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HUNGARIAN COMPETITION STUDY: THE REGULATORY AGENCY

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Introduction

This paper is one in a series exploring the potential impact of greater competition in the Hungarian electricity sector The general purpose of the study is to analyze the effect greater competition in the sector could have on sector participants and on the Hungarian economy in general While these papers focus on the competition required by the EU Directive on liberalization of the electricity market, they also explore whether more competition, beyond the minimum required under the Directive could provide additional net benefits

Each paper examines the issue of greater competition from a specific perspective One paper focuses on the impact different potential ownership arrangements within the sector could have on the sector and economy Another paper examines various trading models – the status quo, minimum change under existing law, minimum change to meet EU requirements, and more competitive models, with pools, direct access and/or bilateral trading arrangements A third paper looks at financial issues, such as stranded costs and the possibilities and ramifications of potential bankruptcies A fourth paper concentrates on technical issues, identifying constraints or advantages that could result from the injection of more competition into the sector

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This particular paper focuses on the role of the regulatory body overseeing activities in the sector the Hungarian Energy Office ("HEO") The paper identifies the changes in the

2 Planning

MVM is legally responsible for local demand forecasts and security of supply The State retains control over future construction of generation through adoption of a government establishment plan and a licensing procedure for new plant which requires consistency with the plan and/or governmental approval to build.

3. Retained Monopoly Structures

Only one transmission company is permitted by law With limited exceptions, distributors are licensed to operate within exclusive service territories and are obligated to serve all customers within those territories There is no compelled third party access Public plants must offer their power to MVM [1]

4 Licensing

All generation (except small plants) must be licensed by the HEO Transmission and distribution companies must also obtain licenses from the HEO

5. Pricing

The Ministry of Industry, Trade and Tourism ("MOITT") sets tariffs, with HEO input as to the appropriate formulae to follow in setting prices

6. Long-Term Contracts

Generators enter into long-term contracts with MVM to sell power; MVM then enters into long-term contracts to sell and transmit that power to distributors

[1] The Electricity Act (§21(3)) provides that, on behalf of a generator, the HEO can license direct supply for certain consumers (in which case the generator is considered a distributor) The law does not include any further parameters for this authority This avenue appears to provide only a very limited exception to distributor monopolies within their service territories

5 Consumer Protection

Under the Electricity Act, the HEO is charged with ensuring customer demand, standardization of services, and consumer protection Technical standardization and security of supply is implemented through the HEO's approval of the Operational Code, which must be followed by anyone connecting to the grid The HEO also approves licensees' business rules (in consultation with consumer organizations), establishes the order of restriction to consumers in emergencies, investigates consumer complaints, and resolves consumer disputes if conciliation attempts fail.

II. The Current Organization of the HEO - How it Regulates

Generally speaking, the HEO has limited independence and resources

A. HEO Structure

A chart setting out the HEO's structure is attached hereto as Appendix 1 As indicated therein, there is one Director General (President), two Directors (Vice Presidents) (one in charge of licensing, the other in charge of pricing, consumer protection, energy conservation and complaints), a director of internal financing, and a legal and management department. There are a total of 58 employees, many of whom are part-time The agency is funded entirely out of the fees it charges, those fees are not set by the HEO, but rather by the MOITT and Ministry of Finance ("MOF"), through a joint decree (29/1994 (XI 4) IKM-PM) Last year, the HEO's revenues from those fees amounted to 335,383,000 HUF

Some salaries of HEO personnel are set uniformly pursuant to Act XXIII of 1992 on Civil Servants (with various adjustments) They are low as compared to the HEO's private sector counterparts. Other salaries differ from governmental body to governmental body, and the

the sector, has pragmatically maximized its independence to the extent possible under its current legal and financial constraints

For example, currently, statutory limitations on common ownership of sector assets and sector re-aggregation is weak to non-existent. In the absence of such law, the HEO has stepped in by including ownership restrictions in the terms of the licenses it has issued Thus, to the extent the law has given the HEO some power (e g , the power to license), the HEO has attempted to exercise that power as aggressively as legally and practically feasible

The HEO's expertise has also presented an avenue for exercise of some authority For example, governmental authorities looked to the HEO for advice as to the minimum level of service that must be provided during strike situations, despite any requirement that the HEO be consulted

Ultimately, however, these more informal avenues for exercise of independence are restricted by law and practicality For example, the statute relating to striker rights prevents the HEO from enforcing any minimum level of performance others have asked it to establish compliance by the workers must be voluntary.

C. Process

The HEO operates under a mix of formal and informal processes Formally, the Civil Procedure Act applies (except that the administrative deadline is changed to 90 days) Applicants (or other aggrieved parties) do not have the right to a hearing before the HEO regarding its decisions They do, however, have appeal rights to the MOITT and, thereafter, to court [4]

[4] The only public hearing that must be held relates to issuance of an establishment license That hearing, however, is held before a panel of experts, not the HEO (73/1996 (V 22) Government Decree)

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Examples of how regulators are organized and act within the non-competitive model can be found in countries with vertically integrated monopolies In the United States, for example, prior to the introduction of competition in the market (commencing in 1978 and accelerating this decade), public utility commissions at the state level, and the Federal Energy Regulatory Commission ("FERC") at the federal level, imposed comprehensive substantive rules on the limited number of sector participants, monitored their activities very closely, and essentially restricted how the sector participants could operate within very narrow parameters Because they set all prices these regulators reviewed and approved all utility cost inputs and profits They approved all major investments, required utilities to create integrated resource plans, and imposed rules as to demand side management.

Because consumers are supplied through a monopoly in a non-competitive model, these regulators also imposed detailed rules regarding the utility-consumer relationship, and to resolve disputes between the consumer and the monopoly.

This sort of comprehensive oversight requires a regulatory body with many employees and a large budget Materials reflecting even recent US (state and federal) budget and organization structures are attached hereto as Appendix 2. As one example, in 1995, FERC had a budget of approximately $170 million and still has over 1300 employees In addition to this federal oversight, within the State of Illinois alone, with a population of approximately 12 million, the state utility commission (the "ICC") in 1995 had a budget of approximately $30 million and staff of 310 Pennsylvania, also with a population of approximately 12 million, spent $40 million in the fiscal year ending 1995, with 581 employees

serving a country a population of 34,600,000, has only 75 employees (For a chart of ENRE's structure, see Appendix 5)

III. The Models in Practice

A. In Concept

Conceptually, the two ends of the regulatory spectrum reflect (1) a large bureaucracy engaging in close oversight in the non-competitive model, and (2) a leaner, less intrusive reference in the competitive model

Because the regulator in the non-competitive model spends its time imposing substantive rules on sector participants, it requires engineering and financial expertise similar to the personnel requirements for the utilities themselves Indeed, the regulator in a non-competitive model essentially mirrors the skills and knowledge of the utility, in order to determine whether the utility is functioning as efficiently as possible

At the other end, the regulator in the competitive model acts as an anti-monopolist. The market, not the regulator, oversees the efficiencies of the sector participants Thus, the regulator in the non-competitive model primarily requires economic and financial expertise

B. In Practice

In reality, the differences between regulators acting within these models is not as stark as theory would predict For example, regulators in the United Kingdom have engaged in more aggressive price review than first anticipated, injecting substantive oversight into their roles Aspects of the electricity sector remain a monopoly in any model (e g , transmission) The perception of electricity as a human right as opposed to a non-essential commodity requires the

[9] It is also advised by 14 Electricity Consumers' Committees (one for each regional electricity supply company in England, Scotland and Wales) Each of these Committees has between ten and twenty volunteer local members and a chairman

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head, e g a three to seven member panel, ex parte communications are limited or prohibited, decisionmaking occurs in public, and strict conflict of interest rules apply.

When the electricity sector is both privatized and made competitive, the need for perceived objectivity becomes even more important, because the primary purpose of the regulator is to ensure a level playing field among multiple sector participants Regulator independence thus becomes even more important under such a sector model

ENRE is thus autonomous (it is a quasi-state agency affiliated with the ministry of economy and funded by in sector participants' rates) It has five members (selected by the government), and conflict of interest rules have been imposed -- they cannot have any economic interest in the entities within the scope of their regulation

Similarly, while only one Director General heads OFFER (with a fixed term of office), it is an independent, non-Ministerial body, empowered by statute to recover its full economic costs through the fees it charges on sector participants

ANALYSIS

I. EU Directive Requirements

The guiding premise of both the Treaty of Rome and the EU Directive is to create a common European market in which persons and entities from the various member countries compete on a level playing field The Directive requires increased competition in the electricity sector, and an objective, transparent and non-discriminatory process for reviewing governmental decisions affecting the sector At a minimum, therefore, to meet EU requirements, the HEO (or another regulatory body) must take on new duties to ensure acquisition and maintenance of the minimum market access required under the Directive The HEO (or another regulatory body) must also perform this function in an objective, transparent, and non-discriminatory manner

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electricity generation, transmission and distribution activities" to "be responsible for the organization, monitoring and control" of the tender procedure

Again, these duties must be performed in an objective and non-discriminatory manner, using transparent procedures Authorization and tender processes must apply "public" "objective, transparent and non-discriminatory criteria" (Art. 4, 5(2)), applicants must be informed of the reasons for any refusal to grant an authorization, "which must be objective and non-discriminatory well founded and duly substantiated", and appeal procedures must be available (Art 5(3))

II. Other EU Requirements

The Treaty of Rome imposes other requirements requiring competition. Article 86, for example, prohibits abuses of a dominant position by one or more undertakings (businesses) Article 90(1) imposes obligations on member states relating to businesses to which they grant special or exclusive rights (such as a transmission or distribution company's monopoly) Exemptions are provided, but limited

Articles 85 and 86 prohibit anti-competitive behavior and abuse of dominant market provisions. Member states must notify the Commission about contracts which could be deemed void as preventing, restricting or distorting competition in the common market, or the parties to the agreement are exposed to fines

Pragmatically, this means that the substantive law in Hungary should prevent this sort of anti-competitive behavior, and some regulatory body should monitor the law's implementation While theoretically all such oversight could be left to a general, anti-monopoly regulator, in practice the regulator in charge of energy sector participants is often at least consulted when decisions are made regarding anti-competitive behavior within the sector

competitive model (During the transition, additional resources would probably be required) Such a change would also require different expertise within the HEO For example, it will be more important to have staff with economic, financial and legal expertise

TOPICS FOR FURTHER STUDY

1 The impact of budget increases

Currently, the HEO is self-sustaining -- it is funded by the fees it charges to sector participants -- but it is not sustaining itself very well. The impact of changes in the fee structure to increase the HEO budget should be analyzed

2 Analysis of similar regulatory bodies

Once Hungary decides on the level of restructuring of the sector it wishes to make, a more detailed analysis of the HEO's needed staffing, budget and expertise should be undertaken, including a closer examination of existing regulators operating within a similar sector model

RECOMMENDATIONS

1 Increase HEO independence

- instead of one President, create a governing board with staggered, fixed terms of appointment

This recommendation would require a statutory change (probably an amendment to the Gas Supply Act)

- give the HEO the right to set its own fees and salaries and increase its budget

This recommendation would probably also require a statutory change, but might be partially achievable through a joint MOITT- MOF decree indicating deference to HEO fee calculations Even in the absence of statutory change, greater deference to HEO calculations in practice would probably not only aid in increasing investor perception of agency independence, but could lead to greater accuracy in determining appropriate levels of funding As the agency in

Participants in the sector need to know what rules exist, and that those rules will be applied evenhandedly Therefore, the more formal and explicit the rules (that is, the more a rule is embodied in a statute as opposed to a decree or non-binding internal guideline), the more confidence the sector participant has that those rules will be enforced Even in the absence of a statutory change, however, the Competition Office and HEO can explicitly set forth between themselves their understanding of their respective duties in regulating and preventing anti-competitive behavior These two agencies could jointly promulgate guidelines, consistent with existing law, which spell out how they delineate their duties, and how they intend to cooperate with each other The more public such guidelines, and the more consistently they are followed, the more helpful the existence of such guidelines can be in increasing sector participant confidence in the system

The Competition Office and the HEO could form a joint committee right now to analyze existing law and to draft guidelines setting out the duties of each agency and how they intend to work together to fulfill those duties

2 Standardize and open up HEO processes

- give the HEO the power to issue general decrees and guidelines

This recommendation would require a major change in the law Right now Act XI of 1987 on legislation prevents any agency from issuing binding regulations Either this law would have to be amended, which would then apply to all agencies generally, or the Gas Supply Act would have to be amended to allow the HEO to have special powers beyond those given to other agencies In either instance, politically, such a change would be difficult to achieve One argument in favor of giving special, greater powers to the HEO than to agencies outside the sector could be that the EU Directive encourages, if not requires, a certain degree of

One specific example of a subject needing more explicit regulatory development is ownership limitations Ideally, a statute should impose specific limitations, and give the Competition Office and the HEO authority to impose more detailed restrictions In the absence of a such a statute, the MOF, MOITT, Competition Office and HEO could work together to issue a joint MOF-MOITT decree spelling out what ownership will be allowed, what ownership will be deemed anti-competitive, and how the Competition Office and HEO will jointly regulate anti-competitive behavior

- standardize communication avenues among the HEO, applicants and other interested parties, create a hearing process for decisionmaking, and promulgate general rules as to the processing of applications

Right now, the HEO must follow the Administrative Procedure Act No other procedural rules apply While current limitations on the HEO's ability to issue general decrees restrict the HEO's ability to promulgate binding procedural rules, it can at least create, publish and follow internal guidelines standardizing its treatment of applications and other regulatory conduct

One example of an area where such standardization could be beneficial is treatment of deficient filings. When an applicant files a deficient application, omitting needed information, it would be helpful if the HEO had a published protocol, consistent with but more specific than the Administrative Procedure Act, indicating how the HEO will respond The protocol could indicate, for example, that (1) the HEO will review all applications of specified types within X number of days for completeness, (2) if it finds that some material is missing, the HEO will communicate that deficiency to the applicant within Y days and give the applicant Z days to respond, and (3) if the applicant fails to respond or the response still leaves deficiencies within the allowed time, the HEO will then rule on the application as is (or take some other specified behavior consistent with the Act)

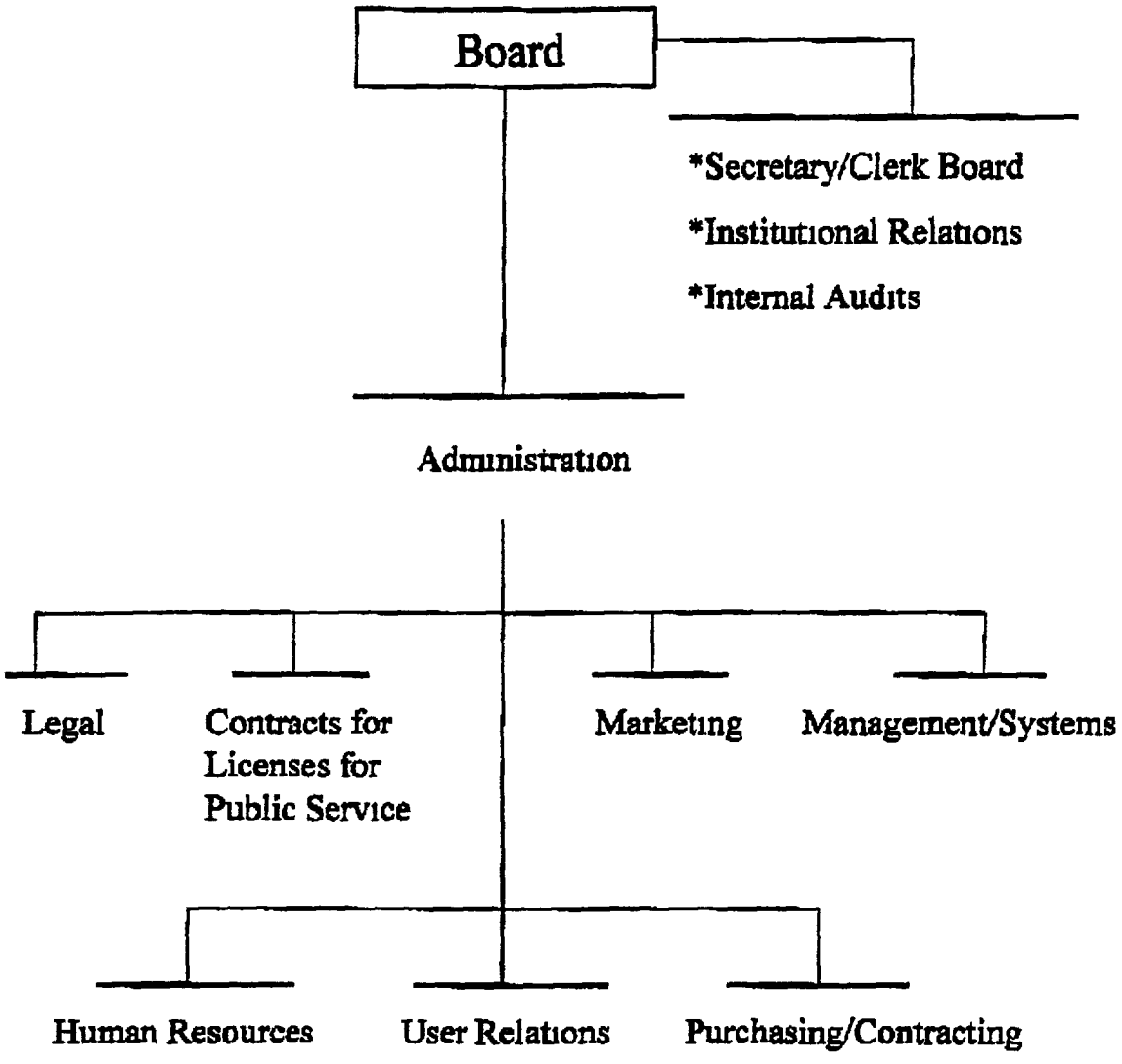
protocol in place for channeling objections and making its decision All interested parties would understand the process for making the decision, how they could be heard within that process, and would know that no additional, ex parte meetings were taking place

Such standardization through guidelines and protocols (or, if available, more binding decrees or statutes) would not only increase perceptions of transparency, objectivity and non-discrimination, but could also make the decisionmaking process more efficient, by avoiding multiple, ad hoc meetings and communications Contact with the HEO would be consolidated and streamlined

INTERNATIONAL BOARD OF ELECTRICITY

(ENRE)

ORGANIZATIONAL STRUCTURE



THE REGULATORY AGENCY

ELECTRICITY TRADING MODELS FOR THE HUNGARIAN MARKET

Bechtel International Consulting Group

Electricity Trading Models for the Hungarian Market

August 1997

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I Overview

This paper discusses alternative approaches for developing a more competitive electricity industry in Hungary under the existing legal framework It also discusses alternative market structures that will conform to the minimum requirements of the European Union (EU) Directive on internal market opening Implementation of these models will require legislative reform that at a minimum will provide customers non-discriminatory access to the transmission and distribution networks of MVM and the supply companies

First, the paper examines the options posed by the Directive Specific questions are raised as to how the Directive might be met in the Hungarian context Second, the paper reviews the alternatives faced in the design of any electricity trading system An Appendix expands on the issues in developing trading models from a conceptual perspective Third, the paper discusses the deficiencies of the existing market structure and offers an alternative structure within the existing legal framework The recommendations associated with this structure seek to maximize the Hungarian Energy Office's (HEO) existing authority to enact pricing reforms that will facilitate the operation of a competitive market under more progressive market structures and to vigorously promote competition in the entry of new generation into the market Finally, the paper specifies three alternative models for the Hungarian market structure with the basic advantages and disadvantages of each alternative

II. EU Options and the Basic Questions for Hungarian Market Structure

A EU Directive

The EU Directive requires a series of conforming reforms for all EU members in several key areas [1] These reforms are to be phased in beginning by 1999, with extensions for some member states While the Directive specifies a six-year phase-in period to full compliance, the pace of Hungary's compliance with the Directive is dictated by the European Agreement between the Hungarian government and the existing Member States The European Agreement provides for a transition period having a maximum duration of 10 years

From the perspective of establishing a new market structure in Hungary, the reforms required by the Directive can be grouped into three areas

- Generation additions Member States must establish objective, transparent, and non-discriminatory procedures for the authorization of new generating capacity If the Member State's regulated buyers are soliciting for this capacity, the tendering process must be independently organized, monitored, and controlled

- System access System access to the transmission system and electricity market in the member states must be by either a single buyer or negotiated access approach that allows customers to have

[1] This has been summarized in greater detail in earlier papers "Potential Conflicts Between Existing Hungarian Law and the European Union Directive on Liberalization of the Electricity Sector " March 1997, "Implications of EU Laws for Electricity Industry Reform in Hungary " January 1997

access to buy electricity from existing or independent producers End users gain access starting (in general) in 1999 for customers of 40 gWh/year use (about 5 MW average load), dropping to 20 gWh/year use in 2000 (about 2 MW average load), and 9 gWh/year use in 2002 (about 1 MW average load)

- Separation of generation, transmission and distribution functions and price unbundling this area addresses issues of transmission system operation independence or separation from generation and distribution and the unbundling of accounts for generation, transmission, and distribution activities These reforms are required in order to separate the competitive segment of the industry (i e , the supply of capacity and energy) from the functions that are inherently monopolistic (i e , transmission and distribution wire service)

The Directive does not dictate a specific market structure per se Therefore, alternative market structures can be formed that may have an operational structure that leads to different patterns of ownership of assets, and forms of contractual relationships between market participants related to both the physical and financial trading of electricity

B The Basic Questions

The design of any electricity sector changes for Hungary must address these specific EU Directive issues as well as monitoring the worldwide trends toward the regulation of the electricity sector via market / trading schemes This design can be posed as a series of questions First, does Hungary want a transmission and trading system to

- Preserve the Status Quo and not comply with the Directive Given Hungary's commitment to join the EU, and the obligations to which it has committed in the European Agreement This is not a realistic alternative

- Make changes within current legal framework to move toward a more competitive market and EU compliance (Model #0) This is a preferred approach but only as an interim measure The current legal structure of the Hungarian electricity sector will not permit compliance with the Directive

- Enhance the existing current single buyer model or allow negotiated transmission access for large end users and generators on EU timeline with minimal EU compliance on direct access by large electric customers (Model # 1)

- Create a pool-based system with wholesale and staged development of retail access (Model # 2), or

- Create an open access transmission and distribution model, with transmission scheduling coordinated by an independent system operator, with bilateral trading of electricity at the wholesale level and staged development of retail access (Model #3)

The second question is the pace and scope of reform How quickly should Hungary open its market to competition? Should competition be restricted to the wholesale level or expanded to the retail level? Should non-traditional entities such as power marketers and brokers be permitted to participate? Should Hungary move through several different models in a planned trajectory in the transition to EU compliant model?

Finally, this policy effort needs to address the existing commitments under the initial electricity sector privatization and other economic reforms occurring in Hungary and in adjoining countries in the region

This paper raises two additional issues

- The first question relates to how the costs of the transition from a monopoly to a competitive market will be recovered Specifically, the opening of the market to competition, in the absence of a transitional mechanism, may result in under recovery of the investment cost of existing generating capacity to the extent that it exceeds the market value Policy options for addressing these so-called stranded cost are discussed in the companion paper " "

- The second question is to what degree should Hungary go beyond the minimum requirements of Directive? What benefits or costs might this bring? What is relationship to neighboring pools or markets? What opportunities are available to Hungary because of its position in the European energy market?

The answers to these last two questions are beyond the scope of this paper

III. Building a Trading Scheme

Any scheme that introduces greater competition through market-oriented electricity trading must address a series of basic questions about the "What, When, Where, Who And How" of the trading system These are the basic issues that must be covered in the design of any electricity trading model

- What is traded through the operation of a competitive market That is, what are the discrete services or functions performed in the provision of bundled wholesale and retail electric service that can be unbundled and valued in a competitive market
  - Short term, non-firm energy, short-term energy and capacity, long-term energy and capacity?
  - Ancillary services (voltage control, frequency regulation, load following, losses, reactive power supply)?
  - Energy and capacity bundled with transmission?
  - Leave the system with all requirements service to end-users, but with unbundled rates?

- When does the trading occur and how long is the period covered?
  - Over what length of time are the energy and capacity commitments made?
  - How far in advance of the actual dispatch and delivery are the trades made and confirmed?

- Where is the point of sale between buyers and sellers?
  - How many market trading points for the purchase and delivery of energy and capacity?
  - How is transmission integrated with the energy? Via real time nodal pricing? Or are zonal or a time-of-use postage-stamp transmission rates efficient enough to avoid the more complex transmission pricing schemes?

- Who participates in the market?
  - Who are the buyers and sellers allowed? Generators? Suppliers? End-users? Big end-users, small ones? High voltage end-users, or at all levels?

- Are intermediaries allowed beyond generators and end users, such as MVM, the distributors, or third party power marketers and brokers?
- Who settles the trading and schedules actual deliveries? Which end users and generators may participate? Who acts as clearinghouse and how independent of other entities does this clearinghouse need to be?

- How is the trading carried out?
  - Is the trading public? For quantities or both quantities and prices?
  - How quickly is information released?
  - Does the central settlement process only involve energy, capacity, transmission, and ancillary services or is money exchanged directly in the settlement process through a central clearinghouse or some or all ancillary services as well?
  - Are prices for some or all components set in a central exchange or are prices and terms set bilaterally?
  - What infrastructure and systems (e g , metering and real-time information systems) must be developed to coordinate this trading?

