR's objectives for the sector. *Accordingly, the relevant long-run choice appears to be between Options 2 and 3. Successful implementation of either of these options would set the stage for an unbundled competitive model in subsequent years.*

Achieving meaningful sector change will require a transition from the current structure. We would recommend that the GOR proceed in a phased approach. The exact timing of each phase is difficult to predict with certainty at this point. *However, once a decision has been made to pursue a specific option, we would recommend that a high-level task force be established to oversee the process and ensure that all objectives are achieved.*

Four phases would be required for the Romanian power sector to evolve into a more competitive structure.

Phase I: Preparation

In this phase, which may require up to 3 years, the power sector would operate much as it does now. The principal activities would be as follows:

- The GOR would undertake policy evaluations and decide on the policy changes required to support the restructuring option.
- The GOR would proceed with Phase II of this study and adopt the resultant implementation plan.
- The GOR would act on new legislation for the power sector.
- The GOR would establish its objectives for valuation and, in conjunction with RENEL and others, commence to value RENEL generation assets.
- RENEL would continue with its commercialization and functional unbundling activities and least-cost programs.
- RENEL would continue with existing rehabilitations.

As outlined above, Phase I would establish a solid basis for fundamental reform to the sector. However, it could present the greatest challenges to the GOR because it will require a political commitment to change. *The successful completion of Phase I will send clear signals to both the domestic and foreign community that Romania is serious about restructuring and, hence, creating an environment for attracting new investment.*

Phase II: Creating the New Power Sector

In this phase, which could take up to 3 years, actions would have to be taken to put in place the fundamental elements required to make the option operative. These actions would include the following:

- The GOR establishes and staffs the regulatory function; the staff in turn proceeds to develop implementing regulations.
- Regulatory staff commence work on economic lifetime contracts and bulk tariffs.
- The GOR restructures RENEL into a holding company with separate business units, with the possibility of evolving into a joint stock company.
- Licenses and concessions are put in place for all generation.
- Bulk tariffs and economic lifetime contracts are developed.

In this phase, considerable time and effort will be required to get the necessary processes and procedures in place. The regulatory function will assume responsibility for overseeing RENEL's corporatization as well as the contracting process. RENEL would proceed to establish independent business units for generation, transmission, and distribution.

The above may give the impression that all the elements work in perfect coordination. In reality, this may not be the case, and we do not wish to minimize the significance of this issue. The creation of new business units may be impeded due to management inexperience, labor problems, or overall poor implementation. All of the activities outlined above will in turn depend on the timely development of the requisite institutions such as the regulator, the necessary contracting mechanisms, and an appropriate bidding process. If these are not in place, it will serve to impede the flow of capital into the sector.

Phase III: Initial Operation and Evaluation

In this phase, which could take up to 2 years, the structure and institutions developed in Phase II would be put in place and the results of operation evaluated to see how well they are performing and to make any necessary adjustments. In particular, the following factors would have to be monitored:

- Effectiveness of the new policy regimes on the power sector
- Performance of the regulator in reviewing contracts and the bidding process
- Effectiveness of the contracting mechanisms
- RENEL's performance as a holding company and transparency of its operations

- Responsiveness to investors' interest in new generating projects
- Where and to whom benefits are flowing

As noted above, this phase would provide the testing ground to see how well the system performs and to fine-tune its elements. The benefits of competition and corporatization should begin to emerge during this phase.

Phase IV: Final Operation

In this phase, any modifications from Phase III would be implemented and the power sector would be structured and operated based on the selected model. During this phase, additional decisions may be relevant, such as:

- Requiring RENEL to divest itself of additional generating assets
- Privatizing part or all of RENEL
- Need for GOR guarantees for new investment

During this phase, the full benefits of the competition envisioned in Options 2 and 3 would be realized. The role of the GOR in the sector would be minimal, and private capital should move into the sector. However, there is a danger that the benefits accruing from these so-called intermediate options may be so positive as to decrease the GOR's enthusiasm to proceed to the more fully competitive Option 4. Such a tendency should be resisted if it is very clear that further benefits can be achieved by implementing this option; otherwise, Options 2 and 3 will still provide for sustainable long-run benefits.