The Appendix elaborates on these issues from a conceptual perspective

Figure 1 illustrates the range of these choices Of these questions the key issues that must be addressed in specifying alternative models are

- The degree of end user participation -- The most significant factor influencing the extent of the electric industry restructuring is the degree of end-user access to the trading and transmission system for custom, competitive buying of electricity needs As the market is opened to smaller and smaller users, the degree of change in the market and market relationships expands For example, only 41 customers and 19% of the energy use is by customers at the largest, over 40 GWh/year EU Directive customer group At the 9 gWh/yr and above level, this expands to 203 customers and 29% of the energy use -- five times as many end-users in the market Of course, as the number of customers served by market-based pricing expands, the degree of stranded cost risk for the existing industry players increases

- The extent to which intermediaries will be allowed to participate -- The development of wholesale and retail market intermediaries or "power marketers" influences market liquidity and, because of the natural interests of the power marketers, speeds change in the traditional buying relationships

- The degree of centralization in the trading, both for energy scheduling and for exchange of money -- The electricity network requires some centralized physical coordination of transmission, generation and ancillary services However, a broad range of alternatives exist for the degree of financial or economic coordination, from a centralized financial settlement process for all transmission, generation, and intermediary activities to only billing for transmission use

What Competitors Do You Allow? Illustrating the Range of the Competition Dimension

- In Generation
  - Development and Purchase from IPPs via Authorization and Tendering
  - Development from IPPs via Authorization and Open Merchant Buying
- In Wholesale Markets
  - Only Generators and Buyer(s) for End Users Via Single Buyer Scheme (Distributors and Direct)
  - Only Generators and Buyer(s) for End Users Via Bilateral Trading (Distributors and Direct)
  - Generators, Buyers, and Intermediaries Via Bilateral Trading (Wholesale Power Marketers)
- In Transmission
  - Only Monopoly, Unbundling of Transmission Rates and Ancillary Services
  - Independent System Operation with Independent Development
- In Retail Marketing and Supply
  - Distributors Only, Distribution and Energy Rates Unbundled
  - Distributors and Generators Selling to Limited End Users
  - Retail Marketers, Distributors, and Generators Selling to End Users

Figure 1

The four alternative Models for Hungary, presented above, package these choices in a range from minor changes (Model #0) in the current market structure to comprehensive wholesale and retail market reforms (Models #2 and #3) Figure 2 presents a classification of the alternative models shown on the dimensions of degree of access, the number of intermediaries allowed and central versus bilateral exchange

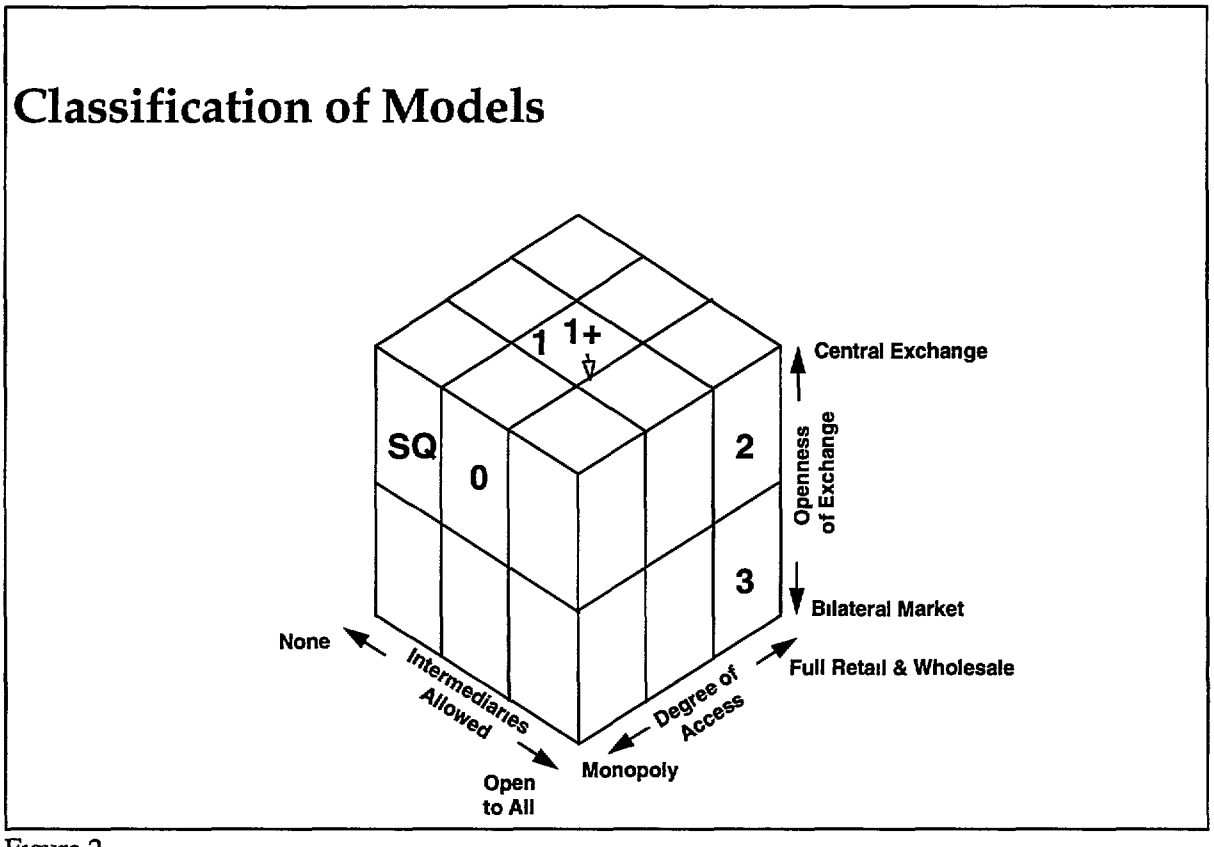

Figure 2

IV. Alternative Models

The range of alternatives posed by the conceptual discussion, in Section III, has been organized into a limited range of alternatives as a few basic models This section discusses these basic models

A Status Quo Why Is It Unacceptable?

Retaining the status quo of the existing market structure in Hungary is not acceptable to either the Government or the regulator for three reasons First, the current legal structure provides for a monopoly market structure that precludes competition beyond market entry by new generators Second, the current form of price regulation (i e , bundled pricing), while consistent with the economic regulation of a monopoly, is inefficient and not transparent to customers Third, the current legal and market structure is not consistent with the requirements of the EU Directive Figure 3 provides an illustration of the current market structure

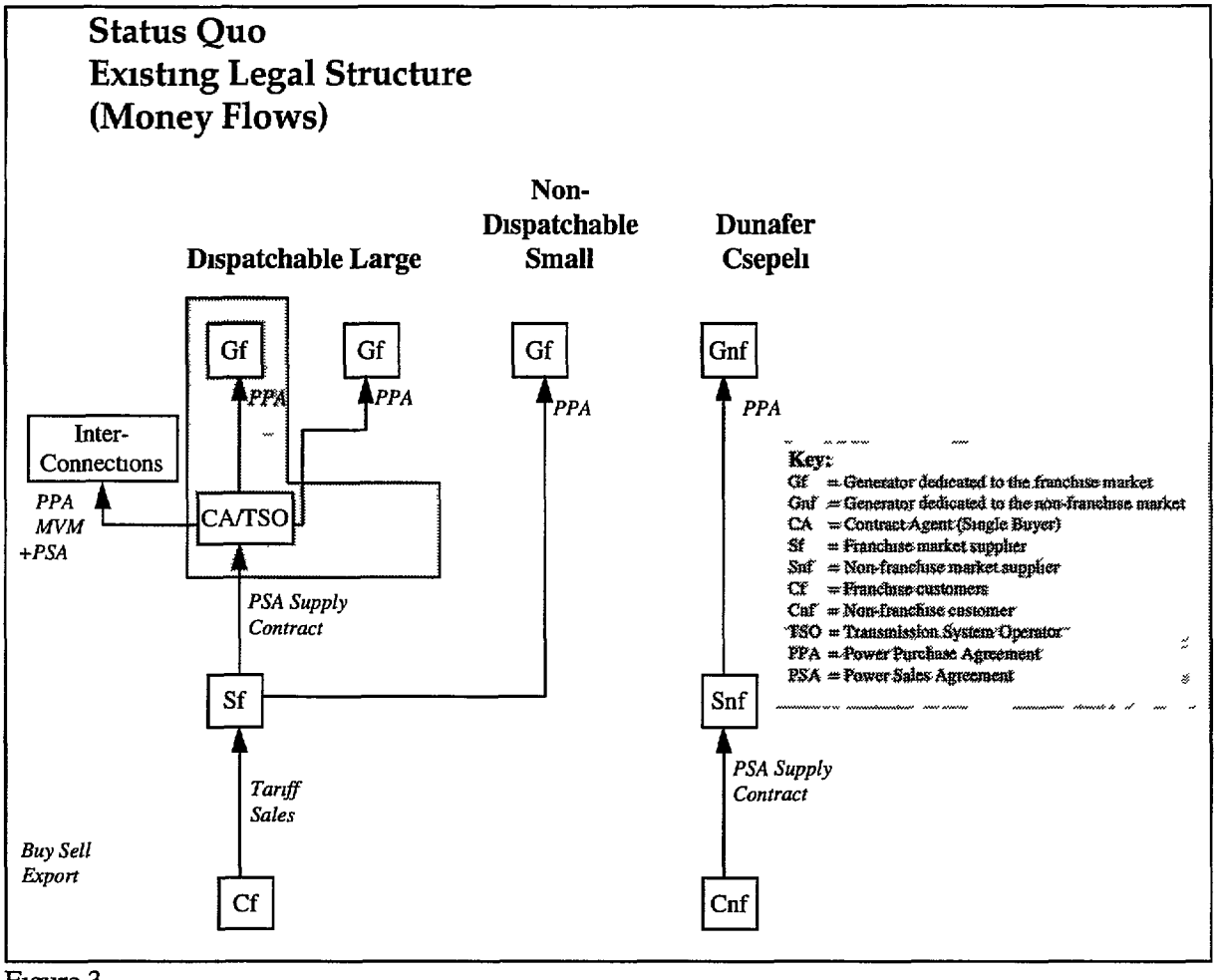

Figure 3

1 Structural Impediments to Increased Competition

Notwithstanding the structural reform that has resulted in the functional separation of generation, transmission and distribution and the diversification of ownership through privatization, the Hungarian power sector continues to operate as a monopoly The Electricity Act contemplates economic regulation of a lawful monopoly and the industry has been restructured accordingly The monopoly status of the industry is reflected in four elements of the Electricity Act that are implemented through licensing conditions, government and ministerial decrees and contracts between existing companies They are as follows

- The supply companies' operate under a statutory obligation to serve mutually exclusive services area [2] With the exception of conservation, ripple control, self-use and the supply of new generation from direct supply licensees authorized by HEO, the supply companies are insulated from competition to serve retail customers within their designated supply areas

[2] See Act XLVIII, Sections 21 and 43

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- MVM has a statutory obligation to plan for and acquire resources to meet the supply company's long-term requirements [3] In recognition of MVM's statutory obligation to serve the supply companies, a reciprocal purchase obligation is imposed on the supply companies as a condition of their licenses issued by HEO [4]

- Neither the supply companies nor retail customers have access to the transmission and distribution network to reach alternative sources of supply And, with limited exceptions, the Electricity Act requires generating companies to sell their capacity to MVM

- In exchange for the right to operate as lawful monopolies, MVM and the supply companies are required to submit to regulation of their costs and profits [5] This form of economic regulation is intended to limit MVM's ability to exercise market power as the single buyer/seller of wholesale power to the supply companies who currently do not have direct access to alternative suppliers It also controls the supply companies in their potential exercise of market power over captive retail customers

Based on this legal structure, the once vertically integrated MVM has been functionally unbundled and the sector as a whole is now vertically integrated by contracts Exclusive franchises still exist Mandatory service obligations prevail and customers remain captive to the system with which they are directly interconnected Competition exists only at the margin in the form of self-generation, direct supply licenses, competitive bidding for new capacity, conservation and ripple control In short, there is no systematic form of regulation in place that affirmatively promotes these forms of competition that can exist under the current legal framework

2 *Price-Related Impediments to Increased Competition*

The current form of pricing also makes the status quo unacceptable Both MVM and the supply companies price their services on a bundled basis As a result of bundled pricing a number of inefficiencies have or are likely to emerge under the status quo

- Bundled pricing permits cross-subsidies among customer classes that may foster inefficient demand and in the long run an inefficient allocation of resources Since 1994, the average price of electricity to households has gradually increased such that it now exceeds the average price to non-households However, it is not clear that the current rate design is void of cross-subsidies Such subsidies if they exist could not prevail in an open access environment

- Supply companies are not being compensated by MVM for loop flow over subtransmission facilities operated in parallel with MVM's high voltage network Unbundling retail rates to determine the cost of distribution wires service would allow for the pricing of loop flow Recognition of the cost of loop flow will provide for efficient expansions of both the distribution and transmission network to relieve network constraints It is also not clear if the supply companies are adequately compensated for MVM's use of their facilities in order to dispatch generation interconnected to a supply company's facilities

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[3] See Act XLVIII, Section 42 Section 42(1) sets forth MVM's obligation to serve the supply companies and requires that it be implemented though contracts on a non-discriminatory basis

[4] See Part II, Section 5 Obligation to Purchase from Transmission Company of the supply companies Operational License

[5] See Act XLVIII of 1994, Section 55(1)

- The absence of unbundled transmission rates (wires service and ancillary services) and lack of information identifying system constraints may result in foster inefficient location decisions under capacity tendering procedures The absence of unbundled transmission rates also creates the potential cross-subsidization of network expansions and the costs to interconnect new generators to the grid Lack of distance-sensitive transmission pricing (if such differentials exist) may also foster inefficient location decisions for new capacity

- Nationwide retail rates as opposed to supply company-specific rates may provide inefficient price signals to consumers depending on the variation of individual supply company costs relative to the industry average Under these circumstances those supply companies whose costs are below the average will realize a windfall and those above will realize a shortfall in revenue relative to their costs

3 Impediments to Conforming to the EU Directive

There are numerous conflicts between the EU Directive and the current legal and market structure that will have to be resolved in order for Hungary to be in compliance The two most significant elements of the Directives that are lacking in the current legal structure are

1 Non-discriminatory access to transmission and distribution wires service, and
2 A transparent authorization or tendering process for the supply of new generating capacity

With respect to access, as noted above, neither the supply companies nor individual retail customers are able to contract directly with generators or from the external electricity market either through direct connections or via access to transmission and distribution wires service [6] Nor are they able to realize the equivalent economic result through the single buyer structure that is contemplated by the Directive Second, the capacity tendering procedures currently under consideration by the Ministry of Industry and Trade, in consultation with MVM, do not appear to conform to the requirements of the Directive

Three other elements of the current market structure are not in conformance with the EU Directive

1 The first is the limitation on imports prescribed in Decree 29/1995
2 The second is the lack of independence between MVM's dual role as transmission system operator/system operator and its merchant function and continued ownership of generation
3 The third is unbundling

The 15 percent of annual consumption limit imposed on imports potentially precludes conformance with the phased opening requirements of Article 19 of the Directive Based on 1995 data, customers with load in excess of 40-gWh account for 18 9 percent of the total domestic market

The lack of independence between MVM's merchant function and transmission system operator function will provide it the opportunity to exercise market power under any competitive model premised on non-discriminatory open access MVM' s ability as system operator to share market sensitive data with its merchant business to the exclusion of competitors as well as its control of essential transmission facilities will give it an unfair competitive advantage absent adequate regulatory safeguards

Article 7 of the Directive requires separation of functions in the absence of compete divestiture of generation and the transporters abandonment of a merchant function Article 14(3) requires unbundling

[6] Except for the supply companies' limited authority for low voltage imports (under 35kV, under 5% of sales for the supply company, and with the waiver of MVM) and limited low voltage exports to non-integrated areas (under 35kV) as allowed in Decree 29/1995 Section 3

to ensure transparent pricing and the elimination of cross-subsidies with internal accounting by activity As described above, the current pricing methodology does not meet the unbundling requirement However, MVM and the supply companies, as conditions of their respective licenses, are required to implement transparent accounting systems to prevent cross-subsidization of their basic transmission and distribution services from ancillary and secondary activities Thus, the cost information framework is already in place to facilitate unbundling of MVM's wholesale rate

B Model #0 Enhanced Status Quo -- Increased Competition Within Existing Legal Structure

Model #0 is intended to move toward the Directive prior to Hungary's admission to the EU There are several potential changes

- Separate accounting for generation, transmission, and distribution activities in entities like MVM that retain control over more than one of these functions This is a first step in the process of unbundling prices for these services
- Require MVM processes and organization that would pass general standards for independent transmission access for entities wishing to transmit power into, out of, or across Hungary via sales or transmission under existing market structure This is move would not require open access, but would establish the internal MVM processes and organization that would simulate open access for the existing generation purchasing activities of MVM
- Adopt formal standards for direct supply that might allow additional direct access under existing law for a large customer classes on an ad hoc basis This is subject to potential domestic and international legal constraints on the issuance of these licenses and the overall privatization agreements
- Establish and publish specific regulatory criteria and processes for the authorization of new generation facilities, including self-generation plants

To move toward a more competitive market structure, including a structure that will meet the minimum requirements of the Directive will require legal and regulatory reform Nevertheless, within the current framework, opportunity exists to promote competition in limited forms and to reform existing regulations to hasten the transition to a more competitive market structure once the necessary legal reform has been enacted [7]

- Competition in market entry for the supply of new generating capacity,
- Wholesale price unbundling and transmission pricing,
- Retail price unbundling, and
- Promotion of exports by supply companies

[7] The recommendations in this section of the paper are based on an aggressive interpretation of the English versions of the Electricity Act Decrees and operating licenses To the extent the English versions of these documents do not precisely convey the meaning or intent expressed in Hungarian some of these recommendations may have to be modified or retracted to conform to the precise meaning of the law

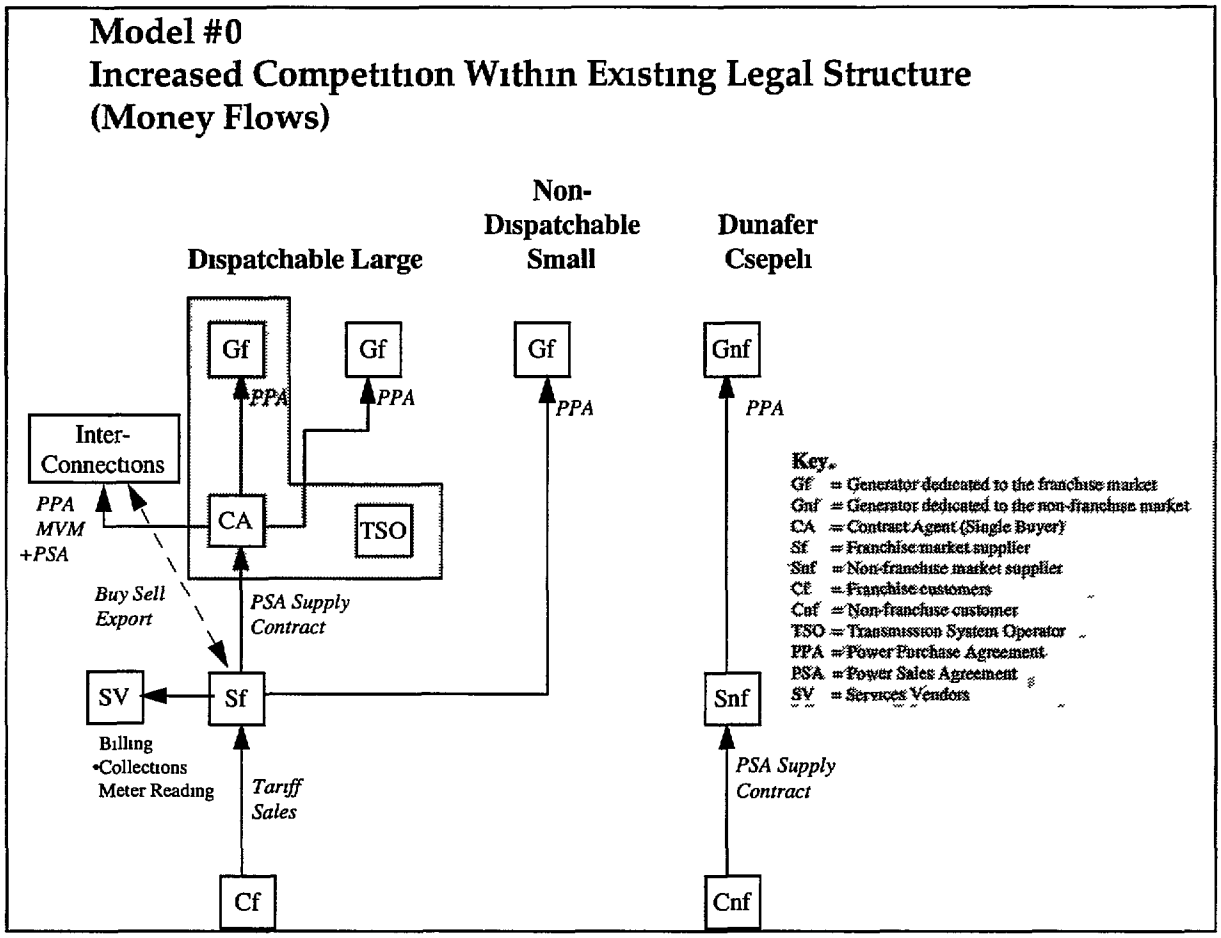

Figure 4

The structure of the power sector under Model #0 is illustrated in Figure 4 For purposes of this discussion MVM's merchant function is defined as Contract Administrator (CA) Its role as transmission system operator and dispatcher is defined as Transmission System Operator (TSO) Because Model#0 is constrained to comply with the existing legal framework it does not produce a significant structural change in the industry The principal changes are the separation of MVM's merchant and transmission system operator functions and certain elements of services provided by the supply companies -- but does not force open access transmission for MVM, but requires separation for the current transactions The majority of the recommendations discussed below relate to pricing and the adoption of generic regulations to promote the limited forms of competition that exist under the existing legal structure

1 Competition in Market Entry for the Supply of New Generating Capacity

Competition in market entry for the supply of new generating capacity can be accomplished one of three ways under the current legal framework The first approach is through competitive bidding for the supply of new or refurbished capacity through the Establishment Plan process required by Section 4 of the Electricity Act On July 11, 1997, the Ministry of Industry, Trade and Tourism (MOITT) approved guidelines for new capacity tendering The tender guidelines and requests for proposal (RFP) have not

been made available Thus, it is not clear whether the process under consideration is transparent and independent [8]

A second area in which HEO can promote competition in market entry for new capacity is through aggressive promotion of direct supply licenses pursuant to Section 21(3) of the Electricity Act Heretofore, supply licenses have been issued on a case-specific basis Generators seeking direct supply licenses are provided little guidance other than the recognition of HEO's authority in section 4 of the supply company operating license To promote direct supply generation, HEO could issue guidelines specifying the procedures and criteria a generator must meet to receive a direct supply license [9]

Renewable energy and cogeneration is the third area in which HEO can promote competition in entry for new generating capacity Section 43(4) of the Electricity Act imposes a mandatory purchase obligation of energy generated from renewable sources and other power plants "as defined by legal rules" subject to a 0 1 MW minimum transfer capability and reception price established by HEO Rather than rely on a case-specific approach to authorizing such generation, HEO could issue guidelines specifying the procedures and criteria a generator must meet to be eligible for mandatory purchase of its output Presumably the reception price should not exceed the lowest price alternative of the supply company HEO could determine this price administratively or through competitive bidding

2 Wholesale and Transmission Price Unbundling

Unbundling wholesale rates and transmission rates into their component parts is fundamental to competition It permits the separation of services whose price can be determined by competitive market forces from monopoly services whose price should be determined administratively Although, the current legal structure does not require unbundled pricing, HEO is not constrained from recommending the unbundling of MVM's wholesale rate be unbundled into its component parts (i e , power supply, wire service and ancillary services) Section 55(3) of the Electricity Act delegates authority to HEO to recommend rules for pricing to the MOITT It does not prescribe a specific methodology Section 7 of MVM's license permits it to allow a third party to perform ancillary services and Article 8 requires that MVM maintain a transparent accounting system such that the costs of transmission and ancillary activities are functionally separated [10] Thus, it appears that HEO has the authority to require MVM to unbundle its rates under the existing legal framework There are a number of advantages to HEO taking this action now including

- Establishing the accounting and billing structure to conform to the requirements of transparent pricing with a competitive market consistent with the EU Directive,

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[8] For example, in the context of the Directive, Article 6(5) requires that the authority responsible for conducting the tender process be independent of the generation, transmission and distribution segments of the industry If the tender process places MVM in control of the process, the independence requirement will not be met

[9] Promotion of direct supply licenses may cause a supply company to incur stranded costs when it loses a customer to a direct supply licensee There is no explicit statutory provision that precludes or allows stranded costs to be recovered from the departing customer In the absence of any statutory authority, HEO could deny recovery of stranded costs Alternatively it could require that the supply company be compensated as a condition of the direct supply license or recommend an adjustment to the pricing formula to permit payment of an exit fee by customer taking direct supply service in lieu of service from its existing customers

[10] For purposes of this paper ancillary services are deemed to include frequency control losses voltage regulation, load following scheduling and dispatching This based on a broad interpretation of the term as it is defined in the English version of MVM's license

- Eliminating any cross-subsidies in MVM's wholesale price For example, unbundling would eliminate any cross-subsidies that may exist between the price paid by customers purchasing transit service through Hungary and the bundled wholesale price charged to the supply companies,

- Unbundling would allow for transparency of transmission-related generation services purchased from the generators by MVM including frequency control, losses, reactive power, and load following This would lay the groundwork for pricing these services on a competitive basis in a more competitive market structure in the future

- Because MVM continues to own capacity and operates a both a domestic and export merchant function (i e , the CA) it will be necessary to ensure there is independence between the TSO and the merchant business This will prevent the CA from having an unfair competitive advantage in terms of market information and access to the network Section 20 of the Electricity Act allows HEO to impose license conditions defined in legal rules A code of conduct imposing a separation of function between personnel involved in system operations versus the merchant business and the dissemination of market sensitive-data could be adopted by resolution and incorporated by reference into an amendment to MVM's license

3 Promotion of Exports by Supply Companies

Section 4(d) of the Electricity Act grants the Minister of Industry and Trade (MOIT) the authority to regulate imports and export of electricity Neither the Electricity Act, nor Decree 29/1995 precludes the supply companies from entering the export market in order to market any underutilized capacity they are purchasing from MVM [11] In order for a competitive export market to develop, a number of reforms would have to occur [12]

- Because MVM is not legally obligated to provide non-discriminatory access and transit service, export transactions originated by the supply companies would have to be effectuated through a buy sell transaction A supply company and an export customer would negotiate a purchase price and the CA would engage in a purchase resale transaction to deliver the power and energy In order for this system to function, MVM's rates must be unbundled in order that the true and effective cost of transmission service is revealed to the buyer and seller [13]

- The supply companies should be provided real-time access to export-related market data currently known only to MVM in order to identify trading opportunities and the availability of transmission capacity to effectuate trades The data should be equivalent to the data made available by the TSO to the CA It should also be made available contemporaneously to all market participants including the CA HEO should be able to require MVM to make such information available on a real-time

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[11] Decree 29/1995 in Section 4(3) specifically authorizes exports at 35kV or less by supply companies to customers not connected to foreign distribution networks

[12] Section 6 of the supply company license permits a supply company to engage in import/export activities to the extent it is consistent with the Ministerial Decree (i e , Decree 29/1995) issued in accordance with Section 4(d) of the Electricity Act

[13] Based on the English translation of Decree 29/1995 that the use of the term supplier" refers to the supply companies and MVM To the extent it is intended to include generators as well the buy sell transaction described could be implemented to allow generators to participate in the export market

basis as a condition of and pursuant to, Section 16 Duty to Supply Information of MVM's operating license

4 Retail Unbundling

The legal support for retail unbundling under the Electricity Act would be the same as that used to support wholesales unbundling There is no explicit provision in the act that precludes HEO from recommending to the MOITT that retail prices be stated on an unbundled basis Section 8 of the supply company license permits it to allow a third party to perform ancillary services and Article 9 requires that the supply company maintain a transparent accounting system including the separation of the cost of supply, ancillary and secondary services Thus, it appears that HEO has the authority to require the supply companies to unbundle their rates under the existing legal framework There are a number of advantages to HEO taking this action now including

- Establishing the accounting and billing structure to conform to the requirements of transparent pricing with a competitive market consistent with the Directive,
- Eliminating any cross-subsidies between customer classes
- Provide an unbundled price for wires service that could be used to ensure that supply companies are adequately compensated by MVM for the use of their network facilities associated with generators dispatched by MVM that are interconnected to a supply company and for loop flow on supply company subtransmission facilities [14]
- Promote competition by third parties to carry out ancillary or secondary services such as meter reading, billings and collections and other customer service functions that can be accounted for and priced separately from basic wire service

C Model #1 Minimum Change Model

Model #1 is intended to meet the minimum requirements of the Directive (See Figure 5) It would accomplish this via

- Direct access for the largest end users to generators on the time scale of Hungary's admission to the EU (earlier if required in the admission process)
- Access for end users to generation on a negotiated access basis The "negotiated" tariff structure would have to address the pricing of transmission and, probably, the recovery of stranded costs that these end users would otherwise have to pay
- Separate accounting for generation, transmission, and distribution activities in entities like MVM that retain control over more than one of these functions
- Separation of MVM's organization and processes for energy contract administration and the transmission scheduling activities

[14] Based on the definition of transmission in contained in the MVM's operating license, it appears that the supply companies may already have the ability to establish wire service rates in order to receive compensation from MVM Specifically the license defines the term transmission to "include the use of assets of a supplier where necessary, on terms defined in the Operational Code and contracts governing such use,"

- Establish and publish specific regulatory criteria and processes for the authorization of new generation facilities, including self-generation plants This would also include the formalization of the tendering process for new supply for the distributors

The basic version of Model #1 is a creation of a single buyer in MVM with responsibility to carry out buy/sell transactions on behalf of the distributors, generators, and the largest end users These transactions would be negotiated directly between the parties, but all scheduling and financial dealings would be centralized in the "CA" function of MVM An enhanced version of Model #1 (referred to as Model #1+ in Figure 2, with enhanced transactions shown as dashed lines on Figure 5) has the CA only performing scheduling of the operation of contracts on a physical and economic basis, with no financial flows going through the CA

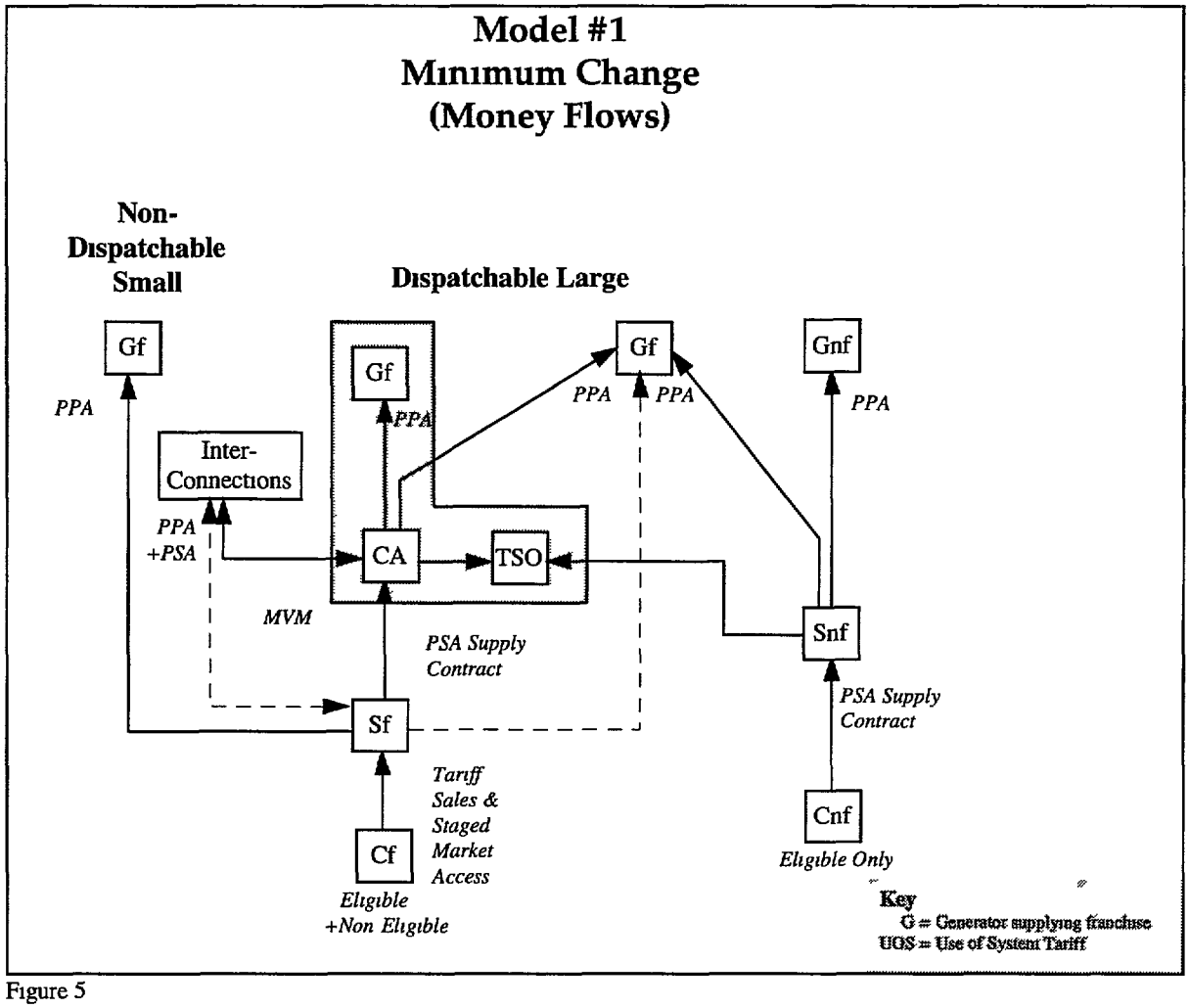

Figure 5

D Model #2 Pool Model

Model # 2 (See Figure 6) is the first of two models that go beyond the minimum requirements of the Directive Both Model #2 and Model #3 are designed to create more competitive markets within the region The key structural characteristics of Model #2 include

- Access to the transmission system and a comprehensive pool for generators, distributors, and end users Pool settles cash market transactions on transparent, open pricing
- Intermediaries allowed to market power to wholesale and retail customers and to create a more liquid cash and financial market in electricity
- Access by end users on the schedule specified in the Directive Intermediaries may begin activities with creation of pool
- Separate accounting or even divestiture for generation, transmission, and distribution activities in entities like MVM that retain control over more than one of these functions
- Given the open pool, the development of new generation would have to be via an authorization process rather than tendering process for new capacity Is a tendering process required for distributors if capacity authorization occurs at national level, outside immediate control of distributors?

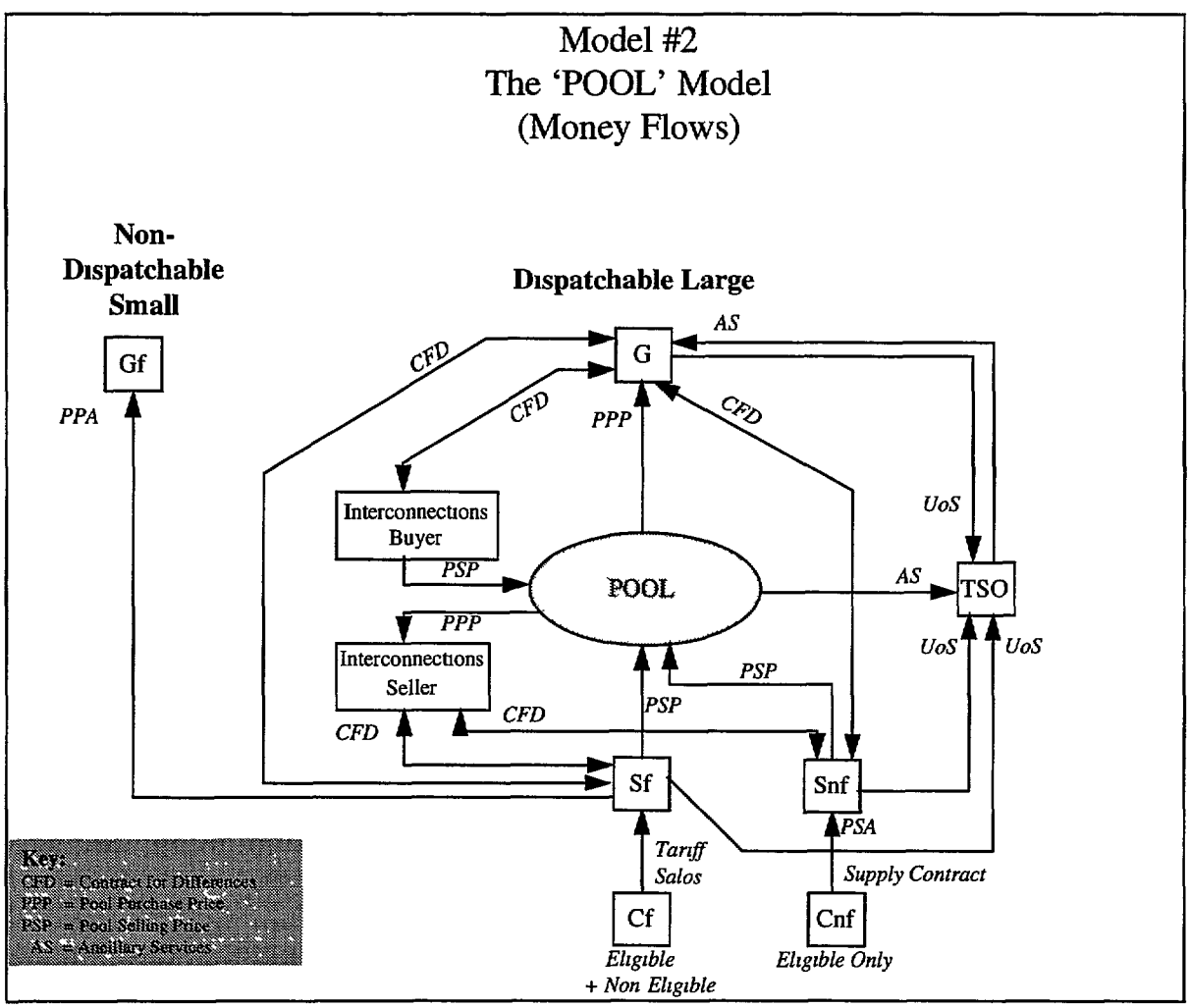

Figure 6

E Model #3 Bilateral Trading Model

Model #3 (See Figure 7) all exceeds the requirements of the Directive It establishes comprehensive cash and forward markets in power This model does not require the formation of a pool to handle pricing and settlements, but it would require a comprehensive ISO or "segregated" transmission access coordinator The key elements of Model #3 are

- Distributors and end-users may contract for supply directly with generators and power marketing/ supply intermediaries on the EU schedule Existing generation contracts and distributor purchase contracts would wind-out on a schedule that is coordinated with end-user direct access and stranded cost recovery fees placed upon the transmission/ distribution system
- Hungarian generators may export, others may import into Hungary, with an import authorization process for long-term contracts (over 1 year), with a blanket authorization possible for shorter-term contracts
- Access by end users on the schedule specified in EU plans Intermediaries may begin activities with initiation of negotiated, but transparent, transmission access
- New capacity permitted via an authorization process rather than authorization / tendering process since end-users and distributors are capacity buyers via bilateral transactions
- Separate accounting or even divestiture for generation, transmission, and distribution activities in entities like MVM that retain control over more than one of these functions
- Transmission System Operator (TSO) or segregated Independent System Operator (ISO) developed for scheduling open access transmission transactions This TSO or ISO only schedules, and does not handle financial settlement of the transactions
- Contracts (quantities and revenue) are reported, but perhaps on a delayed basis (daily or weekly for short term transactions, contracts on a quarterly or annual basis)

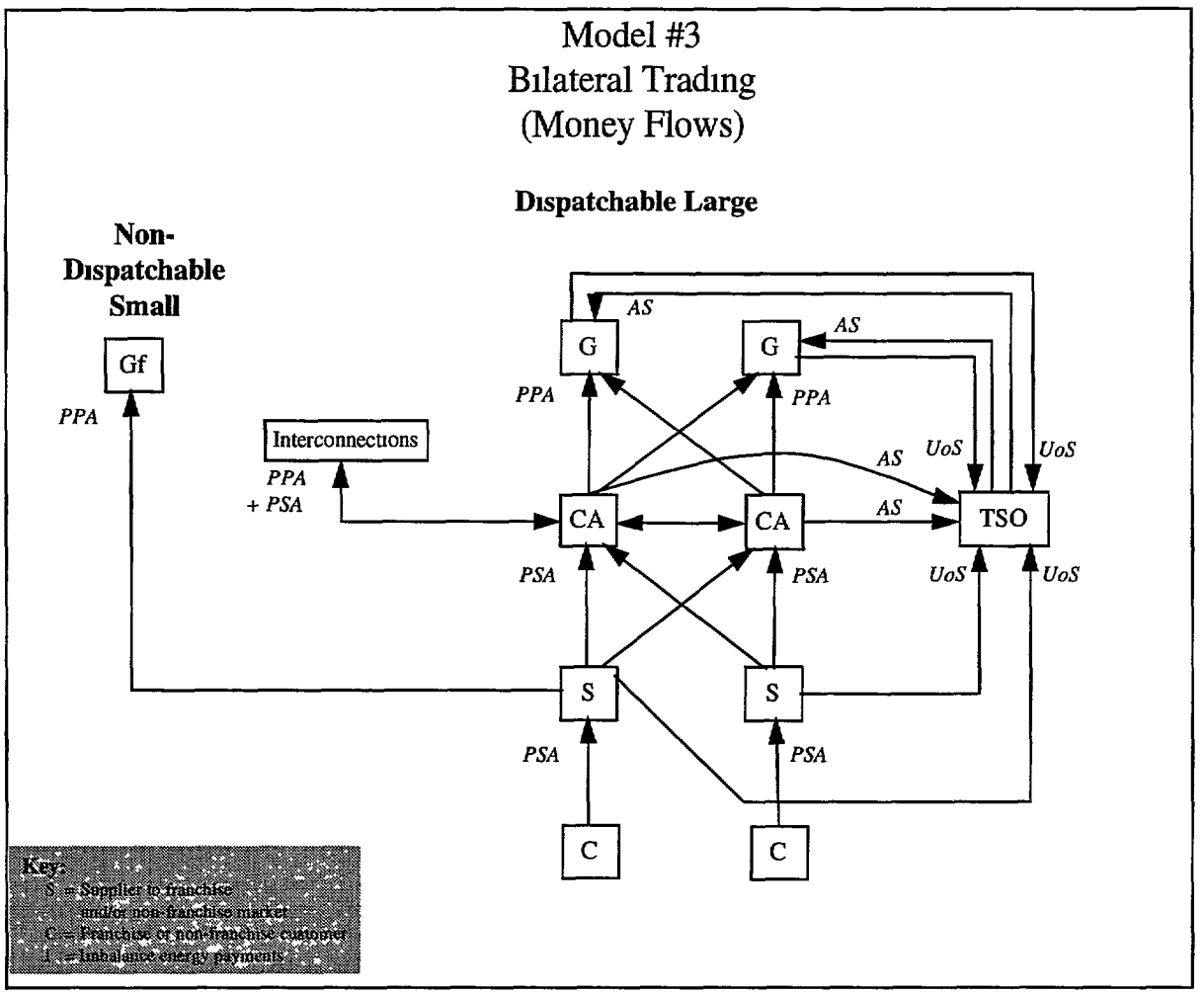

Figure 7

F Summary of Models

Figure 8 below summarizes and compares these models to the current Hungarian market structure

	GENERATION	WHOLESALE TRADING	TRANSMISSION	RETAIL SUPPLY
Hungary Now	Numerous but some key generation held by MVM	Single buyer selling only to distributors with limited exceptions	Single system integrated with single wholesale energy buyer/seller	None except limited exceptions
Model # 0: Enhanced Status Quo	Numerous with defined separate business units for generation held by MVM	Formalize and make transparent process for energy contracting and authorization/ tendering for new capacity including authorization for self-generation	Single system but separate business units for energy contracting (CA) transmission scheduling (TSO) and operations unbundled transmission rates	None except limited exceptions with case by case consideration of additional exceptions unbundling of rates

Model #1 Minimum Change	Numerous with defined separate business units for generation held by MVM	Formalize and make transparent process for energy contracting and authorization/ tendering for new capacity including authorization for self-generation	Single system but separate business units for energy contracting (CA) transmission scheduling (TSO) and operations unbundled transmission rates clearly isolated transmission operator	Direct access by EU schedule via single buyer transactions unbundling of rates this Model could allow limited energy transactions on a bilateral basis
Model #2 Pool-based Market	Numerous, with defined separate business units for generation held by MVM	Pool pricing for energy and capacity payments intermediaries allowed transparent authorization process for new capacity	Single system but separate business units for energy contracting transmission scheduling and operations unbundled transmission rates isolated transmission operator but integrated with pool pricing function	Direct access by EU schedule unbundling of rates marketing intermediaries allowed open tendering process for distributors until direct access reaches lowest level customers
Model 3: Bilateral Trading	Numerous with defined separate business units for generation held by MVM	Bilateral market pricing for energy and capacity payments intermediaries allowed transparent authorization process for new capacity	Single system but separate business units for energy contracting transmission scheduling and operations unbundled transmission rates clearly isolated transmission operator with ability to market price transmission in regulated limits	Direct access by EU schedule unbundling of rates marketing intermediaries allowed open tendering process for distributors until direct access reaches lowest level customers

Figure 8

V. Pros, Cons, and Special Issues for Trading Scheme Alternatives

This section review the potential models from, first, a general perspective in terms of market efficiency and EU conformance, and then from the perspective of key parties generators, transmitters, distributors, large business users, small business users, and households

A Potential Interest Groups and Objectives

Evaluation of these models requires balancing several objectives from competing interest groups

- A more competitive electric industry is likely to be more efficient and transparent -- encouraging balanced economic development via appropriate price signals to users and providers of electricity It also fundamentally supports economic development by helping Hungary meet one of the

requirements for entry into the EU These market efficiency and economic development objectives, in the long-run, should be valued by all market participants

- Such changes will likely require shifts in the economic interests for MVM, generators, and suppliers -- any transition must address the commitments made in the electric industry privatization efforts to date, or future privatization and commercial development efforts may be jeopardized Thus, the existing players who may be disadvantaged in the move to new trading schemes must be given some stranded cost or transition payments or equivalent benefit to match potential risks in the change
- Labor interests within the existing industry will be disadvantaged in the short-term by this transition, but this must be balanced against the intermediate and long-term gains from the industrial and economic development and the risks from failing to make the necessary market changes

B Status Quo

Preservation of the status quo is not an alternative given Hungary's commitment to join the EU Hungary filed it application for membership on 31 March 1994 It has also executed a European Agreement, committing itself to a transition period of a maximum duration of 10 years At the end of which it will have presumably fulfilled the membership requirements Under Article 62(2) of the European Agreement, Hungary as committed to abide by the rules on competition contained in Articles 85, 86 and 92 of the Treaty of Rome[15]

C Model #0 Enhanced Status Quo

This Model provides incremental steps toward EU liberalizations prior to acceptance as a member It provides for aggressive promotion of a competitive market for the supply of new generating capacity, but does not meet the minimum requirements of the Directive It initiates some competition in the wholesale market via export sales by the supply companies and in the retail market by the promotion of additional direct supply licenses, but these gains will be very limited

D Model #1 Minimum Change

The Minimum Change Model establishes a model that

1 Can be easily controlled and regulated centrally

2 Can be arbitraged by major generators, users, and adjoining systems, but only to a limited degree because of limited direct access by only largest end-users and the single buyer and TSO

3 Is potentially slow to adapt to market changes because time required for rules and legislation changes This becomes more of a problem as adjoining markets, especially larger markets, become more competitive -- like market influences from the Polish pool and overall Central European pool

4 Is the least incremental change in institutions and legal structure

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[15] I was concluded in the paper ' Potential Conflicts Between Existing Hungarian Law and the European Union Directive on Liberalization of the Electricity Sector," March 28, 1997 that certain aspects of existing law would be deemed anti-competitive under the Treaty of Rome rules on competition

E Model #2 Pool Model

The development of a complete pool based market

1 Can be easily controlled and regulated centrally, but requires major institutional changes combined with the development of a complete wholesale trading system followed by a retail access system on a centralized basis

2 Can be arbitraged by major generators, users, and like adjoining systems, especially larger pools or independent marketers or supply users (distributors or end users)

3 Is potentially slow to adapt to market changes because time required for rules and legislation changes This becomes more of a problem as adjoining markets, especially larger markets, become more competitive -- like market influences from the Polish pool and overall Central European pool

4 The publicly available pricing information, on a broadly publicized basis, would likely encourage the development of greater competition and a desire for access to the pool at smaller customer levels

F Model #3 Negotiated or Open Access Market with Many Competitors

The bilateral approach to the market offers a model

1 This model has the least centralized control

2 It can evolve from Model #1 on an incremental basis without the "big bang" associated with the development of a centralized pool (Model #2)

3 Competitive market for new products in addition to pricing commodities in a fixed framework can result in new services by distributors, generators, and power marketers/ suppliers

4 Difficult to arbitrage, adapts to changed conditions quickly, especially at the wholesale level -- this could allow Hungarian market participants opportunities to take advantage of market conditions in adjoining pools

5 The publicly available pricing information, on a broadly publicized basis, would likely encourage the development of greater competition and a desire for access to the pool at smaller customer levels

VI. Conclusions

The Hungarian government and regulator should begin an evolutionary process to move the Hungarian electricity market beyond the current structure The current Hungarian electric industry market structure is unacceptable for three reasons it is a monopoly structure with competitive entry only for new generators, current price regulation with bundled pricing is inefficient and not transparent to

customers and potential market entrants, and the current legal and market structure is not consistent with the requirements of the EU Directive

This evolution is expected to require balancing several objectives from competing interest groups A more competitive electric industry is likely to be more efficient and transparent -- encouraging balanced economic development via appropriate price signals to users and providers of electricity It also fundamentally supports economic development by helping Hungary meet one of the requirements for entry into the EU Such changes will likely require shifts in the economic interests for MVM, generators, and suppliers -- any transition must address the commitments made in the electric industry privatization efforts to date, or future privatization and commercial development efforts may be jeopardized Thus, the existing players who may be disadvantaged in the move to new trading schemes must be given some stranded cost or transition payments or equivalent benefit to match potential risks in the change Labor interests within the existing industry will be disadvantaged in the short-term by this transition, but this must be balanced against the intermediate and long-term gains from the industrial and economic development and the risks from failing to make the necessary market changes

- A three stage approach is recommended for moving from the current structure to a more acceptable structure First, the regulator should take all the steps needed within the current legal framework to move toward a market that is more competitive in generation, unbundled in pricing at the wholesale and retail level, and promotes exports by a greater breadth of market participation This is discussed above as Model #0 Aggressive implementation of greater competition in generation via competitive bidding, direct supply licenses, and renewable energy and cogeneration will create some limited increase in generation competition Unbundling at the wholesale and retail level improves market transparency The promotion of exports by the supply companies will improve efficiency, create market competition even beyond Hungary's borders, and improve market transparency The supply company exports would be conducted on a buy/sell basis transacted through MVM, but arranged by the supply companies Since these steps are under existing law for the original privatization efforts, no transition cost treatments should be required

- Second, the regulator and the government should initiate the legal changes to move toward an enhanced Model #1 structure This would require the first stages of open access transmission for distributors, generators, and, via a phased process, the largest end users This initial trading can be implemented via a buy/sell Single Buyer approach through MVM, but an "enhanced" approach would have MVM act solely as transmission system operator with a segregated contract administrator responsible for existing contracts for generation and supply along with ancillary services Other participants in this enhanced Model #1 would transact contracts directly between buyer and seller, but schedule energy through MVM in this limited market This trading should focus on short-term and long-term energy, not ancillary services except on a case by case basis Export activities and transmission unbundling should be encouraged to allow Hungarian and adjoining markets to work together Market transparency should be encouraged by public reporting of completed transactions within a short period (within a month) after formal agreement is reached, to support this, actual energy purchases and sales together with associated revenues and costs should be reported quarterly for regulated market participants (MVM, supply companies, and generators) Third party intermediaries should be licensed and allowed to develop as "power marketers," who are also required to report transactions involving the Hungarian market This stage should also address the transition process for existing generation and supply contracts and potential stranded costs (stranded costs could be treated as a charge on distribution wires and, on a limited basis limited by market conditions, for transmission across Hungary, but this is covered in

detail in a companion paper) The first stage will create tensions between market participants that should be balanced between open access and transition payments

- Third, as the transition proceeds, under a legal and regulatory framework and schedule established in the move to the enhanced Model #1, the market structure should move to Model #3 As open access is extended to the smaller industrial customers, this structure avoids problems with the pool structure that might develop because of the relative size of the Hungarian market versus nearby markets or pools It also allows the Hungarian market players to participate in market opportunities for energy and ancillary services that might exist in the nearby markets and pools This Model #3 goes beyond the EU Directive requirements, creating a competitive market that may attract industry and new regional generation development

How fast should the transition process move? First step to Model #0 should begin as soon as possible Electricity markets worldwide are moving toward increased competitive trading of energy via a variety of models, but the trend is clear market-based regulation of electricity is more efficient than the traditional command and control cost-based approach Second, in coordination with Hungary's move toward EU participation and the needs to keep Hungarian industry competitive, the government and regulator should move quickly toward the enhanced Model #1 as a path to Model #3, initiating the operations of Model #1 in coordination with the first stage of EU large customer access in the 1999 time frame This ensures that the electricity sector does not impede Hungary's participation in the EU and places the Hungarian electricity sector in a competitive position versus nearby wholesale markets and moves the retail industrial rates toward a more competitive structure to attract industrial development

Appendix: Conceptual Overview on Trading Systems

A Overview

This appendix examines the development of electricity trading structures from a conceptual perspective Although the discussion can become abstract on the types of products and services to be traded, the issues can be reduced to a small number of basic policy choices The fundamental questions focus on the costs, benefits, and practicality of introducing competition in the key stages of the market, given the size and economic characteristics of the Hungarian electricity industry The relatively small size of the Hungarian market combined with the potential for tight transmission interconnection with adjoining countries, and thus very strongly correlated wholesale electricity market conditions, make issues of transmission and energy and ancillary service imports very important for Hungary

B Creating Types of Products For Power Marketing and Trading Business

Any electricity trading system must continually ask the question, "How should electricity services be sold to various customer segments?" Setting public policy in a establishing a trading system involves anticipating how players in the market might discover and serve market needs using available (and anticipated new) technology on a market segment and a product basis, given the skills of the existing and potential new organizations Thus, in examining the development of electricity trading schemes in various countries and in various conditions, it is important to explore the different classes of products that might be created to serve electricity needs in the different environments

Any approach to creating new market mechanisms for trading electricity competitively should start with an examination of the customer values that might emerge in a market and balance these with the physical, financial, and business functions needed to operate in the power industry This involves addressing the often-identified customer values of reliability of supply, pricing, and convenience

Based on experience in other market unbundlings, as the restructuring evolves, retail industrial and large commercial customer preferences will increasingly drive the process Figure A-1 illustrates the typical large customer preferences reliability is important but little difference is perceived between suppliers as the market matures The key buying factor is price in the differentiation of suppliers Service is only a "tie breaker" between otherwise equivalent suppliers

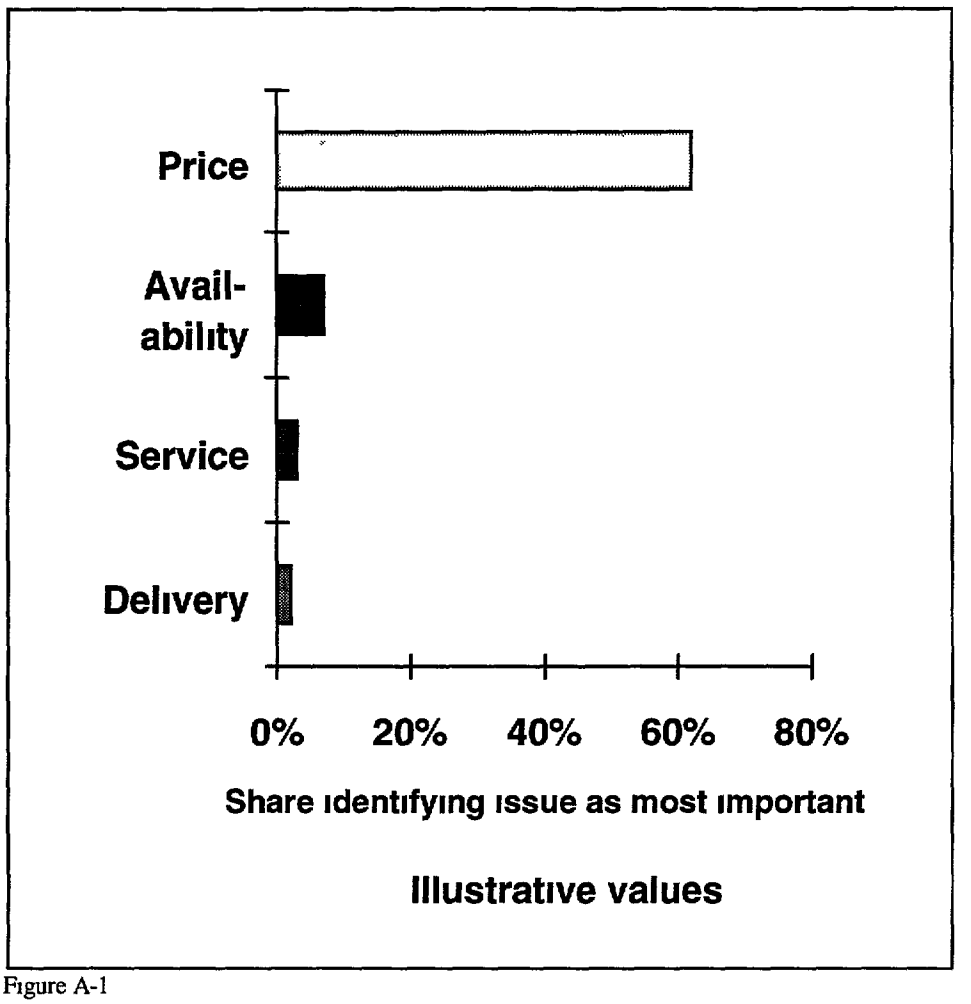


Figure A-1

The chart in Figure A-1, illustrates market research results that have been observed repetitively in the gas unbundling in the U S , the electricity unbundling in E&W, and other utility product unbundlings

The confusion of the restructuring for traditional players, combined with the adaptability of new entrants in power marketing, typically results in a substantial market share loss for the traditional utilities Any trading scheme must anticipate the market results of the change -- such as the loss of previously bundled businesses to competitive market players

The functions that are needed to serve these customer values can be classified into three categories

- Physical Power Management This includes the arrangements for supplies, generation and transmission operations, new plant and transmission capacity development, and overall transmission and generation and system management
- Financial Risk Management This involves the control of future price risk and credit risk through long-term and short-term contracts, both in the cash forward and financial futures' markets These contracts may involve imbedded options
- Customer Service Customer service involves assisting customers in simplifying power purchases and the management of power costs This involves new product and service development, customer data management, customer energy use management, supporting information systems, and overall cost management assistance

To develop these functions, it is helpful to examine approaches to the pricing, products, placement, and promotion of these products in the unbundling of the electricity business

To examine this range of products that might be developed in a trading scheme, as in a single buyer, a pool, or in a bilateral market, it is useful to look at the potential products in several dimensions

- Functional (What is traded?) The value chain and opportunities created in the unbundling of traditional functions
- Time (When does trading occur? What period is covered?) The timeline for the power business from investment to ancillary services
- Location (Where is trading point?) Geography of the power business and the trading of power at local and remote locations with a mix of power generation and transmission use and interruption options
- System and Pool Structure (Who trades? How does process work?) The existing and potential future transaction system for electricity

The traditional electric utility industry was based on physical production and delivery principals The major stages of the business involved a series of engineering stages fuel supply, generation, transmission, and distribution Finally, the costs were counted up by the accountants, and then regulators and the attorneys agreed on the tariffs, and the cost of service was recovered from the customers Figure A-2 illustrates this traditional perspective

The electric utility industry is now being transformed into a competitive market by the creation of a series of unbundled submarkets The market is creating a series of paper markets on top of the underlying physical facilities This is being created as an overlay on top of the traditional utility value chain as illustrated in Figure A-3

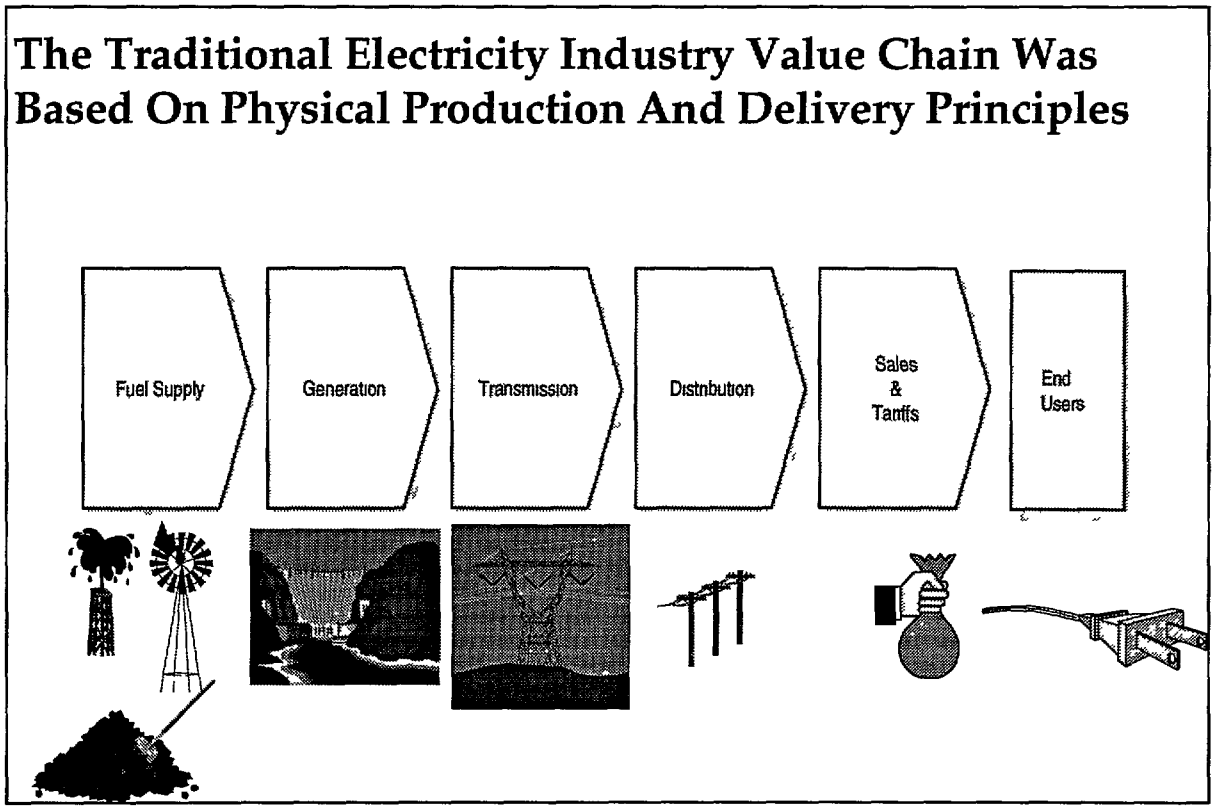


Figure A-2

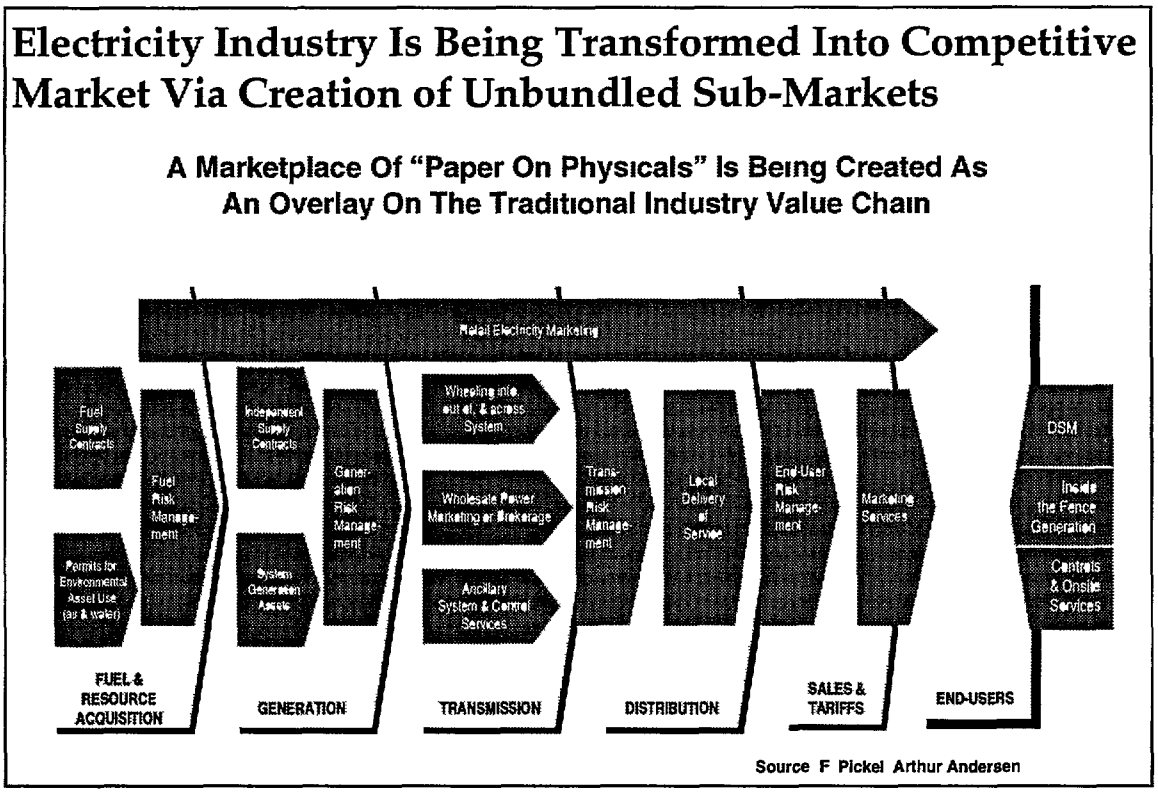


Figure A-3

Figure A-3 illustrates the series of virtual or paper markets that have been created on top of the engineering systems of the electric utility industry For example, in the fuel sector, fuel supply contracts and fuel price risk management are active markets in the oil and gas fuel sector In some areas, coal is beginning to become a more competitive business with some limited price risk management markets as well

In generation, independent power projects have become the key new source for electricity generation supply in most markets Generation price risk management has developed as a paper market in the U S and in England & Wales market (E&W)

In the transmission sector, wheeling services have developed in some markets, sometimes through pools and sometimes through independent bilateral transactions The wholesale power marketing or brokerage business is the key growth area for power marketing activities overall in the U S and many other markets now Ancillary and system control services, such as spinning reserve and reactive power for local voltage support ("VAR support"), are provided by the pool in some markets However, there has been competitive development of ancillary services to a limited degree in both the U S and in the E&W pool While transmission price risk management will be very important, given the interregional volatility of electricity prices, a formal transmission price risk management market has not developed in either E&W or the U S at this time

Local delivery of service is expected by many to remain a regulated monopoly for an extended period This is the "wires" or distribution access aspect of the supply or distribution business

A key paper function in the new market is end-user price risk management -- other risk management services typically exist only for balancing market positions It is the end users who are one of the key drivers for customized risk management Given the complexity of all the transactions up to this point, the end users will require marketing services to administer all these transactions This may be provided separately, as shown on this chart Or the whole market may be rebundled by retail electricity marketers providing new integrated services all the way down the value chain, creating broad competition with their own services or using the traditional players as subcontractors for their efforts

Finally, inside the customers' fence, demand-side management will still play a role, although some of the recent demand-side management programs may be abandoned as uneconomic However, new demand-side management programs, taking advantage of market pricing and risk management, will be developed In some cases, "inside-the-fence" or on-site generation may be abandoned, in other cases, it may enhanced given the volatility of the electricity prices and the opportunities for customers to reduce costs Given the complexity of this new market, on-site controls and services will be increasingly important to assist customers in managing the information and controlling or automating their own operating choices relative to market conditions

The market unbundling illustrated in Figure A-3 shows the market on a unbundled functional basis Fundamental in Figure A-3 are questions of access to market for various components and the allowed trading relationships

Figure A-4 provides an alternative view of the market, looking at the electricity business on a timeline rather than on the industry value chain

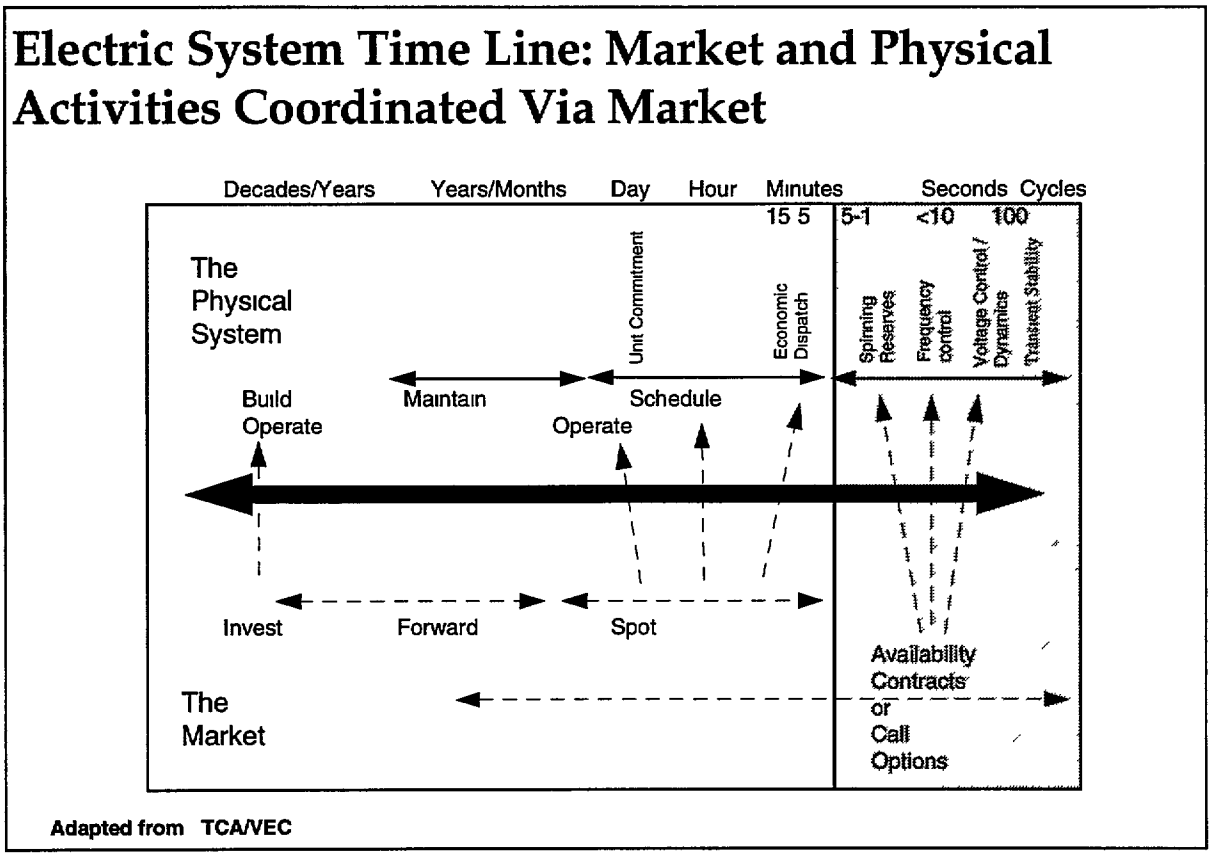


Figure A-4

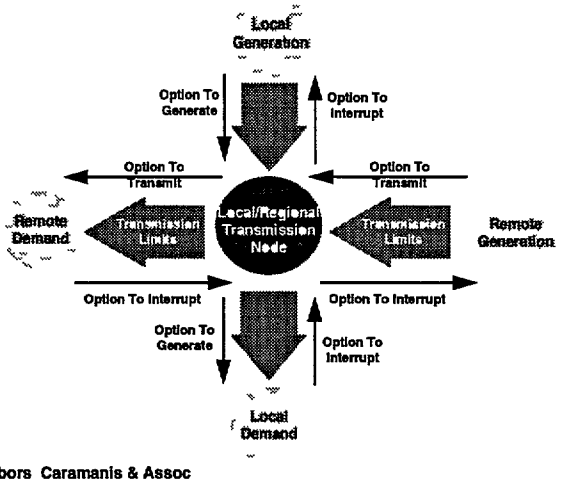
This timeline helps illustrate the time range of potential products or services that might be built for customers For example, as shown along the top of the timeline, the physical system has been built on a decade scale, with operation and maintenance spread over a period of years to months Scheduling has been done from a day to a 1 to 15 minute basis for maintenance scheduling, unit commitment, and economic dispatch For time periods roughly under five minutes, the system has largely operated on automatic controls, adjusting the use of spinning reserve and other resources to meet very short-term engineering requirements

As the market unbundles functionally, it may be helpful to look at the timeline differently, as illustrated across the bottom of the timeline Investment, for example, in independent generation projects is done over the decades to years period Forward markets in many electricity market environments now offer contracts for the forward period from decades down to months, and the spot market offers opportunities for the purchase and sale of power from the month down to the minute time scale Option contracts can provide the opportunity for firm supply, without the requirement to take the energy, from a time period from years down to minutes It may even be possible to offer the short-term system control services via option-like contracts

A third way of looking at the opportunities for creating new products in power marketing is to look at electricity business on a geographic scale As shown in Figure A-5, a very simplified view of the electricity business involves taking both local and remote generation through the local transmission node to serve both local electricity demand and remote demand The remote supply and the remote demand require the use of transmission Each one of the generation activities can occur under a firm contract or can involve option contracts, involving both the option to generate and the option to interrupt The transmission contracts both from remote generation and to remote demand can offer firm contracts or transmission contracts linked to options to transmit or options to interrupt Finally, the local and remote demand can operate on the basis of options to buy with options to interrupt by the supplier This offers a myriad of potential contract permutations and combinations, linking local with adjacent markets

The Core Structure Of Power Marketing Is The Leveraging Of Several Key Options

Power Contracts May Incorporate Some Or All Of These Key Options



Adapted from VEC/Tabors Caramanis & Assoc

Figure A-5

This geographic scale opens the issue of transmission pricing For short-run operating efficiency, especially in a market environment, the theoretically correct approach involves the continuous "spot" pricing of transmission services by node in the transmission system (multiple node short-run marginal cost pricing)-- a practical impossibility Most transmission systems and electricity markets, however, do not require this detailed level of pricing to be relatively efficient Most systems can be simplified in either their time scale (since the given system's relative transmission prices do not vary substantially over time) or in a spatial scale (since the given system's transmission prices do not vary substantially by location of alternative points for energy supply and delivery) Figure A-6 illustrates this simplification Short-run transmission pricing, unfortunately, rarely recovers the long-run average cost of the system (or stranded costs), so two part tariff or Ramsey pricing schemes are required to recover the full cost of the transmission system These can be linked to mechanisms for stranded cost recovery

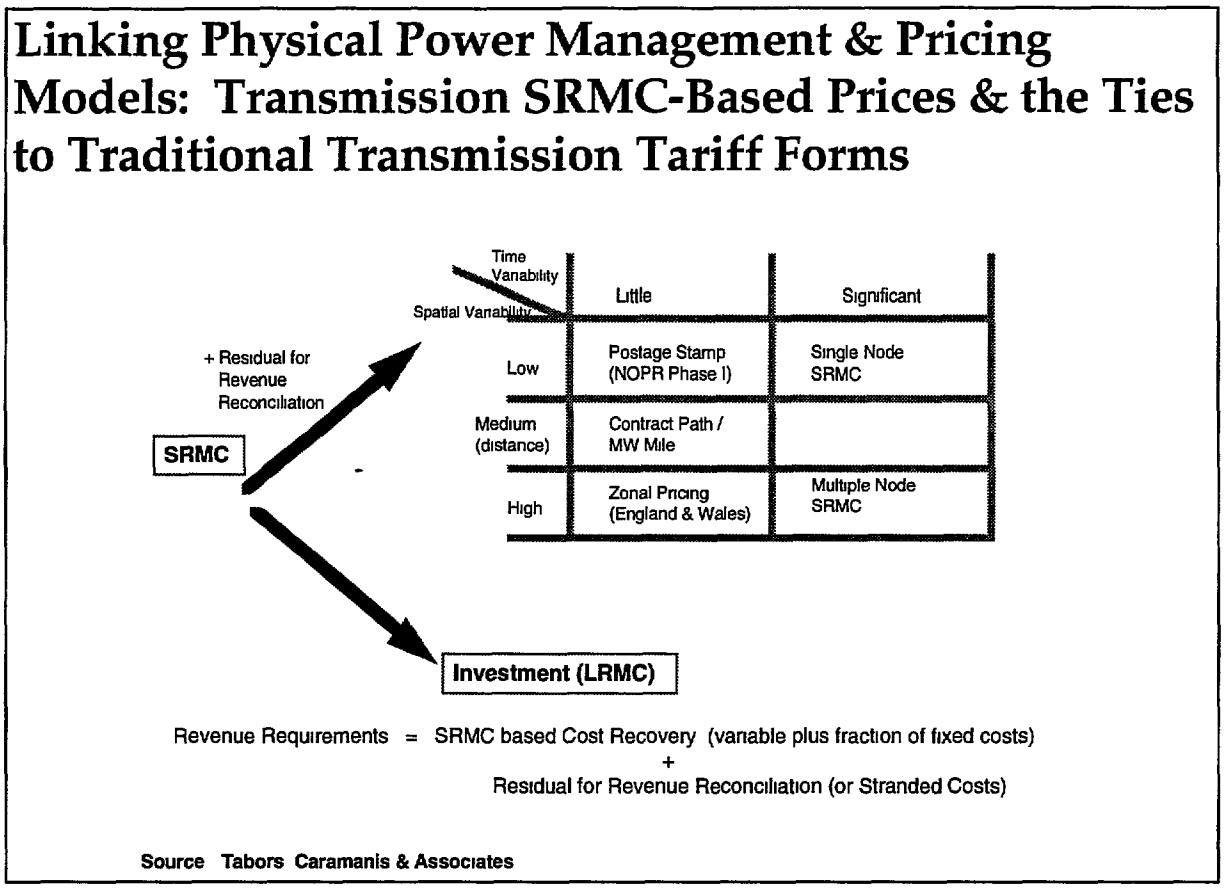


Figure A-6

Each country's approach to restructuring the power industry has offered different opportunities for innovation and financial value in power marketing and trading Generally, in pool based models, the market is tightly defined before the pool is put into operation For example, the various terms associated with what type of energy is bought and sold and what ancillary services are available are defined in the pooling agreements before the pool begins to operate An alternative model, the bilateral model, establishes rules for general transmission transactions, but allows many of the energy products to be redefined by the market players as the market evolves

- The poolco or central exchange model Physical and pricing transactions are scheduled through a "strong independent system operator"
  - ➢ The pools aims for rules defining efficient economic dispatch to the market, with a competitive market starting at the new generation plant investment level
  - ➢ Opportunities are created for major generators for supplying adjoining territories and countries and for on-site generation, selective opportunities usually exist for "gaming" pool rules
  - ➢ Generally, the pool handles both the scheduling of transactions and the settlement of payments between all parties for all services at the wholesale level in the market (all transmission and electric energy and capacity payments)
- The bilateral model Only the physical transaction is scheduled through the weak independent system operator, financial transactions are handled bilaterally between the market participants

(i e , transmission users pay the transporter directly, energy buyers pay the seller/ producer directly)

- This relies on orderly open access to the transmission system, allowing competition to create the economic efficiency in the system from investment down through very short-term dispatch
- Opportunities are created from market arbitrage and by the creation of new products and bundling of products and services across business functions, the industry timeline, and the typology of the electric system

Figure A-7 illustrates a bilateral electricity market Note that the physical flows move from the generators through pools or aggregators through the central transmission system operator to the end users, but the commercial terms and the financial flows are back directly from the customers to the market participants, not to the central system operator This chart shows some ancillary services being provided to the market directly by generators or pools and onward to the customers with coordination through the system operator

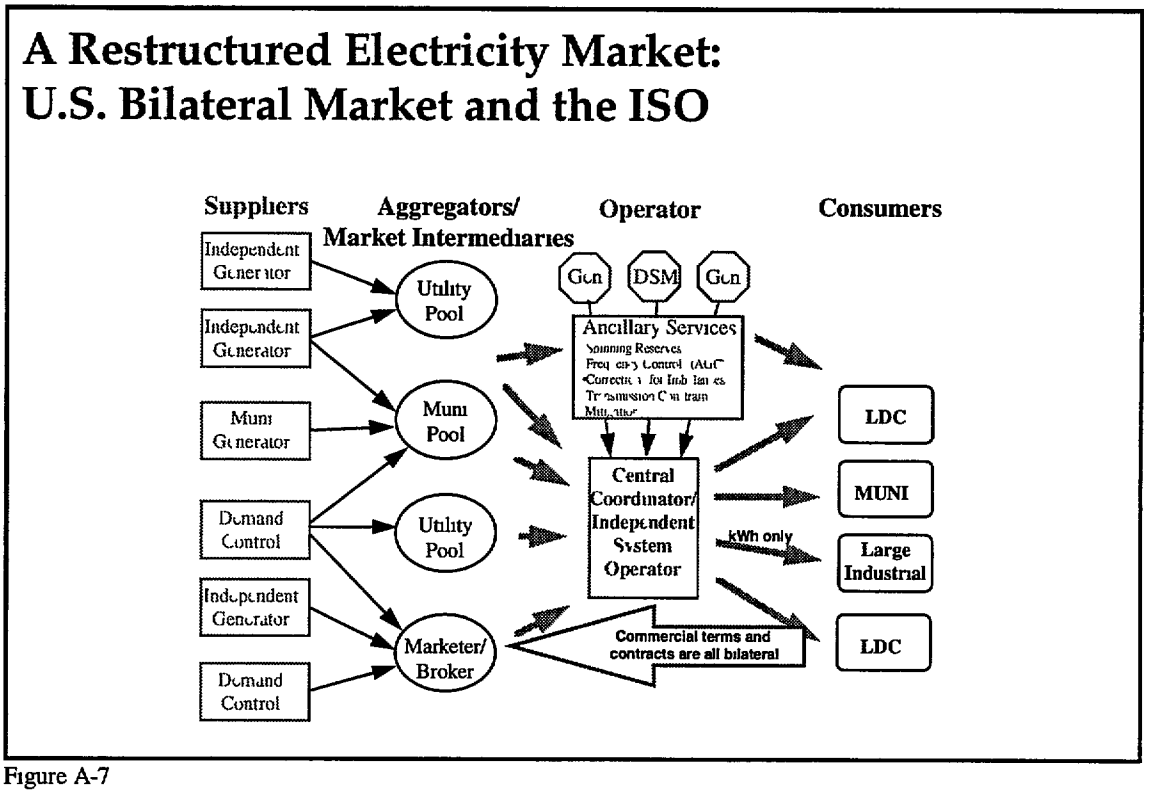


Figure A-7

C *What Comparison Is Appropriate Between Countries?*

This section has provided a conceptual overview of products and services in the power industry in the context of creating systems for trading electricity competitively It has looked at creating new products and services It has also commented on the potential for market loss and the repricing of old products and services and facilities How are these systems developing in various countries?

First, to gauge the scale in examining market differences, Figure A-8 illustrates the relative size of various electricity markets, both as a whole and for specific countries or regions within each area

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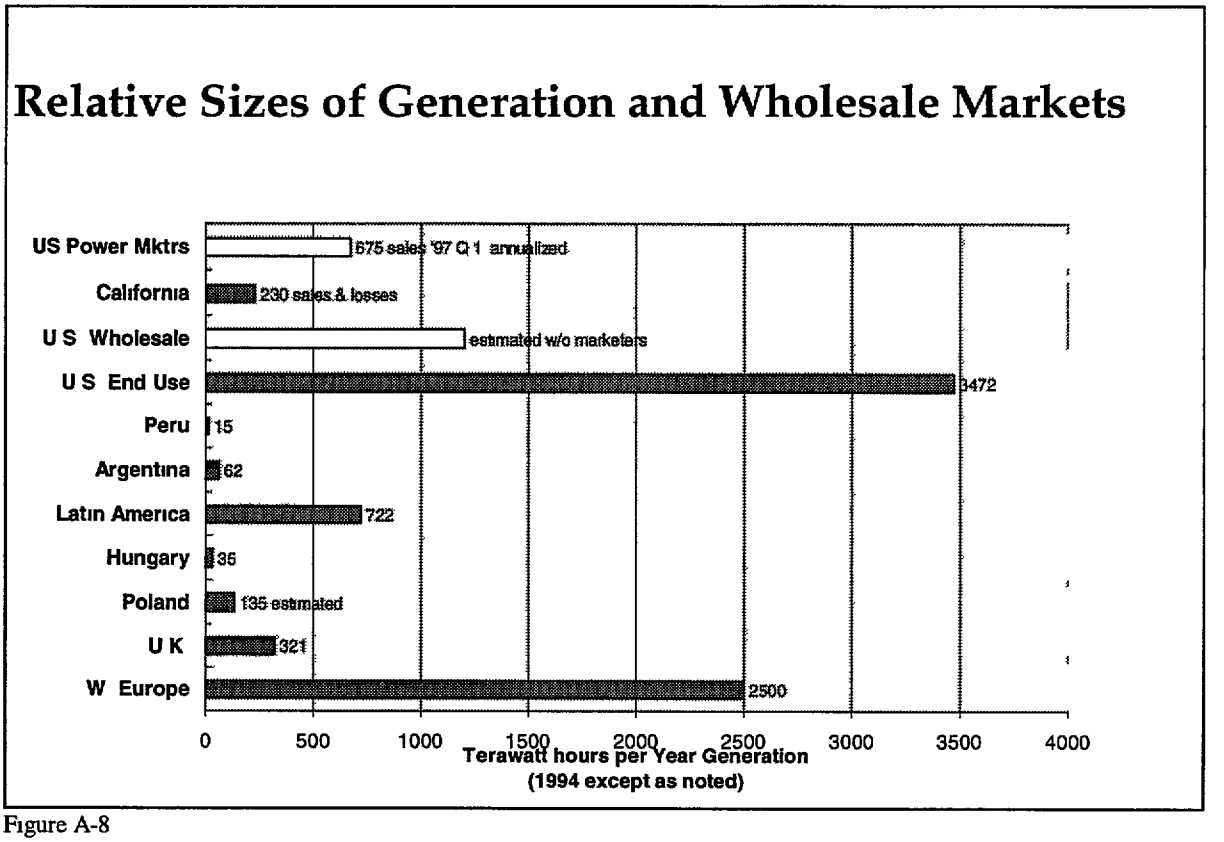

Figure A-8

It's interesting to note, because of the size of the U S market, the wholesale competitively traded volumes by U S power marketers now exceeds the size of the E&W market by over twice However, wholesale power trading in the U S is less than 20% of the total retail end-user market

While wholesale marketing and trading is fairly advanced in all markets, retail electricity marketing is at a beginning stage, except in England & Wales

Figure A-9 is a table comparing the status of physical power management, financial risk management and customer service in various European, North American, and other markets

Comparison of Markets and Stages of Development

Country	Physical Management	Financial Management	Customer Service	Interconnections with Other Markets
North America	Mix of cost-of-service pools & bilateral trading with mixed postage stamp & other transmission pricing methods	Mostly cost of service but IPPs on market contracts and futures market initiated	Basic services planned but offerings are limited, traditional services by distributors	Many inter-connected pools & markets, both electric & gas, strong links to Canada, limited to Mexico
England & Wales	Formal, competitive pool with zonal transmission	Market-based contracts and futures market	Advanced services by marketers	Limited interconnection to France, gas links to North Sea
Argentina	Advanced, market-based pool with time varying, zonal transmission pricing	Contracts and pool spot prices only, no futures	Limited services by generators and distributors only, retail marketing under discussion	Limited to Brazil via shared hydro, potential for greater electric & gas interconnects with all Southern Cone
Hungary	Inter-company transactions on contracts from generators to MVM and MVM to distributors, bundled transmission tariffs	Regulated cost-of-service via contracts	Only by distributor, with limited exceptions	Existing electric links, limited gas, potential for greater gas and electric market integration with neighbors

Figure A-9

TECHNICAL AND OPERATIONAL ISSUES

Bechtel International Consulting Group

HUNGARY COMPETITION STUDY PAPERS

TECHNICAL AND OPERATIONAL ISSUES

1 INTRODUCTION

This paper covers technical and operational issues in the Hungarian ESI as they currently exist and how they may be affected in any restructuring of the Market Trading arrangements The paper concentrates on the issues which affect security, quality and safety of supply including how they are managed now and how they will need to change in any restructuring to introduce more competition into the industry It should be noted that the paper is very general at this stage since the proposals for specific changes to trading arrangements have yet to be defined However, the companion paper on Trading Arrangements describes a number of options for changes to the present Hungarian Model and each of these options will raise technical and operational issues which need consideration before a specific model is chosen This paper therefore addresses the technical and operational issues which may arise with each of the four Models being considered It should, however, be noted that there are a number of statements about the current operational arrangements which are made in the paper on the basis of information gathered over the last two years These may be inaccurate and will need to be confirmed with the appropriate Hungarian entities during the course of any further development of Trading Arrangements and before reaching any decision on the Model to be adopted

2 BACKGROUND - The current operational situation

2 1 Generation Security

MVM currently has the 'Security of Supply' responsibility and manages the generation capacity requirements in accordance with the Act, the Licence and procedures in the Operational Code A generation capacity plan is prepared every two years based on

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demand forecasts from the Supply Companies and from generation de-commissioning and commissioning plans agreed with the Generating Companies in the long term Power Purchase Agreements New generation proposals to meet the UCPTE required capacity margin of 20-25% are presented in an Establishment Plan to Government for approval every two years Following approval a competitive tender process takes place to secure the required generation capacity in the necessary timescales The whole planning and tendering process is still in its infancy and has yet to be proven in its effectiveness There are several operational aspects of the process which currently cause concern notably the validity and accuracy of the Supply Company demand forecasts and the responsibilities, decision processes and advance notice for de-commissioning existing generating plant However, the general process goes some way towards meeting the EU directive on liberalising the electricity sector although there is much work to be done on the Hungarian legal structure as set out in the recent paper (ref Paper on EU harmonisation to the electricity sub-committee, 28 March 1997)

Management of the existing and planned generation capacity in the short term, year ahead down to the real time despatch phase, is now largely conditioned by the requirements of the UCPTE which Hungary joined in October 1995 This sets the standards which the system operator (MVM in this case) must meet in regards to frequency control and area control error (the difference between scheduled and actual transfers across the interconnections with adjacent countries usually referred to as ACE) This requires the scheduling of appropriate quantities of automatic generation control (AGC) and other operating reserves from the available generation capacity There are a number of concerns in this area including a significant problem with generator inflexibility constraints in the despatch processes However, by meeting the requirements of UCPTE, the requirements of the EU directive are also met although there are significant Hungarian documentation modifications required to achieve 'objective, transparent and non-discriminatory criteria' It should be noted that all the costs of meeting the UCPTE requirements, system reserves and inflexibility etc , are 'bundled' into the Wholesale electricity price charged to the Supply Companies

2 2 Transmission Security

The responsibility for managing the security of the high voltage transmission network rests with MVM New transmission capacity requirements, and outages of existing transmission and generation capacity, are coordinated by MVM to a 'n -1' criteria (i e system is planned to be secure in the event of the loss of the single largest contingency either transmission or generation) The transmission 'Control' function (i e the decision making processes) takes place at the MVM Control (Despatch) Center with physical operation of the plant and safety functions carried out on site by the OVIT separate business of MVM OVIT also carries out transmission construction, routine maintenance and emergency repairs Any transmission constraints on the economic selection of generation in merit order are generally eliminated by guaranteed despatch provisions in the long term Power Purchase Agreements with Generating Companies If these are insufficient then 'out of merit' generation is despatched As with generation security costs, all the costs of transmission including capital and depreciation, repairs and maintenance, operations and transmission constraints are 'bundled' into the Wholesale price charged to the Supply Companies

2 3 Ancillary Services

Ancillary Services, i e those services necessary to maintain the security and quality of supply from the transmission system, are currently managed by MVM and in general provided for in the Supplementary fees of long term Power Purchase Agreements with Generating Companies They are therefore 'bundled' into the Wholesale price to Supply Companies There is no methodology set out either in the Licence or the Operational Code which describes how the quantity and location of each service is determined or how the operational control of Ancillary Services is managed Similarly there is no competition for the supply of services or a minimum cost procurement duty on MVM other than the overall minimum cost duty on all entities set out in the Act The most disturbing issue at the present time is the despatch procedures MVM has the responsibility for operational planning (year ahead down to day ahead) to ensure that

sufficient Ancillary Services are available on the day for real time despatch The associated procedures for this planning and despatch are not currently set out in any detail in the Operational Code hence it is not possible to audit the efficiency of despatch Significant development and restructuring of the Ancillary Services trading arrangements will be necessary to meet the requirements of the EU directive regardless of the specific energy market model chosen

2 4 Transmission Losses

Most high voltage transmission systems in the world have energy losses of around 1-2% of the peak demand For the Hungarian system, which is currently lightly loaded, the losses are approximately 1 2% which represents 80MW on peak demand and annual energy losses of just over 400GWh This demand is in addition to the Supply Companies demand and MVM is responsible for scheduling extra generation to meet it At the time of writing no documentation has been made available to explain how MVM manages transmission losses However, during discussions at the despatch center in late 1996 it was stated that new EMS/SCADA computer systems were being installed which, among other facilities, would have modern Optimal Power Flow (OPF) capabilities This will allow the despatch processes to include optimisation of transmission losses by either minimising the total kWh, or the total costs, by adjustment of the merit order despatch of generators Transmission losses will become an important issue in the redesign of the energy trading market and the methodology of managing them will need to be transparent and, if possible, include appropriate commercial incentives At the present time they are simply 'bundled' into the Wholesale price to the Supply Companies with no indication of the management processes involved

2 5 Operational Code

The Operational Code was initially approved by the HEO in October 1995 subject to a number of important conditions These conditions required MVM, who are responsible for the preparation and maintenance of the Code, to undertake a major rewrite of both the text and the appendices to make it comply with the Licence requirements To date this has still not been completed although an Operational Code Committee with representatives

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of all the Generating and Supply Companies has met regularly, appears to be working well, and is reported to be making good progress with the necessary revisions In March 1997 the HEO gave further approval to modifications of part of the text and a number of the appendices which had become necessary due to operational difficulties with implementing the October 1995 version of the Code The complete rewrite is being delayed until the long term Contracts for power purchase and energy sales have been re-negotiated However, it is possible that the HEO will be unable to approve the 'final product' when it is produced later this year without further conditions relating to compliance with the Transmission Licence and the general requirement to have the document wording 'legally tight' Particular areas of concern which may need to be satisfied before HEO can give this approval include the clear setting out of obligations on each of the entities , a comprehensive statement of all operational requirements across the interfaces, comprehensive technical conditions for connection to the transmission system, and comprehensive planning, scheduling and despatch procedures A further area of concern is that the present Code gives MVM responsibilities into distribution system matters which should really belong to the Supply Companies

2 6 Metering

It has been confirmed that the current ownership boundary between the transmission and generation/distribution systems is where most, if not all, the tariff meters are placed However, there may be parts of the system where this is not the case and at these points, for capital cost reasons, it may not be economic to move the existing meters to the true commercial boundary In these cases it will be necessary to have a correction process in place to adjust the meter readings to the values at the commercial ownership boundary The ownership of the tariff meters and associated responsibilities needs to be considered with respect to any proposals to modify the energy trading market The System Control and Data Acquisition (SCADA) information system is usually quite separate from the tariff metering and generally does not present any technical and operational problems in any restructuring of the trading arrangements but this will need considering in due course

3 OPTIONS - For change from the current arrangements

3 1 Generation Security

A continuation of the present two yearly preparation of an Establishment Plan followed by a competitive tendering process is clearly an option for energy trading Models 0 and 1 ('increased competition within existing legal structure' and 'minimum change to meet EU Directive' respectively) assuming that the necessary legal changes to meet the EU directive can be made, as indicated in Section 2 1 herein If the present Hungarian 'Single Buyer' model is extended to include direct bi-lateral contracts between Generators and Eligible Customers, Model 1 in the Trading Paper, then it will be necessary to clearly set out the associated responsibilities for 'Security of Supply' In this scenario there are a number of technical and operational issues which will need to be addressed including 'top up and spill' of imbalance energy from the bi-lateral contracts (the miss-match between contracted energy to be supplied and that taken by the customer) The associated Ancillary Services requirements of these bi-lateral contracts also needs to be coordinated with the 'Single Buyer' arrangements for the rest of the system

The other obvious option is to let market forces secure the necessary generation capacity requirements, as will be necessary in energy trading Models 2 and 3 (the Pool and Bilateral Trading respectively) This will usually involve price incentives linked to the actual generation capacity margin Several methods have been introduced in various countries around the world and the operational experience gained would be useful in tailoring a system to the specific requirements of Hungary However, this reliance on market forces is often considered risky and some 'fail safe' arrangements may be necessary These will usually involve placing duties and associated powers on a particular entity, such as the system operator, to procure extra capacity if the market forces fail to secure sufficient generation margins Again there are a number of technical and operational issues which will need addressing such as the precise definition and recording of the actual capability and availability of generating plant and the mix of generating

capacity in terms of its' fuel supply With approximately 33% of the present capacity being Nuclear, and the remaining being fossil based, there are issues of system security to consider in any changes to the energy trading arrangements

There is a further option which may need consideration relating to the scope and technical characteristics of Demand Side Management (DSM) opportunities The present Hungarian electricity system is quite unusual in respect to its extensive DSM via the Ripple Control Scheme for water and space heating In total this amounts to approximately 600MW (10% of peak demand) with individual values of 200MW in Edasz and 100MW in Demasz Whilst MVM have the telecontrol facilities in their Despatch Center the Supply Companies have responsibilities for decisions when to use the scheme, but it is not clear how selective it is and whether MVM have any 'over-ride' authority to use the scheme for system security purposes There are clearly some issues here which need addressing when considering any new trading arrangements such as whether or not the 600MW is in the peak demand figures and whether it can be used operationally to 'manage' the margin of generation above demand It could also have a significant influence on Ancillary Services although there may be some limitations on its operational use by UCPTE rules which will need to be satisfied

3 2 Transmission Security

The technical and operational aspects of transmission security will be influenced by the proposals for the new trading arrangements It should be remembered that there are two quite distinct and separate functions relating to the management of transmission security There is the transmission control (or despatch) function which is the decision making process, and the transmission operation function which is the physical operation of the facility in accordance with the instructions of the despatch center control engineer The organisations with responsibilities for these two functions are often referred to as the 'System Operator' and the 'Wires Business' respectively

It will be necessary to consider the advantages and disadvantages of combining or splitting the system operation and wires functions in the chosen trading Model Options which will need to be addressed will include who has the responsibility to manage the transmission capacity to the n-1 criteria The decision processes for new transmission capacity to accommodate changes in generation and demands may fall to the system operator with perhaps referral to a higher authority for approvals to commit capital expenditure (this will depend on Regulatory control over the Transmission Business e g a price control) Other key issues which will need to be built into any new trading arrangements include the coordination of generation and transmission outages and the management and cost allocations of system constraints In a more detailed area, but no less important, will be the allocation of powers and duties to manage the secondary components of transmission facilities such as protection relays and other special protection schemes necessary to maintain transmission security All these issues are potentially contentious areas when the ownership and system use functions rest with different Companies particularly if the 'system operator' and 'wires' functions are split

3 3 Ancillary Services

It will be essential to separate out Ancillary Services (AS) to meet the EU Directive even if there are no substantive changes to the trading arrangements At least five AS will be needed i e Automatic Generation Control (AGC), Primary (fast) Reserve, Secondary (or back-up) Reserves, Reactive Power and Black Start There are two basic trading options for each AS, an administered cost of service approach (where the Regulator agrees and monitors the cost components of the service) and a completely free competitive market approach Each method introduces significant technical and operational issues which will need detailed development but there is much experience from other countries which can be used to tailor the arrangements to the specific Hungarian situation

The two fundamental issues which need to be considered early in the restructuring process are the required Licence changes to 'un-bundle' AS, and the authorisation (by Licence Condition) for the system operator MVM to own Secondary Reserves Other

issues which need special attention are whether or not any of the AS have to be mandatory services provided by the generators such as Reactive Power and/or AGC (i e a Licence Condition requiring the Generator to provide the service) or whether all services should be commercially procured and despatched Additionally commercial incentives to manage AS to a minimum cost consistent with the required system security and quality need to be considered together with the methodology for determining the quantities, locations, procurement and despatch procedures, and the eventual cost allocation either on a simple kWh demand basis or on a 'causal' basis i e those that cause the need for the AS pay on the basis of the quantity required

Much of the methodology and procedural processes will need to be set out in the Operational Code in an 'objective, transparent and non-discriminatory manner' and in accordance with the requirements of the UCPTE As mentioned in Section 3 1 earlier there will be a need to carefully consider DSM opportunities to satisfy one or more of the AS The Ripple Control facilities in Hungary present significant opportunities to reduce the costs of AS and should be analysed in depth during the development of alternative trading arrangements Although it has been suggested that UCPTE may not allow DSM for certain system management purposes this should not be simply accepted, it should be challenged on the basis that it is used successfully in other countries (see earlier paper to the HEO in March 1996 and the reply from MVM in September 1996 generally accepting the principles and need to consider further)

3 4 Transmission Losses

Whatever restructuring of the trading arrangements are eventually adopted it will be necessary to un-bundle the transmission losses from the Wholesale price Several criteria need to be addressed before the options for payment can be considered These criteria include which entity, if any, should manage the transmission losses, what commercial incentives will there be for efficient management and will the transmission losses be treated as if they were an additional demand on the system A further criteria is the objective function in managing transmission losses This gives rise to three possible

options either to manage losses to minimise the total kWh, or to manage to a total minimum cost of losses, or to manage losses to an annual Regulated budget with the managing entity taking the financial risk/benefits of deviations from the budget

There are generally three options for recovering the costs of losses The Generators can pay for the losses they incur based on their output and specific location on the network The Suppliers/Eligible Direct Customers can pay based on their location and demands taken The transmission wires owner, and/or system operator, can pay for all losses and recover the costs in the charges for use of the wires Whatever option is chosen the final end customer always pays since the entity bearing the costs will always pass these on in charges, for example the Generators will add an increment onto the energy prices if they have to pay for transmission losses However, the main reason for allocating the payments to Generators and/or one of the other entities is that it gives the appropriate commercial signals for options, which they control, regarding operational performance and location on the network The issue of bi-lateral contracts will also have to be addressed in the overall design of a transmission losses methodology and this can often be a contentious area

Probably the most significant aspect of transmission losses is the fact that the system operator has the most control over losses There may be options for minimising transmission loses in the operational planning phase of outage coordination , in transmission constraint management and in the real time despatch although in all these cases there needs to be clearly defined rules and procedures to allow 'after the fact' technical audit to be carried out The transmission 'wires' owner also has an influence on the level and cost of losses since there are options in the design, construction and maintenance of the assets to make efficiency savings although this usually involves higher costs and a detailed cost/benefit analysis has to be carried out It is for this reason that it is very important to adopt a trading model which has the correct incentives on each entity so that perverse incentives and inefficient actions are avoided

3 5 Operational Code

Following the current rewrite of the Operational Code to meet the HEO approval conditions, which it can be assumed will be completed before any restructuring of the trading arrangements are implemented, it will be necessary to review the structure and content against the adopted new model of the industry One of the actions which will clearly have to be taken will be to remove from the Operational Code all those aspects which relate to the management of the distribution system, and possibly some of the generation systems, so that the Code can be limited only to those issues that affect the interface between the system operator and the parties connected to the high voltage system This raises the question of a need for a Distribution Code, although this may not be the only option for dealing with the low voltage network technical and operational matters

A significant amount of work will be necessary to modify the Operational Code to meet the requirements of any restructuring of the basic energy trading arrangements but the infrastructure to achieve this is already in place via the Code Committee This Committee is relatively small with only ten members with some individual members representing two or three Generating Companies or Supply Companies This Committee structure, and the rules of its operation, may need to be reviewed to see if it meets the needs of any restructuring aspects of the industry

3 6 Metering

Consideration of the options relating to the metering requirements on the system will have to follow the development of the energy trading arrangements but a number of aspects can be addressed at this stage Metering of entry to/exit from the transmission system generally presents the options for Generators to own/install entry metering and Suppliers/Eligible Direct Customers to own/install exit metering or the Transmission wires Company to own/install all high voltage metering With respect to the LV distribution system the developments necessary for 'open access' to Eligible Customers will require the provision of hourly recording meters It will be necessary to consider the

option to install new meters, which will be expensive, or develop load profiling methods to reduce costs Whatever the outcome of these considerations all meters need to be at least hourly measurement, to appropriate accuracy and ideally with remote electronic reading access Any meter replacement programs for domestic customers will need to reflect these potential market trading developments and the eventual open competition at the retail level For these reasons any new retail meters should either have hourly (or ½ hourly) recording facilities, or have the potential for being modified at a reasonable cost if the customer wishes to have the choice of suppliers

4 KEY TECHNICAL and OPERATIONAL ISSUES for EACH MODEL

It is too early to be very specific at this stage on the technical and operational analysis required on each trading model since the options for new trading arrangements are still at an early stage of development (see the companion trading paper) However the technical and operational options set out in Section 3 herein will need a certain degree of further analysis to determine if there are any significant problems which would arise with the adoption of a particular model Whilst this is a possibility, it should be noted that the operations can always be made to meet the commercial arrangements even though in some cases the practical operational problems introduced are not always justified in order to achieve some idealistic economic theory in the trading model A good example of this would be a trading model, for a country with a relatively small electrical demand such as Hungary, incorporating the principles of 'nodal spot pricing' The following analysis sets out a first review of the key issues which may be faced in each of the four trading models The section concludes with an analysis of the advantages and disadvantages of separating the 'operations and wires' functions of the transmission sector

4 1 Model 0, Increased Competition within Existing Legal Framework

This Model is a further development of the existing structure of the industry by facilitating the Supply Company export possibilities and expanding the Direct Supply

Licence provisions to introduce competition between the single buyer/supplier (MVM) and new Independent Power Producers (IPP's) for supplying the larger customers

The tendering process for new generation capacity will be presented with problems since the demand and generation forecasting for the single buyer requirements will become increasingly difficult with increased exports and direct supplies Additionally there will have to be new arrangements for the supply (or take) of imbalance energy from the single buyer to the IPPs with appropriate tariffs which do not discriminate with the franchise customers The key issue for transmission security will be the greater uncertainty in decisions to extend transmission capacity since the development and locations of new IPPs will be outside the control of the single buyer In addition the day to day operational transmission security will have to address the coordination of transmission maintenance outages which affect the IPP supply contracts

In the absence of developing a full Ancillary Services trading system it will be necessary in this Model 0 to make arrangements for the IPP/Direct Supply entities to pay for, or to self provide, the appropriate quantities of AS which will not introduce discrimination with the franchise customers This will inevitably require more transparency in the wholesale price formula which will need to show the AS costs separately and possibly the transmission use of system costs paid by the IPPs Similarly the additional, or reduced, transmission losses caused by the IPPs will have to be accounted for in a transparent and non-discriminatory manner in the wholesale price

The Operational Code will have to be revised to reflect the role of the IPP and its' direct customers if this is not already included in the current revisions (it is not in the present authorised Code for the existing Direct Supply Licencees)

4 2 Model 1, Minimum change 'Single Buyer'

This Model is a further extension of the existing structure of the industry but with some minimum changes to the legal framework to permit the compliance with EU Directive

requirements It will expand the Direct Supply Licence provisions to introduce competition between the single buyer/supplier (MVM) and new IPP's for supplying the larger direct access customers and will require the full development of transmission Use of System tariffs and of Ancillary Services trading

The generation and transmission security issues set out for Model 0 above also apply to this Model 1 The key additional issues for this Model 1 relate to the development of the Use of System tariffs, the Ancillary Services trading and the commercial arrangements for dealing with transmission losses These are all important and complex issues and will need a great deal of analysis and development as set out in section 3 of this paper The same also applies to the issues of the Operational Code and any new metering requirements

4 3 Model 2, The 'Pool Model'

The development of a fully competitive Pool will firstly raise the issue of how long term generation security is to be ensured The present industry arrangements providing a tendering process for new generation capacity is not relevant in a competitive Pool model The market forces of the Pool will have to ensure that the necessary generation capacity is provided in all the timescales from daily scheduling to years ahead The development of Pool rules will have to address these security issues and there are a number of Pool models around the world which can provide the necessary options for meeting the Hungarian requirements Imbalance energy problems of the other models are no longer relevant in a Pool model since the Pool generation and demand is by definition always balanced

Transmission security issues will be the responsibility of the transmission system operator and possibly the wires owner, see the discussion on this issue in section 4 5 below The key additional issues for this Pool Model, as with Models 0 and 1, relate to the development of the Use of System tariffs, the Ancillary Services trading and the commercial arrangements for dealing with transmission losses Again these are complex

issues and experience from other countries will help the Hungarian developments although it will need a great deal of analysis as discussed in section 3 of this paper The same also applies to the issues of the Operational Code and any new metering requirements resulting from the opening of supply competition perhaps down to the retail level

4 4 Model 3, Bilateral Trading

This is probably the most radical trading option being considered and will introduce many new technical and operational problems The generation security in this model becomes a contracting issue for the Suppliers in both the short and long term timescales Contracting Agents (CA) will probably have to present 'balanced schedules' to the Transmission System Operator (TSO) for both the day to day and the longer term scheduling activities with Codes or Protocols necessary to administer the deviations, or imbalances, from the balanced schedules

In a similar way the Ancillary Services requirements will either have to be balanced in the schedules presented to the TSO or a secondary market in AS will be necessary, most probably managed by the TSO Also the 'balanced schedules' presented to the TSO will have to include the effects of transmission losses incurred by the participants of each of the balanced schedules The inclusion of transmission losses will be a complex interactive planning and scheduling process between the TSO and the CAs

Ownership of the transmission wires will be a significant issue in this model which in turn will introduce transmission security problems with respect to provision of the necessary new capacity as the generation and demands on the system change There will have to be adequate market incentives or administrative procedures (i e Regulatory approval) to ensure that sufficient capacity is available on the day for the TSO to manage real time security problems

The Operational Code in its present form will be inappropriate for the Bilateral Trading model and will need to be replaced by a series of separate rules, codes or protocols to set out the commercial trading and operational framework for this model

4 5 Separate or Combined 'System Operation' and 'Wires' Functions ?

This subject may or may not become a significant issue with the selection of the trading model to be developed for more competition in Hungary For this reason the following comments only set out a few of the basic issues which need to be considered before any decisions are taken The issues are common to any of the models being considered in the associated trading paper

The functions and roles that are associated with putting buyers and sellers together, via a set of transmission wires and system operation activities, in a competitive electric power industry, are as follows

1 Transmission system ownership and maintenance of the lines, transformers, switchgear and other assets This function is basically one of asset management, maintenance and construction often referred to as the 'wires' function
2 System operation and control in real time, including despatch of generating plant, maintaining system reliability, maintaining operating reserve, balancing supply and demand and adjusting for losses
3 Scheduling and rescheduling of generating plant in accordance with market rules in the week ahead, day ahead, hour ahead and/or spot market
4 Allocation of available transmission capacity and the collection of transmission charges for use of the system and the co-ordination of energy trading in a single buyer, bilateral contract, pool or spot market
5 Brokering and arranging energy exchanges, usually by accepting and reconciling generator offer and demand side bids (the so called power exchange function) in a week ahead, day ahead, hour ahead or spot market

6 Publishing spot or market clearing prices by reference to system marginal prices, the energy exchange or pool rules and algorithms

7 Metering and data collection after the fact are also market related functions The data collection and handling exercise can involve enormous volumes of data in a large market

8 Settlement system administration follows from metering and data collection in which the pricing algorithms are applied to the collected data

9 The billing process is next in sequence which involves the publication to the market participants of information enabling them to issue bills or invoices

10 Administration of the funds flowing between the market participants

It is also possible to identify distinct, but not always discrete, functions or sub-functions from which transmission services are derived in relation to

- congestion or constraints management
- transmission expansion and reinforcement planning
- transmission expansion and reinforcement implementation
- transmission losses management
- administering and/or creating markets in ancillary services, transmission rights and emissions allowances
- handling imports and exports, as broker or principle, and operating interconnection's
- enforcing codes, protocols and standard procedures
- providing information and advice
- carrying out system studies
- acting as an agency for collecting levies and duties

There are essentially two main models which have been developed in restructurings around the world, (1) the so-called Poolco model of Argentina and Victoria, in which the transmission system was transferred to a 'wires only' company which was separated from the system operations and other market related functions, and (2) the combined models of England and Wales and Norway and Sweden, where all functions are carried out under

one independent 'umbrella' organisation although both, in fact, separate out the 'System Operation' and 'Wires' functions into different businesses within the single company

In the Hungarian restructuring it will be necessary to consider the issues if any preferences are expressed for a combination or separation of the various functions Although the cost to the end consumer of running the system is very small, and thus an economic analysis of the combination of functions is perhaps not too important, there are a few basic observations that can drive the decision as to the choice of structural options

1 Despatch and maintaining reliability clearly go together, as does the administration of the ancillary services market
2 Scheduling and rescheduling can be separated from despatch but only up to a point
3 If co-ordinating energy trading and the matching of supply and demand bids in a power exchange is closely linked to the scheduling process, the same has to be true of co-ordinating spot and bilateral contract trading
4 The final allocation of transmission capacity to reflect the outcome of the scheduling, unit commitment and despatch regime is a natural function for system operation staff who are responsible for controlling the system and maintaining reliability
5 Establishing the market clearing price by reference to the system marginal price is also within the realm of system operation
6 Metering and data collection can stand alone and, in theory, be carried out by anyone
7 Settlement system administration has a strong link with system operation
8 Billing and funds administration can be separated and carried out by anyone
9 The advantages and disadvantages of separation of system operations from the ownership of the transmission wires have not been definitively established anywhere in the world However the most obvious advantages of keeping them combined are that there is a need for fewer rules, protocols and contracts between the two
10 Whether various functions are split or combined there is a compelling need, before making any decisions, to fully analyse the risks and benefits that result

The conclusion of this brief examination of the issues of combining, or separating, the system operation and wires functions, with respect to the Hungarian needs, will have to await the further development of the work on the trading options

5 CONCLUSIONS

Certain conclusions can already be drawn from the technical and operational issues set out in this paper These conclusions may indicate a constraint, a need for further development or a need for some new arrangements in relation to a specific or recommended market trading model However, until the options and preference on a trading model are developed further the conclusions cannot be specific Until then there are some clear indicators of the issues that will have a significant bearing on the final outcome and the following general conclusions should be noted

1 With respect to generation security the issue of which entity has the responsibility for security of supply, or what market incentives can be introduced, will be crucial to the long term requirements In addition, the development of DSM opportunities could have a significant impact on the general management of generation security
2 The key issue on transmission security will result from the whether or not the system operation and wires functions are separated There are many issues related to this and an important aspect may be the management of system constraints particularly if this leads to a development of commercial arrangements for maintaining transmission security In section 4 5 the paper sets out some of the issues which need to be addressed in a separation or combination of the 'system operation' and 'wires' functions and at this stage of development of the restructuring options it is probable that it will best suit the Hungarian requirements to have all these functions combined
3 As a general conclusion it is safe to say that Ancillary Services (AS) will probably be the most significant issue from a technical and operational point of view However, it is important not to get this out of proportion with the scale of changes which may take place in the trading arrangements for energy Whilst the unbundling of AS will be

necessary in order to meet EU Directive requirements the monetary value is probably no more than 5% of the energy market and a pragmatic development is to be recommended Recognising the relatively small electrical size of the Hungarian system a fully competitive market model is unlikely to be practical and a mixture of mandatory obligations and administered costs of procured services is likely to be the most attractive option

4 Transmission losses will have to be unbundled and again this is a very small monetary part of the energy market However, 'losses' tends (largely incorrectly) to indicate inefficiencies and can become a very emotional issue which will have to be carefully developed within the boundaries of practical operational solutions and economic and commercial ideals

5 Whatever the outcome of considering the trading arrangements the development of the Operational Code will require significant resources to meet the requirements of the Hungarian ESI Clarity, and if possible simplicity, of the chosen trading model will need to be reflected in the procedures to operate the supply system The Operational Code being currently rewritten will provide a sound starting point for the future and the mechanism for further development, via the Code Committee, is already in place

6 In any proposed restructuring the tariff metering is always a difficult issue It is technically and operationally not difficult but issues of costs, practicalities, timing and general management of the necessary changes have shown to be critical path matters in several other countries

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ELECTRICITY TRADING MODELS FOR THE HUNGARIAN MARKET

OWNERSHIP STRUCTURE

Bechtel International Consulting Group

ELECTRICITY INDUSTRY OWNERSHIP STRUCTURE

A Report for Bechtel International and USAID
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THE HUNGARIAN ELECTRICITY INDUSTRY OWNERSHIP STRUCTURE

1 BACKGROUND

This paper examines aspects of the current ownership structure in the Hungarian electricity sector that affect the desirability of moving towards a more competitive environment In particular it focuses on the implications of different ownership structures under the models of competition outlined in the paper "Hungarian Trading Schemes", prepared by Arthur Andersen and the USAID team, for the HEO That paper distinguishes between four models

- Model 0 Enhanced Status Quo
- Model 1 Minimum Change Model
- Model 2 Pool Model
- Model 3 Bilateral Trading Model

Model 0 reflects what can be done to maximise competition within the current legal structure of the Hungarian electricity industry, but falls short of meeting the requirements of the EU Electricity Directive Model 1 is the "minimum change" which would satisfy the Directive Models 2 and 3 represent further degrees of liberalisation, which go beyond the immediate requirements of the Directive

For each of these models the current paper sets out where conflicts of interest are likely to arise under different ownership patterns and presents options for dealing with them Since Models 2 and 3 largely raise the same issues in relation to ownership, in this paper we consider them together under the heading of "Further liberalisation"

1 1 The Relationship Between Ownership and Liberalisation

The paper "Hungarian Trading Schemes" has addressed the question of the appropriate degree of liberalisation for the Hungarian electricity sector, and has outlined the main relevant systems

This paper focuses on ownership Owners are defined as those who have the residual entitlement to the profits of the enterprise (For corporatised entities, the owners are the shareholders) Ownership is important because of the different incentives that arise under different ownership structures These incentives will affect the outcome of any liberalisation measures and therefore have important implications for the desirability of adopting a particular market structure

The rationale for liberalising the electricity market is the potential for improved efficiency Specifically, competition provides incentives for increased efficiency in despatch, maintenance and investment in generation However, for this to be the case, there are several requirements which have to be met In particular

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- Companies must act in a profit maximising way,
- There should be a large number of (actual and/or potential) players in both generation and supply activities,
- Barriers to entry should be low, and
- The government is able to make credible commitments both in civic law (ie contracts) and regulation, to enable a high degree of assurance that an investor will be able to recover sunk costs

These requirements in turn have implications for ownership Questions of ownership therefore become more relevant as moves towards more liberal trading arrangements are considered Models 1, 2 and 3 therefore raise more ownership concerns than Model 0 Moreover, the majority of these concerns are common between the three more liberal models, but become more critical the greater the degree of liberalisation

The structure of the paper is as follows In the remainder of this section we summarise the current ownership structure of the electricity sector in Hungary Section 2 then recaps on the four models of competition, summarises the economic arguments for restrictions on ownership, and sets out the options for addressing questions of ownership This provides the basis for the analysis in Section 3, which relates each of the models to the current ownership structure in Hungary and makes recommendations for dealing with the ownership concerns which arise Section 4 concludes

1 2 Current Ownership Structure

Changes in ownership are distinct from changes in an industry's structure The electricity sector in Hungary was restructured at the end of 1991 A programme of privatisation (ie a move from public to private ownership) was begun in 1995, with private firms initially becoming joint owners with the government The Hungarian privatisation has attracted foreign investors, resulting in a significant degree of foreign ownership in the sector The current ownership stakes held by foreign investors are shown in Table 1 1

Currently, the state company MVM owns 100% of the national grid company (OVIT Rt) and the Paks nuclear power station As well as being responsible for the transmission system, MVM handles despatch, and acts as a monopoly power wholesaler, purchasing power from the generating companies and imports, and selling it on to the supply companies It is planned to eventually offer a minority stake in MVM for sale The Appendix to the Privatisation Law sets out that 50%+1 of the shares in MVM are to remain in long term public ownership

The generation sector is comprised of seven fossil fuel generating companies and the Paks nuclear station With the exception of Dunamenti (which runs on heavy fuel oil and natural gas) and Budapest (natural gas and fuel oil), all the fossil fuel generating companies include integrated coal mines Minority stakes (of around 49%) have been sold to foreign investors in two generating companies The investors have the opportunity to obtain majority stakes of 50% plus 1 through a further capital raise to fund investment Powerfin has already used

this right to gain a majority holding in the Dunamenti power station Majority stakes in a further two generators have also been sold However, offers of majority stakes in the remaining three fossil fuel generators failed to attract acceptable bids, and they currently remain in state ownership The Paks nuclear station also remains in state ownership, as part of MVM, although it is a potential candidate for privatisation

Minority stakes (of around 48%) in all six supply companies have also been sold, all to foreign investors The supply companies combine ownership of the distribution wires with retailing of electricity to final consumers These investors have some management rights and pre-emption rights to increase the stake to 50%+1 by the end of 1997 Both RWE and EdF have interests in two supply companies EdF has obtained the necessary approvals to sell half of its stake in EDASZ to Bayernwerke Bayernwerke is also seeking to buy Isar-Amperwerke, which would give it indirect ownership over a third supply company, TITASZ

The Hungarian government holds a "golden share" in each of the privatised generation and supply companies, giving it the right to exercise special voting rights on strategic questions

Although the Hungarian electricity sector has been restructured, the degree of liberalisation remains minimal MVM has a monopoly right to purchase power from generators as well as a monopoly on wholesale supply The supply companies themselves have a monopoly on supply to all customers in their area [1] Both sales of power from the generators to MVM and from MVM to the supply companies are governed by long-term contracts Thus, the industry currently is effectively continuing to operate in contractual terms as a vertical monopoly

[1] There is a potential within the current framework for ad hoc exceptions, via the granting of direct supply licences to self-use generators DEDASZ is currently challenging HEO s granting of such a licence to a planned new plant at Dunaferr

Table 1 1
Current Foreign Ownership in Hungarian Electricity Industry

Company	Foreign Ownership Stake
Generating Companies	
Dunamenti	Powerfin SA
Matra	RWE-EVS AG
Budapest Eromu	IVO Finland
	Tomen Japan
Tisza Eromu	AES
Bakony	None
Pecs	None
Vertes	None
Paks	None
	(100% owned by MVM)
Supply Companies	
TITASZ	Isar-Amperwerke
DEMASZ	EdF
EDASZ	EdF, Bayernwerke AG
DEDASZ	Bayernwerke AG
ELMU	RWE-EVS AG
EMASZ	RWE-EVS AG
Transmission Company	
OVIT Rt	None
	(100% owned by MVM)

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2 OPTIONS

2 1 Liberalisation in the Hungarian Electricity Sector

In Hungary, the question of liberalisation of the electricity sector is being considered in connection with compliance with the EU Electricity Directive The EU Directive requires a minimum amount of liberalisation of Member States' electricity sectors, and an unbundling of separate functions The implications of the Directive for the Hungarian electricity industry have been considered in detail in a previous paper [2]

The companion paper on "Hungarian Trading Schemes" outlines four alternative liberalisation models for the Hungarian electricity sector We recap on the key features of each of these models below

2 1 1 Model 0 Enhanced Status Quo

Under Model 0, competition is maximised within the current industry structure in Hungary, but the degree of liberalisation falls short of meeting the requirements of the Directive Specifically, under the current law we understand that MVM cannot be mandated to grant access to its transmission network to competing generators or electricity suppliers

Steps which could be taken under Model 0 (and which are recommended in the companion paper) include (a) a requirement for a separation of accounts for the different functions within MVM, and (b) the formation of autonomous units Competition for new generation could be enhanced by the replacement of the current opaque arrangements with published, transparent criteria and processes, in which MVM does not have a proactive role

Limited liberalisation in supply may also be possible under the current structure via the extension of direct supply licences to self-use generators However, HEO is currently being challenged on its issue of a supply licence to a self-use plant at Dunaferr, which would allow it to sell its excess power to other customers The move is being contested by the area's supply company, Dedasz, as a violation of its monopoly

2 1 2 Model 1 Minimum Change

The "Minimum Change" model represents the minimum degree of change from the present Hungarian system which complies with the requirements of the EU Directive[3]

There are three key areas of liberalisation under the Directive, relating to (a) new generation, (b) opening of the supply market, and (c) access to the transmission system

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2 Potential Conflicts Between Existing Hungarian Law and the European Union Directive on Liberalisation of the Electricity Sector, March 28 1997

3 Here we use the term Minimum Change Model to refer to any trading arrangement which encompasses the particular features discussed In reality there are several different organisational arrangements which could be adopted in order to achieve this degree of liberalisation The precise arrangement to be adopted would be matter for further consideration by HEO

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With respect to **new generation**, to comply with the Directive, Hungary would need to establish either an authorisation process or a tendering process *and* an authorisation process In both cases transparent and non-discriminatory criteria must be developed Where a tendering process is adopted, the body responsible must be "independent of electricity generation, transmission and generation activities "[4] This implies that MVM would not be eligible to operate the tender

The second requirement under the Directive is a minimum degree of **opening of the supply market** This implies an end to MVM's current monopoly on wholesale supply, and to the distribution companies' monopoly over supply The Directive establishes the minimum proportion of each members' market which must be opened to competition The consumers to whom the provisions are extended are referred to as "eligible customers", and must include all consumers with an annual demand above 100 GWh

In addition to the opening of the supply market, the Directive requires that Member States implement one of two options for **system access** negotiated access or a Single Buyer procedure The two systems are intended to produce equivalent economic results In both cases, eligible consumers must effectively have access to buy electricity from independent producers The Single Buyer variant represents the minimum organisational change from the current industry structure

Finally, compliance with the Directive requires an **unbundling** of functions in integrated companies (Article 14) Such companies are required to keep separate accounts for generation, transmission and distribution activities, as if they were separate activities[5] In addition, the transmission system operator (MVM) must be at least managerially independent from generation and distribution activities

2 1 3 Further Liberalisation

The requirements of the Directive represents a minimum which needs to be complied with as part of the process towards EU membership The Hungarian authorities may, however, wish to consider going beyond these requirements, if they feel there are advantages in terms of achieving greater efficiency in the electricity sector

Model 2 (Pool Model) and Model 3 (Bilateral Trading Model) both represent further degrees of liberalisation Under Model 2, generators, distribution companies, end-users and intermediaries would have access to the transmission network, with trades occurring via a Pool mechanism In contrast, under a Bilateral Trading model, distribution companies and end-users would contract directly with generators and intermediaries, with the system being supported by an Independent System Operator (ISO), with responsibility for scheduling and settling imbalances

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4 Article 6 Paragraph 5

5 The Directive does not explicitly require a separation of accounts for the distribution wires business and electricity retailing activities

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As presented in the "Trading Schemes" paper, system access for distribution companies and end-users under each of these two models would be in line with the timetable set out in the EU Directive, ie 22% of the market would initially be opened to competition In section 3 2 we also consider the implications for ownership of extending competition to retail consumers

2 2 Implications of Different Ownership Structures for the Effectiveness of Competition

In Section 1 1 we noted that there are several requirements that have to be met if liberalisation is to result in improved efficiency Some of these requirements imply that competition may not increase efficiency in the face of ownership structures with certain features, such as

- common ownership within a specific function (ie horizontal integration),
- ownership across different functions (ie vertical integration), or
- particular types of owner (ie public or private)

The exact implications of different ownership structures for the effectiveness of competition will differ depending on the form of liberalisation being implemented

Below we summarise the economic arguments for restrictions on ownership Options for addressing the potential difficulties associated with ownership are presented in Section 2 3 Section 3 relates the discussion to the models of liberalisation being considered in the Hungarian context

2 2 1 Horizontal Integration

The argument for horizontal integration within any industry is the potential for economies of scale The technology of the industry may be such that larger firms are able to operate at a lower cost than smaller firms (ie economies of scale are present), and it is therefore more efficient to have a small number of large firms operating in the industry than a large number of smaller firms However, where there are only a few firms operating within an industry they may be able to exercise market power (either individually or by colluding) and increase prices significantly above costs, reduce quality or carry out inefficient investment The extent to which firms have market power depends not just on the actual number of competitors in a market, but also on potential entry Specifically, where barriers to entry into the market are low, the ability of new firms to enter the market is likely to constrain the behaviour of firms already in the market

Transmission and distribution are both natural monopoly functions with significant economies of scale For generation and supply, the potential economies of scale are much less significant [6]

[6] In the case of generation, developments in the technology employed (particularly the development of gas-powered CCGTs) have greatly reduced the optimal size of plant

2 2 2 Vertical Integration

Common ownership across functions (ie generation, transmission, distribution and retail) can potentially lead to conflicts of interest A company may be able to increase its overall profits by acting in a way which would not be consistent with profit maximising behaviour if the firms were separately owned, this is usually described as "self dealing" Where this occurs, the introduction of competition may not result in improved efficiency

Below we look at the potential conflicts of interest which arise under specific cases of common ownership

2 2 2 1 *Common ownership of transmission and generation/supply*

In a situation where there is competition in generation, a conflict of interest may arise where the transmission system operator (TSO) also has interests in generation In particular, the TSO may have an incentive to despatch its own generator in preference to those owned by other companies, even though the latter may be lower cost Similarly, where the TSO is responsible for issuing and evaluating tenders for investment in new generating capacity, there is a conflict of interests if the TSO is also responding to such tenders

The conflict of interests becomes more acute where there is also competition in wholesale supply, and the TSO finds itself having to allow competing generators access to the transmission system in order to supply what were previously its own generators' customers Since this is not in the TSO's interests as an owner of generation, the TSO may try to restrict access, thereby obstructing competition The TSO may also impose penal charges for supplying top-up and stand-by power from its own generators to competing generators In all such cases the TSO's actions will affect competitors' operational and investment decisions, with the result that the anticipated efficiency gains from the introduction of competition do not in fact materialise

An analogous situation arises where the transmission provider also sells power to final consumers who are in a potentially competitive market The TSO will be reluctant to allow access to its network for competing suppliers to offer an alternative supply to those customers

2 2 2 2 *Common ownership of generation and supply*

Where there is a monopoly on wholesale supply, the extent of any common ownership between generation and supply companies does not raise difficulties, since the two companies are not allowed to deal directly with each other

As soon as the monopoly on wholesale supply is removed, suppliers who also have generation interests have a potential to "self deal", providing that they retain some captive customers (ie a situation where there is not full retail competition) Suppliers have an incentive to contract for power from their own generator, rather than search for a cheaper source of power, since the supplier can pass on the costs of generation to its captive

customers and this is more profitable for the integrated company as a whole Similarly, suppliers have an incentive to invest in generation, regardless of whether this represents the most efficient outcome Under this scenario, the generators who are connected to suppliers have a guaranteed market and therefore have no need to improve their efficiency, and independent generators have fewer opportunities to sell their power Overall, the level of competition in generation falls, with resulting higher prices and costs, for both the operation and maintenance of existing generation and new investment

Where there is full retail competition, so that there is no possibility of cross subsidising from other activities, self dealing concerns disappear Suppliers no longer have any captive customers, and therefore cannot pass on higher generation costs In this situation, vertical integration between generation and supply no longer presents a problem, and may even be a natural arrangement, as the margin in the supply business alone is very low [7]

2 2 3 Public Sector Ownership

Public sector owners may have objectives other than profit maximisation (eg employment concerns) Where these other objectives play a large role relative to commercial objectives, competition will not automatically lead to increased efficiency Publicly owned firms may be placed at a competitive disadvantage, through a requirement to meet social policy objectives, such as the maintenance of an uneconomically high employment level

On the other hand, public firms may have a lower cost of capital or less aversion to risk than private firms, because of access to finance from taxes Therefore, publicly owned firms may invest in riskier, more capital intensive generation projects There is also a danger that easy access to government finance could allow publicly owned firms to undercut competing private suppliers

2 3 Options for Addressing Ownership Problems

In the previous section we noted that various ownership structures may affect the extent to which introducing competition into the electricity market results in an improvement in efficiency One option is therefore to limit the extent of liberalisation to those areas where competition truly affects efficiency, such as the construction of new generation and the despatch of generation not governed by contracts

If liberalisation is planned on a wider scale, the options for addressing ownership problems fall into three general categories

- legal restrictions on ownership,
- unbundling to establish independent ownership (regulation by structure), and
- regulation of firms' behaviour (regulation by conduct)

[7] The extension of retail competition goes beyond any of the models currently being discussed for Hungary, and is not currently present in the vast majority of countries world-wide

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We briefly consider each of these options in turn below In Section 3 we analyse the need for specific limitations in the context of each of the four models of competition being proposed for Hungary

2 3 1 Restrictions on Ownership

Statutory restrictions can be placed on ownership, *a priori*, in order to prevent the emergence of an ownership pattern which does not support competition Such restrictions are matters of competition policy as much as of regulation

Where market dominance is seen as a threat to the effectiveness of competition, a priori restrictions may aim to prevent horizontal integration In particular, limitations may be placed on the number of generating or supply companies in which an investor is allowed to hold interests Alternatively, the limit may be interpreted in terms of a maximum market share associated with an investor's holdings, rather than on the number of companies

Similarly, restrictions can also be placed on the degree of vertical integration These restrictions can include "own generation" limits for supply companies, which limit the amount of generation in which a supply company can have share-owning interests Limitations can also be placed on the transmission operator having ownership interests in generation, distribution or supply

It is possible to impose restrictions on private ownership, by specifying assets which are to remain in public hands Similarly, the government may choose to define certain strategic assets in which foreign ownership is prohibited or restricted to a minority share

2 3 2 Unbundling

One structural approach to the ownership question is legal restrictions on ownership However, the question also arises as to how far the *existing* ownership structure is unacceptable, and requires unbundling There are two approaches to unbundling divestment, to result in an actual change in ownership, or regulation, to result in a separation of functions without a change in ownership

2 3 2 1 Corporate Divestiture

Corporate divestiture can take various forms, such as (1) a requirement to sell an existing ownership stake to a separate owner, (2) a long-term leasing arrangement, or (3) a management contract which separates ownership from operational control

For publicly owned firms, structural options for addressing ownership problems include (1) privatisation (ie a change from public to private ownership), or (2) corporatisation, with managerial autonomy so that firms can operate as fully commercial entities

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2 3 2 2 *Regulatory Unbundling*

In the case of vertical integration, regulation can require separate management and accounts for different functions, in order to "ringfence" the distinct businesses Under such regulation, businesses which have a common owner are required to sell to each other at transparent transfer prices, which are regulated to reflect the true costs involved

Regulation can also address the incentive problem caused by ownership of the transmission grid and generation or supply interests To support mandatory access provisions, many regulators encourage integrated electricity companies to create an "Independent System Operator", which is independent in accounting and managerial terms from generation and supply interests

2 3 3 Regulation of Firms' Behaviour In a Market

The previous two sections focused on ownership structure An alternative approach is the regulation of firms' conduct or performance, such that the outcome attempts to mirror that which would have been achieved if the firms had in fact been under separate ownership

A common form of such regulation aims at preventing an abuse of market power, in a situation with significant horizontal integration, through regulatory controls on prices or profits Acceptance of this approach normally signals the abandonment of competition, but not in all cases

Regulation can also expand competition to address the potential for "self dealing" under a vertically integrated ownership structure Where electricity suppliers also have generation interests (eg RWE's common ownership of ELMU, EMASZ and the Matra power plant), they may be required by conditions in their licences to purchase power from the most economic source Similarly, a power wholesaler with generation interests (eg MVM) can be required to purchase power at the cheapest price, and generators can be prohibited from discriminating in the price they charge for their power to comparable parties To address the problem of inefficient investment in generation, regulators can establish a system of competitive bidding for the right to build new capacity, such as the tendering process under the EU Directive

Mandatory access provisions can be used to require owners of the transmission grid to provide system access on transparent and non-discriminatory grounds Such provisions can be used to facilitate the expansion of competition, in a situation where the owner of the grid also has interests in generation and/or supply

Regulation of the behaviour of publicly owned companies may also be successful in ensuring that competition leads to improved efficiency In the UK, the publicly owned nuclear generator was required under its " Self-Denying Ordinance" to issue all contracts by public auction, in order to prevent any discrimination

A common problem associated with all forms of regulation of firms' behaviour is that of enforcement and ensuring compliance This problem is likely to be more serious where the market structure remains unbundled We return to this as part of the analysis in Section 3

3 ANALYSIS

In the following sections we highlight the important ownership issues which arise under each of the three models of competition being considered for Hungary and present options for addressing the concerns that arise

3 1 Model 0 Enhanced Status Quo

Increased liberalisation of the electricity sector within the current legal framework raises only minor ownership concerns, mainly connected with MVM's current ownership of both transmission and generation assets

3 1 1 Horizontal Integration

3 1 1 1 Generation

Under the current industry structure in Hungary, generators sell their power to MVM under long term contracts, which define their total remuneration Despatch is on the basis of cost This results in a limited degree of competition However, since they are operating under a contract, existing generators are not exposed to competition from new generators

In view of the very limited degree of competition in the enhanced status quo model, the issue of horizontal integration is not of major significance However, there is a possibility that common ownership of several generation companies may result in one owner gaining a degree of market power sufficient to force a renegotiation of the existing contracts with MVM Moreover, companies may act in a strategic manner to build up ownership stakes with the aim of exploiting any consequent market power in the event that the market is liberalised (see 3 2 1 1)

Presently there are six owners operating in the generation sector At privatisation, restrictions were placed on the degree of horizontal integration allowed in the sector, with companies not permitted to gain an interest in more than two generators (three in the case of consortia) However, these restrictions do not form part of any statutory restrictions on ownership of generation and there are no legal restrictions to prevent reaggregation of generation [8] That is not to say that there are no routes via which reaggregation could be prevented HEO has a role in merger discussions, and its written consent is required for any merger (Generation Licence, Section 9 1) The government could also exercise its rights under its golden share to veto any merger plans

Structural approaches to horizontal integration raise competition policy questions as much as regulatory questions This is therefore an area in which HEO needs to work closely with the Competition Agency In particular, HEO and the Competition Agency should together formulate a strategy on the degree of common ownership they are prepared to see within

[8] There are provisions for the initial period following privatisation Tender restrictions restrict owners from selling any shares for five years after privatisation, or from obtaining shares from any sources other than the Privatisation

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the generation sector Such a strategy should be agreed with the government and communicated to the parties operating in the electricity sector As part of such a strategy the agencies should consider under what circumstances and how far they are prepared to use their existing powers (noted above) and whether they require any additional, legal restrictions on ownership (see Section 3 2 1 1)

3 1 1 2 Supply

As with generation, the main ownership concern under the current market structure for the supply companies is the degree to which mergers could result in sufficient market power to enable the companies to renegotiate long-term supply contracts, to the disadvantage of MVM There is also the issue of potential strategic positioning of companies in anticipation of the market being liberalised

There are currently no legal statutory limitations on ownership in the Hungarian supply market At privatisation, companies were not permitted to gain an interest in more than two supply companies (three in the case of a consortium) EdF and RWE each currently have interests in two supply companies Bayernwerke could emerge with a stake in three As in the case of generation, the government can, in principle, play a role through the exercise of its golden share, and the HEO's written approval is required for any merger

For supply, we recommend, as with generation, that HEO and the Competition Agency should agree on the extent to which they feel common ownership between supply companies is acceptable, and decide on a strategy for tackling reaggregation

Such a strategy should also encompass self-use supply If competition in supply is to be enhanced under the existing structure by allowing self-use generators to supply neighbouring sites, along the lines of the self-use direct supply licence issued to Dunaferr, it will be important to prevent the local distribution company from owning a stake in these self-use generators

3 1 2 Vertical Integration

3 1 2 1 Common ownership of generation and transmission

Currently in Hungary, MVM as the TSO and the monopoly power wholesaler also owns the Paks nuclear power station

We noted in Section 2 2 2 1 that the common ownership of generation and transmission assets could lead to potential conflicts of interests in

- despatch,
- tendering for new investment, and
- system access

Body (APV Rt), unless permission is received from the Hungarian Energy Office, the Competition Office and APV Rt itself

Since Model 0 does not require MVM to grant access to its transmission network, the third potential area of conflicting interests does not currently arise

In the case of the Paks plant, the degree of conflict associated with despatch is in fact likely to be limited Since the nuclear plant has the lowest operational cost of the current generators in Hungary, it should be despatched first, regardless of ownership However, ownership by MVM of any additional generation would lead to a potential conflict of interest in despatch Such ownership could arise either by investment in new generation by MVM or via MVM's privatisation, where a private investor in MVM also had interests in a generating company

Under Model 0, new transparent criteria are proposed for the tendering for new investment MVM would also not be permitted to respond to such tenders This should remove the second area of conflict noted above

There are already provisions in Hungarian law aimed at addressing the potential conflicts of interest from common ownership of generation and transmission These provisions span several of the options outlined in Section 2 3

Restrictions on Ownership	Under MVM's transmission licence (Section 4 4) it is prohibited from acquiring any more generation, with the exception of secondary reserve
Divestiture	Divestment of the Paks generating plant from MVM is planned under Government Resolution 10/63 1995
Regulatory Unbundling	MVM is required under its transmission licence (Section 8) to keep separate accounts and management of generation and transmission activities As a condition of the transmission licence, HEO's written approval is required for any merger of the licence holder "with other economic associations" (Section 10 1)
Regulation of Behaviour	Under Section 41(3) of the Electricity Act, MVM is obligated to purchase power at the lowest price, and not to discriminate between generators These requirements are repeated in its Transmission Licence (Sections 4 1, 4 3)

In practice, regulatory requirements on economic purchasing can prove hard to enforce Structural restrictions on ownership are likely to prove more effective HEO should therefore press for the divestment of Paks from MVM, as planned under the Government resolution If this is not currently feasible, as a (short-run) alternative to outright privatisation, the Hungarian authorities could consider a long-term leasing arrangement, or a management contract which separates ownership from operational control

In the light of the potential privatisation of MVM, HEO and the Competition Agency need to decide on whether the statutory prohibition on MVM acquiring more generating capacity should be interpreted as requiring divestment of generating interests within Hungry by any future investor gaining a significant ownership stake in MVM We would recommend a requirement for such divestment

In the case of foreign investors, generation interests in power stations in neighbouring countries should also be taken into account (eg EdF has ownership interests in Mochove in Slovakia) Such investors, if they also controlled the despatch function in Hungary, would potentially be able to import power from their generation interests outside of Hungary, rather than despatch competing generators Requiring divestment under these circumstances is likely to be unrealistic, implying a reliance on either regulatory unbundling (eg separate accounts for management of generation and transmission activities), or the regulation of behaviour (eg requirement on MVM to purchase power at the least cost)

3 1 2 2 Common ownership of generation and supply

MVM's current monopoly on wholesale supply, means that the extent of any common ownership between generation and supply companies does not raise difficulties, since the two companies are not allowed to deal directly with each other This argues against allowing any company who also has interests in generation or distribution companies to also gain an interest in MVM Investors may also try and build-up cross ownership stakes as a strategic move, in anticipation of a relaxation in MVM's wholesale supply monopoly (see 3 2 2 3) HEO should work with the Competition Agency to develop a strategy to address such ownership moves In particular, the agencies should agree on whether legal limitations on cross ownership are desirable (see 3 2 2 3)

3 1 3 Public vs Private Ownership

The Hungarian electricity sector currently combines both public and private ownership The state (through the privatisation agency APV Rt) maintains significant ownership stakes in all of the privatised supply companies, and two of the privatised generating companies In addition, the Paks nuclear plant and the transmission network remain fully state owned

The Hungarian government may be unwilling to yield majority control to a private investor for assets which it considers to be of stategic importance As we noted in Section 2 3, it is possible to impose specific restrictions on private ownership for such assets The Privatisation Law requires that 50%+1 of the shares in MVM are to remain in long term public ownership In other cases, rather than retaining complete control over the asset, the government (through the Ministry of Trade and Industry) has retained a "Golden Share", which allows it to exercise special voting rights on strategic questions (eg mergers and takeovers, a change in the scope of activity of the company)

In Hungary, four generators remain in public ownership, competing with three privatised generating companies Where publicly and privately controlled firms are operating

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alongside each other, there are likely to be allegations over the lack of a level playing field, as we discussed in Section 2 2 3

The structural options for levelling the playing field are the privatisation or full corporatisation of the remaining generators Regulatory options would focus on restricting the behaviour of the public generators In other countries, the physical separation of ownership has often been found to be more effective than regulation We would therefore recommend that the Hungarian authorities continue with efforts to privatise the remaining generators If this is not currently feasible, the companies should be fully corporatised so that they operate as fully commercial entities (Our understanding is that the current organisational arrangements may not meet this criteria)

3 1 4 Foreign vs Domestic Ownership

In Hungary, many of the tensions between public and private ownership are exacerbated by the division between domestic and foreign ownership, since the major strategic investors at privatisation have all been foreign and (with the exception of EdF) are all private companies

The introduction of competition is not affected by the extent to which firms are either foreign or domestically owned However, there are significant political implications arising from foreign involvement Foreign firms may be seen as less sympathetic to Hungarian concerns, in particular the need to restrain tariff increases They may also expect higher returns and a shorter payback period than their local, public sector competitors, since they are comparing investment in Hungary with the returns available in a wide range of other countries

The government may be drawn into offsetting the demands of foreign firms by its requirements on those firms remaining in public ownership Recent reports comment on the margin earned by MVM and the publicly owned generators being squeezed in order to try and accommodate higher returns for the privatised generators and supply companies There is therefore a potential to create resentment, which is likely to remain for as long as there is insufficient revenue in the system to allow all parties an adequate return This holds true for all of the liberalisation models being considered for Hungary, but is perhaps more acute the lower the degree of liberalisation, not least since more liberal models will require tariffs to be unbundled and to rise to more sustainable, economic levels

3 2 Model 1 Minimum Change

Liberalising the market in line with the EU Directive, even to the minimal degree represented by the Single Buyer Model, exacerbates the problems of common ownership present in Model 0, and introduces some additional concerns However, there are provisions in the Directive which are aimed at addressing these potential problems and which would need to be incorporated into the Hungarian legislation In several cases, the Directive's requirements reinforce some of the existing provisions in Hungary (eg

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requirements on keeping separate accounts for MVM's generation and transmission activities)

3 2 1 Horizontal Integration

3 2 1 1 Generation

Liberalisation in line with the EU Directive, would allow generators to compete to sell direct to eligible consumers, as well as to MVM [9] However, since the majority of power sales are governed by long term contracts, the degree to which the introduction of competition can provide additional incentives for efficiency may be limited, and raises issues of stranded costs [10]

Ownership issues relating to competition are only important to the extent that there are power flows not governed by contract If the degree of uncontracted power flows within the Hungarian electricity sector does rise, then questions of ownership and market dominance start to become relevant

We have already considered (Section 3 1 1 1) the current restrictions in Hungary on ownership in generation The case for going beyond the current provisions and establishing statutory limits on either the number of generating companies in which companies have a share stake and/or on the maximum market share allowed would depend on an assessment that there are significant barriers to entry in generation If this is not the case, the threat of new entry can be expected to constrain the behaviour of existing firms

The Hungarian authorities could choose to regulate to prevent any abuse of a dominant position, rather than imposing direct limitations on ownership The regulatory approach has the benefit of flexibility Rather than the absolute number of players in the market, what is important is the degree of competition in each *sector* of the market, ie baseload, mid-merit and peaking Moreover, the *threat* of new entry may be sufficient to prevent firms abusing their position A regulatory approach would, in theory, be able to take all of these factors into account However, in practice it is a very demanding task, especially in the case of an emerging regulator In the UK, OFFER has found it difficult to promote competition without efforts to restructure ownership

In view of the difficulties associated with regulation, it would seem preferable for the Hungarian authorities to prevent the emergence of a dominant position via restrictions on ownership However, in the absence of substantial barriers to entry in generation under the Minimum Change model, the existing powers of HEO and the Competition Agency would seem sufficient for this purpose The introduction of statutory limitations is therefore probably not necessary However, as under Model 0, HEO and the Competition Agency

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[9] 22% of each Member s market must initially be opened to competition in 1999, with the proportion then rising progressively over four years

[10] These are discussed in the companion paper covering Financial Issues, prepared by Arthur Anderson and USAID for HEO

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will need to formulate a clear strategy on when and how they will use the powers that they have

3 2 1 2 Supply

If the Hungarian authorities wish to prevent reaggregation in the supply sector, they could place statutory restrictions on the common ownership of supply companies However, the introduction of competition in supply in line with the minimum required by the Directive does not appear to raise significant questions of market power In particular, the barriers to entry for a generator wishing to sell power directly to eligible consumers would not seem substantial The case for placing restrictions on the ownership of existing supply companies is therefore not a strong one The only exception is if the Minimum Change model is seen as a transitional stage on the way to Models 2 or 3, when common ownership between supply companies raises significant concerns regarding market power (see Section 3 3)

3 2 2 Vertical Integration

3 2 2 1 Common ownership of generation and transmission

We noted that under the current structure, common ownership between MVM and generation could potentially lead to a conflict of interest in despatch and in tendering for new investment The EU Directive makes several requirements which would support and extend the Hungarian legislation in this area

Restrictions on Ownership	In order to comply with the EU Directive, the operation of the tender procedure would have to be carried out by a body independent of MVM
Regulatory Unbundling	The Directive would require MVM to keep separate accounts and management of generation and transmission activities (This is currently required under MVM's transmission licence)
Regulation of Behaviour	The Directive requires the power purchase function to be at least managerially separate from generation and transmission The Directive requires the development of transparent, non-discriminatory despatch procedures

Liberalisation of the market to allow system access in line with the Minimum Change model raises a further potential conflict between the ownership of generation and transmission assets The extent to which there would be a conflict in the current Hungarian situation will depend on the continued ownership of Paks by MVM and the extent to which Paks is currently supplying potentially competitive consumers

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The Directive requires non-discriminatory, transparent procedures to be developed to provide system access and enable eligible consumers to contract for power with other parties However, again, structural solutions, such as the divestment of Paks (either through privatisation or under a management contract), are likely to be more effective in addressing this concern than regulatory requirements This is particularly the case if the Single Buyer variant of Model 1 is adopted, since this would entail a lower degree of unbundling and transparency than under a negotiated access arrangement We would therefore recommend that the authorities consider how best in practical terms to implement such divestment in the near future

The Single Buyer variant of Model 1 introduces a new function, ie that of the Single Buyer power purchaser as a separate entity The Single Buyer needs to have sufficient degree of financial strength as well as demand forecasting expertise The Directive requires that the Single Buyer should be at least managerially separate from generation and transmission (Article 15) It would therefore be possible for MVM to carry out the Single Buyer function, as long as it was ring-fenced from its other activities However, a further reform step would be to establish the Single Buyer completely outside of MVM One possibility would be for it to be owned by a consortium of the supply companies, with or without MVM participation Such an arrangement may facilitate any transition to more widespread wholesale competition, through widening exposure to the competitive market We would recommend that the HEO consider the options and discuss the possibilities with relevant parties and, in particular, with the supply companies and the Competition Agency

3 2 2 2 *Common ownership of transmission and supply*

As we saw in Section 2 2 2 2, the requirement to allow system access leads to a potential conflict in interests for a company with ownership stakes in both transmission and supply

Under the current ownership structure in Hungary, transmission and the supply companies (which combine the distribution and retail functions) are separate However, in 1995, the offering of a 24% interest in MVM attracted a bid from a consortium of Bayernwerk, EdF and Asre-Tessin Bayernwerk has indicated its interest in bidding again Potentially, therefore, a situation could arise in which the same firm had interests in both transmission and supply

The range of options for addressing vertical integration between transmission and supply in order to ensure the effectiveness of liberalisation measures are similar to those outlined above for joint ownership between generation and transmission In terms of restrictions on ownership, there is currently no restriction in MVM's transmission licence which prohibits it from also having an ownership stake in supply, as there is with generation The Hungarian authorities should consider incorporating such a provision, together with a requirement for any new, private investor with a significant share stake in MVM to divest itself of any supply interests

Regulatory unbundling in the form of the separation of management and accounts would be required under the EU Directive As noted above, the Directive also requires arrangements

to be put in place to provide access to the transmission system, on a non-discriminatory basis The restrictions on ownership recommended above would support these regulatory obligations

It should be noted that where an eligible consumer requires access to the distribution network, in addition to the transmission network, in order to conclude a direct supply contract with a generator, similar conflicts of interest may arise The Directive requires companies to develop non-discriminatory tariffs for use of the distribution network (Article 18) However, there is no requirement for distribution companies to unbundle their distribution wires business from the retailing of electricity to final consumers This may however be a step the HEO would want to consider The HEO could require separate accounting for the two businesses or it could go further and require the supply companies to place distribution in a separately managed and ring-fenced business We would recommend that the HEO require at least separate accounts and that this is incorporated into supply licences Such a change would clearly help the HEO develop a transparent regulatory process

3 2 2 3 *Common ownership of generation and supply*

The Minimum Change model implies an end to MVM's wholesale monopoly As we noted in Section 2 2 2 2, this leads to a potential for self-dealing between companies with ownership stakes in both generation and supply functions

At privatisation, investors in Hungary were allowed to buy stakes in a maximum of two generation and two supply companies (three of each in the case of a consortium) Currently, RWE-EVS is the only company to have interests in both supply and generation Any liberalisation measures, including the Minimum Change model, which removed MVM's monopoly on wholesale supply and allowed supply companies to contract directly with generators could therefore potentially tie these two supply companies to one generator Similarly, Bayernwerke, which could potentially gain interests in three supply companies, has also bid for the Pecs generating company

There are already restrictions on this form of vertical integration in Hungary Supply companies have a 15% "own generation" limit as a condition in their licence (Section 5 2)

There is also regulatory provision, to deal with the problem of "self dealing" Under the Electricity Act (Section 43 3), distribution companies must purchase generation at the cheapest price The tendering procedure for new generation under the EU Directive could be used to enforce this provision

Again, experience in other countries has shown structural measures to often be more effective than regulation in addressing ownership problems HEO and the Competition Agency should therefore jointly decide on the extent of common ownership they are willing to see between generation and retail companies If the authorities decide that no cross ownership is acceptable, this will need to be accompanied by a decision as to how to tackle RWE's current position, ie whether it can be accepted as part of the status quo, or whether

the company would be required to divest itself of part of the business (either outright or via a management contract)

An exception to the above is if the Minimum Change model is seen as a transitory stage to a more liberal market arrangement incorporating full retail competition As the extent of retail competition increases, self dealing becomes less of a concern (see Section 3 3) Under these circumstances, regulatory provisions may be preferred because of the flexibility they offer under changing circumstances However, in view of the fact that full retail competition is likely to be a long way off, we would recommend structural restrictions on ownership, which could always be repealed in due course

3 2 3 Public vs Private Ownership

The differences between private and state objectives may lead to tension within those firms where the government maintains a significant stake This tension is exacerbated by any increase in competition If an increase in competition means that firms can no longer recover the cost of non-competitive activities via its captive customers, they will not be prepared to participate in such activity Such tensions may arise under the Minimum Change model, and will become more acute under more liberal models

There is an additional aspect to the distinction between state and private ownership, represented by foreign state-owned companies investing in the privatised electricity sector assets In particular, EdF, the French, state-owned monopoly, currently has interests in two Hungarian supply companies To the extent that state owned firms, even when operating outside of their domestic market, have non-profit maximising objectives, this may undermine the efficiency benefits of introducing competition

There is a danger that restructuring the industry could lead to challenges from private owners, who could claim that their purchase of companies at privatisation was predicated on the existing structure As part of an appeal against the granting of a supply licence to Dunaferr, Bayernwerke, which has an ownership stake in DEDASZ, has used the argument that at privatisation it paid for the exclusive right to distribute electricity within DEDASZ' area As the extent of liberalisation increases, the scope for challenges by private owners may rise [11]

3 3 Further Liberalisation Models 2 and 3

Any liberalisation of the electricity market in Hungary which goes beyond the Minimum Change model, will continue to raise many of the same ownership issues In particular, issues of market power in generation and supply (ie horizontal integration) and cross-ownership remain relevant, and are likely to be exacerbated by further liberalisation

In a Pool Model, such as Model 2, market power in generation or demand potentially allows companies to manipulate the Pool price HEO and the Competition Agency may therefore wish to take a tougher stance on the degree of common ownership they are prepared to see

within each activity, than under Models 0 or 1 However, much depends on the details of the Pooling arrangement, and the extent to which the threat of new entry constrains participants' actions

Under a Bilateral Trading Model (such as Model 3), despatch and the settlement of imbalances would need to be independent of any trading interests It would be possible for these functions to be carried out by MVM, as long as there was no common ownership between MVM and traders in the market (ie generation, suppliers or market intermediaries) There is no conflict of interest between these functions and the ownership of transmission, although each should be managerially independent The choice of Model 3 would therefore continue to require the divestment of Paks from MVM and a prohibition on any future investor with a stake in MVM from also having interests in generation or supply

We also commented in Section 2 2 3 on the lower cost of capital and lower risk aversion of public sector companies, as a result of access to government finance As the degree of competition increases, this is likely to become a potentially more significant factor This reinforces the recommendation made in relation to Model 0 for continued progress towards either privatising or corporatising the remaining publicly owned generators

Many of the same restraints on ownership are required under Models 1, 2 and 3 (and even Model 0), if liberalisation is to result in improved efficiency The recommendations presented in Section 3 2 apply equally to the more liberal models [12] Indeed, under a more liberal regime, the implications of failing to successfully address ownership issues are more acute The weight of the recommendations is therefore even greater under Models 2 and 3

11 See companion paper covering Financial Issues, prepared by Arthur Anderson and USAID for HEO

12 The exception is cross-ownership of generation and supply companies under extended retail competition However we noted in Section 3 2 2 3 that the extension of retail competition is an additional facet to the Models currently being discussed and based on experiences in other countries, is unlikely to be introduced in Hungary in the near future

4 CONCLUSION

The rationale for liberalising the electricity market is that it leads to incentives for improved efficiency in generation, in the form of more efficient despatch, maintenance and investment However, for this to be the case there are several requirements which have to be met, which in turn imply the need for certain limitations on ownership

The paper on "Hungarian Trading Schemes" outlines four alternative liberalisation models for the Hungarian electricity sector The preceding discussion has shown that, in relation to ownership, many of the same concerns arise under the different competitive models, although they are often exacerbated as the degree of liberalisation increases In addition, to the extent that the least competitive models (Model 0 and Model 1) are seen as temporary steps on the way to a more liberal arrangement, investors may seek to build up strategic ownership stakes in advance of the introduction of competition This needs to be borne in mind when formulating a strategy towards ownership

Options for addressing ownership concerns fall into three main categories

- legal restrictions on ownership,
- unbundling (through divestiture or regulation) to establish independent ownership of different functions, and
- regulation of firms' behaviour

We have noted that in other countries the physical separation of functions has often been found to be more effective than regulation Our recommendations have therefore focused on structural solutions rather than reliance on regulation, although we have noted potential regulatory options as an alternative where feasible A summary of the recommendations made in Section 3 is presented in Table 4 1

Table 4 1
Summary of Recommendations

	Horizontal integration		Vertical Integration		Public vs Private	Foreign vs Dome
	Generation	*Supply*	*Transmission and generation/supply*	*Generation and Supply*		
Model 0	HEO and Competition Agency to develop strategy on acceptable degree of common ownership		Divestment of Paks from MVM (privatisation/lease/management contract) Prohibit future investors in MVM from owning stakes in generation or supply companies	HEO and Competition Agency to develop strategy on acceptable degree of common ownership	Privatise remaining publicly owned generators , or ensure fully corporatised	Tariffs to rise to sustainable levels
Model 1	As for Model 0, plus Consider adoption of statutory limitations on common ownership		As for Model 0, plus Add restriction in MVM s licence on owning retail business MVM's power purchase function to be managerially separated from transmission Develop transparent, non-discriminatory criteria for access to both the transmission and distribution networks	As for Model 0, plus Requirement on vertically integrated companies to keep separate accounts	As Model 0	As for Model 0
Further Liberalisation (Model 2, Model 3)	As for Model 1		As for Model 1	As for Model 1	As for Model 0	As for Model 0
	N B Suggested recommendations under Model 0 and Model 1 become <u>critical</u> under Models 2 and 3					

Financial and Public Service Obligation Issues Associated with the Opening of the Hungarian Power Sector

I 1

BACKGROUND 1

II STRANDED COST RECOVERY OPTIONS 3

A The Definition of Stranded Costs 3
1 The Recovery of Stranded Costs Caused by Increased Competition 3
2 The "Reasonable Investment Standard" 5
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INTRODUCTION

The purpose of this paper is to identify the potential financial implications of increased competition in the Hungaryian power sector under the existing legal framework and under more liberalized forms of competition that are consistent with the European Union (EU) Directive on internal market opening The paper focuses on the effects of increased competition on the recovery of fixed costs associated with existing contractual commitments between MVM, the generating companies, and supply companies These contracts were negotiated based on a statutory obligation to serve and economic regulation of a lawful monopoly In the event of initiatives to increase competition under the existing legal framework or under more liberalized market structures, the absence of transitional mechanisms under the current system of regulation may make fixed cost recovery ineffectual under existing contracts if either wholesale or retail suppliers are able to contract with alternative suppliers These potentially unrecovered costs are commonly referred to as stranded costs The paper also discusses

the elements of the current legal and market structure that can cause costs to be stranded ifs customers are granted access to the market,

alternative stranded cost recovery policies,'s compliance with the phased opening of its internal market pursuant tounder Article 19 of the Directive, and to make recommendations regarding alternative courses of action to ensure the financial integrity of the industry, compliance with EU requirements and to minimize the cost of electricity to Hungarian consumers Issues that will be considered include

the potential for the emergence of stranded costs as a result of existing contractual commitments among generators, MVM and the supply companies and the financial consequences under various stranded cost recovery optionspotential micro and macroeconomic effects,

reformation of the existing statutory obligation to serve in order to mitigate stranded costs under more competitive market structures,

the consistency of alternative stranded cost recovery options in relation to the laws and directives of the EU, and

treatment of stranded costs under alternative trading models for the Hungarian market

II THE HUNGARIAN REGULATORY FRAMEWORK APPLICABLE TO THE FINANCIAL CONSEQUENCES OF OPEN ACCESS UNDER THE EU DIRECTIVE

BACKGROUND

" Stranded costs reflect the difference between in the collective value of assets of a regulated monopoly relative to the market value when its franchised market is opened to competition In the transition to a competitive market, a company may be forced to absorb stranded costs if customers (wholesale and/or retail customers) are allowed to depart the from their historical supplier's system and avoid making payments for fixed costs incurred on their behalf either under a contractual or statutory obligation to serve If a company is unable to (1) recover stranded costs from departing customers, (2) reallocate them to its remaining customers, or (3) mitigate them through other means, it may have insufficient cash flow to meet its fixed obligations (e g , debt service and other fixed contractual obligations such as power purchase agreements) Financial markets may perceive companies with stranded cost

exposure as an increased credit risk This may cause an increase in the cost of capital and restrict access to financial markets if the cost of capital becomes excessively high In the extreme circumstances, a company's inability to recover stranded costs may lead to insolvency and bankruptcy

There areThe current regulatory system in Hungary is consistent with economic regulation of a lawful monopoly The Electricity Act imposes a statutory obligation to serve on MVM as a transporter and the single buyer and seller of electricity from the generating companies topri mary the six regional supply companies Section 42 of the Electricity Act provides that

(1) In accordance with the content of a contract produced according to subsection (2) the transporter has an obligation for providing electric energy to the supplier In the interest thereof, transporter shall survey the long-term demand of suppliers in electric energy and initiate, in due time, the extension of productive capacity and provision of imported electric energy

(2) Conditions of the co-operation between transporters and suppliers shall be set out in a contract

This service obligation is also a condition of MVM's statutory service obligation is also reflected in the conditions of its operating license Section 3 2 of MVM's license obligates it to transmit to the supply companies their electricity requirements in accordance with the terms of power purchase agreements with between each supply company and MVM Section 4 1 of the operating license requires MVM to purchase all of the electricity and secondary reserve requirements of the supply companies in fulfillment of Section 3 2 The operating license has an indefinite term

To mitigate the risk that MVM will under recover its fixed costs, Section 5 1 requires each supply company to purchase electricity from MVM to fulfill their supply obligations to retail customers pursuant to a power purchase agreement with MVM To ensure the supply companies are able to recover their fixed costs, Section 43(1) of the Electricity Act imposes a similar obligation to serve on the supply companies This obligation is also reflected in Section 3 1 of the supply company operating license The term of the supply license is indefinite

Decree 51/1995 required that demand charges in the power purchase and power supply agreements be paid on a take-or-pay basis This pricing mechanism insured recovery of demand costs irrespective of actual energy sales The current pricing decree, however, provides that demand charges be paid on the basis of metered demand, therefore the generations may be at risk to under-recovery of their fixed costs

The Electricity Act contains a pricing standard that ensures that companies operating within the power sector are precluded from exercising market power derived from their exclusive right to serve customers in defined public areas Prices are set to ensure that the supply of electricity is at minimum cost and that companies in each segment of the industry are able to recover their costs and earn a reasonable return on their investment This form of pricing is consistent with the economic regulation of a lawful monopoly Ssection 55(1) of the Electricity Act provides that

> The producerr(?), transfer, distribution and supply price (fee) of electric energy shall include the recovery of reasonable investments and the costs of the license holders' operating efficiently, as well as the profit necessary for ongoing operation

Section 55(2)(b) requires that when setting prices, consideration be given to

> Tthe requirements and factors of economic policy, energy policy, safety of supply, environment protection and international economy shall be taken into account

These provisions of the Electricity Actact neither expressly permit nor forbid the recovery of stranded costs Arguments can be developed that these provisions of the Electricity Act either permit or preclude stranded costs recovery Therefore, it may be appropriate to seek explicit statutory authority regarding stranded cost recovery to avoid litigation over the meaning of the Electricity Act in regard to stranded cost

recovery

II STRANDED COST RECOVERY OPTIONS

This section focuses on four key elements of any stranded cost recovery policy, (1) the definition of stranded costs, (2) who should bear responsibility for stranded costs, (3) how to quantify them, and (4) how they should be recovered The followingThe following sections discuss the issues and options associated with each of these elements

A The Definition of Stranded Costs

If, as a result of market opening, the, the market price of electricity is less thant the cost to generate from an individual or collective group of assets the owner(s) may incur stranded costs Stranded costs may include, but are not limited to (1) fixed costs of investment in plant and equipment (i e , return on equity, interest expense and depreciation), (2) take-or-pay fuel contracts, (3) nuclear decommissioning costs, (4) capitalized expenses for which there is an expectation regulators will permit recovery in the future, and (5) take-or-pay powerpay power purchase agreements In addition to defining stranded costs it ist is also appropriate to consider whether the circumstances that create stranded costs justify their recovery

1 The Recovery of Stranded Costs Caused by Increased Competition

Stranded costs can be incurred under the existing regulatory framework if a customer chooses to (1) self-generate or (2) purchase there their electricity requirements from direct supply licensees Stranded costs may also be incurred through ordinary business risk inherent in the existing regulatory system including customers leaving a supply company's designated service area, energy conservation, or a reduction in demand due to sluggish economic activity This raises the question of whether companies should be permitted to recover stranded costs for which they were at risk under the status quo, and for which there was no explicit authority to permit recovery This question must also be addressed if the government undertakes initiatives to enhance competition under the existing legal framework This is because the promotion of competition under the existing legal framework (e g direct supply licenses) has the potential for creating stranded costs

The existing regualtoryregulatory system also exposes the supply companies to unrecoverable stranded costs because of the asymmetrical relationship between their obligation to serve customers in designated public areas defined in their operating licenses and their customers' ability to terminate service with limited prior notice Section 45 of the Electricity Act requires supply companies to provide service to customers under either a general public utility contract or an individual public utility contract The general public utility contract is indefinitely valid, but the customer has the right to terminate service with 30 days notice An individual public utility contract is a contract between a supply company and an individual customer Section 45(6) of) of the Electricity Act provides that

> An individual public utility contract will expire on the date determined therein unless the parties have extended it The customer may cancel an individual public utility contract by the end of a year at a notice period stipulated in the contract

With respect to self-use generation,n tricity Act, Section 39 of the Electricity Act requires
At least one year before the date of planned commissioning of power plants of own use with capacities

> between 1 and 50 MWs, the party ordering the construction of the plant shall inform the supplier competent in the area about the commissioning

Therefore, subject to the size limitations of Section 39, retail customers can exit a supply company system

with as little as 1 year notice without having to pay stranded costs, in favor of self-use generation up to 50 MW Under the current regulatory structure this can only be avoided if the customer and the supply company have entered into an individual public utility contract that contains explicit stranded cost recovery provisions

Option 1 Limit Limit stranded cost recovery to those costs for which there is a direct nexus connection between market opening and the incurrence of stranded costs The departing customer should not be burdened with stranded costs unrelated to its decision to leave the system and for which the supply company was at risk under the existing regulatoryexisting regulatory system

Option 2 Treat Treat these stranded costs consistent with existing pricing practices To the extent that the price formula recommended for approval by Hungarian Energy Office (HEO) to the Ministry of Industry, Trade and Tourism (MOITT) permits stranded costs associated with existing business risk to be recovered from the remaining customers served by a supply company, they would go unrecovered until the next price adjustment

Option 3 With respect to stranded costs caused by a customer switching to a generator operating under a direct supply licensee, HEO could use its conditioning authority under Section 17(2)(g) of the Electricity Act to require that the local supply company be compensated for legitimate stranded costs associated with the issuance of a direct supply license

2 The "Reasonable Investment Standard"

As previously discussed Section 55(1) of the Electricity Act requires that prices be set at a level sufficient to provide investors "recovery of reasonable investment" and "costs of operating efficiently, as well as a profit necessary for ongoing operation" (hereinafter referred to as the "reasonable investment standard") " If it is assumed that costs that are may be stranded costs would have been found reasonably incurred and recoverable under the current system of regulation, only become stranded as a consequence of market opening, denying companies the right to recover stranded costs from customers departing the system due to market opening may conflict with Section 55(1) This principal should apply in reverse to costs that would have been disallowed under the existing system for failure to meet the reasonable investment standard

Other portions of Sectionof Section 55 of the Electricity Act may support arguments that stranded cost recovery may not be permissible There is no basis in economic theory to support stranded costs recovery on efficiency grounds Allowing stranded cost recovery isrecovery is a matter of equity or fairness in recognition that market opening fundamentally changes the rules upon which companies are obligated to make investments on behalf of customers and the customers' responsibility to pay for such investments During any transition period in which stranded costs are allowed to be recovered, it is possible that a purchaser's delivered cost of electricity, including stranded costs, may, may be temporarily higher than had it chose to remain with its historical supplier If customers choose to remain with their historical supplier to avoid payment of stranded costs, less efficient generating capacity may continue to operate Such as result could be found to be inconsistent Section 55(2)(c) of the Electricity Act requires that

Price regulation shall promote reliable electric energy supply at minimum cost, as well as the efficient utilization of producing capacities

Option 1 Conclude that Section 55 of the Electricity Act does not provide legal authority to permit the recovery of stranded costs caused by market opening If, as a matter of policy, it is determined that legitimatethat legitimate stranded costs should be recovered, it would be necessary to amend the Electricity Act to explicitly permit stranded cost recovery

Option 2 Conclude that Section 55 of the Electricity Act permits stranded cost and permit

recovery of those costs that meet the "reasonable investment standard " Disallowing stranded cost recovery based on this standard may adversely affect the financial position of those companies forced to absorb such costs Allowing customers to challenge stranded cost recovery s based on the reasonable investment standard is complicated by the fact that the initial investment in the current stock of generating plants was incurred under a centrally planned economy in which the assets were owned by the state Now, a Many of these generating plants have been totally or partially privatized The new investors did not participate in the decision making process that led to the initial capital investment in these plants The prices paid by investors to acquire these assets were presumably based on the expected future income generated by the plants based on the current system of economic regulation Therefore, any challenge to the recovery stranded costs associated with these assets as a consequence of market opening would be a challenge to the reasonableness of the purchase price (i e , the acquisition price was too high) , Permitting such a challenge could have an adverse effect on these investors fulfilling commitments to invest additional capital to refurbish or replace capacity In addition, it may discourage further private investment in subsequent rounds of privatization

Option 3 Provide companies thecompanies the option of (1) meeting the evidentiary burden of proof that its stranded costs are "reasonable" in order to receive 100 percent recovery of stranded costs, or (2) absorbing a fixed percentage of stranded costs in exchange for a presumption of reasonableness and the right to recover the remainder without challenge This approach may provide some administrative economy by avoiding the need for a public hearing to permit challenges to the reasonableness of stranded costs It would not necessarily avoid challenges from investors that the government would be renegingbe reneging on commitments entered into when the assets were privatized

Option 4 Permit stranded cost recovery without any challenge to the reasonableness of the investment for those assets already privatized prior to market opening This approach would avoid undermining commitments entered into for assets privatized prior to market opening In future tranches of state-owned assets, prospective investors should be placed on notice that their proposed purchase price should reflect the risk that stranded costs created by market opening may be challenged and disallowed, if that is the policy adopted by the government

3 Transitional Nature of Stranded Costs

Given that existing contracts (wholesale and individual public utility contracts) were not negotiated in an open market environment, it may be appropriate to grant parties to existing contracts extra-contractual rights to recover stranded costs Under market opening, contracts will presumably define the power supplier's obligation to serve and the purchaser's obligation to buy over the term of the contract A contract drafted in an open market environment should contain adequate notice of termination provisions such that the supplier would not incur additional costs on behalf of a customer for which it had no reasonable expectation to serve beyond the notice period in the contract Such a contract might also contain explicit mechanisms for stranded cost recovery in the event the buyer sought to terminate service prior to the contract expiration date By definition, new contracts that contain such provisions would preclude the creation of stranded costs

Option 1 Grant parties to existing contracts limited extra-contractual rights to existinnegotiate notice of termination and recovery stranded cost recovery provisions in contracts entered into prior to market opening Establish that contracts entered into after a specified date must contain notice of termination and stranded cost recovery provisions In the future, absent such provisions, parties to the contract would not be permitted to recovery stranded costs

Option 2 Grant parties to new contracts extra-contractual rights to recover stranded costs notwithstanding the terms of their contracts This approach will cause uncertainty in the market place to the extent contracts are unclear as to the seller's long-term planning obligation and the

buyer's cost responsibility over the life of the contract

4 Criteria for Permitting Renegotiation of Existing Contracts to Recover Stranded Costs Recovery of Stranded Costs Under the General Public Utility Contract

i Wholesale and Individual Public Utility Contracts

MVM has entered into contracts with both the supply companies and generators that contain notice of termination provisions The supply companies may have similar individual public utility contracts with retail customers If these contracts contain notice provisions, it may be reasonable to assume that the seller has no reasonable expectation of continuing to provide service to the customer beyond the notice period specified in the contract Alternatively, given the service obligation imposed under the existing market structure and the limited course of dealing between parties since the industry was disaggregated, it may be appropriate to allow recovery of stranded costs when customers exit the system, or allow the seller the opportunity to rebut the presumption that it had no reasonable expectation of providing service beyond the notice period If it were able to do so, it the seller would be permitted to recover stranded costs

Option 1 Assume the notice of termination provisions in existing contracts provide sufficient certainty that sellers have no reasonable expectation of providing service beyond the notice period and are not entitled to stranded cost recovery when customers departs the system upon the expiration of the contract To the extent there are stranded costs they would either have to be absorbed by the seller or be reallocated to the seller's remaining customers in the form of higher electricity prices

Option 2 Impose a rebuttable presumption that the seller had no reasonable expectation that the customer would continue to take service beyond the notice period If the seller demonstrates that it had a reasonable expectation that service would continue, it would be permitted to recover eligible stranded costs Failure to rebut the presumption would require the seller to either absorb stranded costs or reallocate them to its remaining customers

Option 3 Permit existing wholesale contracts and individual public utility contracts to be reopened to negotiate notice of termination provisions and stranded cost recovery provisions to ensure departing customers pay their fair share of stranded costs Given that the current regulatory framework has only been in place since the enactment of the Electricity Act in 1994, fairness dictates that the parties be allowed the opportunity to renegotiate existing contracts in anticipation of market opening

ii The General Public Utility Contract

Stranded costs associated with retail customers served under the general public utility contract that depart their supplier's system may merit different treatment Although the general public utility contract provides that customers must provide 30 days notice prior to termination of service, the notion that a supply company does not have a reasonable expectation of serving retail customers beyond a 30 day notice period is inconsistent with their its statutory obligation to service Under these circumstances, it is unlikely that costs incurred on behlafbehalf of a departing customer coulldcould be fully recovered within the 30-day notice period Therefore, supply companies should be entitled to recover stranded costs associated with departing customers who historically were served under the general public utility contract

B Who Should Bear Responsibility for Stranded Costs

1 Direct Assignment versus Broad-based Recovery

The previous discussion on the need for granting parties extra-contractual rights to renegotiate the terms of contracts to allow stranded costs to be recovered from departing customers pre-supposes that stranded costs should be directly assigned to that customer as opposed to a broad-based recovery from all users of the system The principal advantage of a broad-based recovery is that it spreads stranded cost recovery over a larger customer base and minimizes the price impact on individual customers Broad-based recovery may be justifiable in circumstances where the electricity market has ceased to operate efficiently If this is the case, it may be necessary to abrogate or reform existing contractual relationships to restore the market to equilibrium In the case of retail customers not served under individual public utility contracts, the retail service obligation may have to be modified to permit the introduction of competition and ensure reliable service for customers who choose to remain with their existing suppliers In doing so, all customers would enjoy the benefits associated with competition Therefore, it follows that all users of the system, including new market entrants whose existence is owed to such broad-based market reform, should bear their fair share of stranded costs incurred as a result of the transition

2 Wholesale versus Retail Stranded Costs

If retail customers are permitted access to the market, the supply companies may incur stranded costs in the form of unrecovered take-or-pay capacity charges owed to MVM These would be retail stranded costs those customers should compensate the supply company for its stranded costs associated with take-or-pay capacity charges owed to MVM If supply companies are permitted access to the market on behalf of their retail customers, MVM may incur stranded costs in the form of take-or-pay capacity charges owed to individual generators These would be wholesale stranded costs The supply companies should be assigned cost responsibility for MVM's stranded costs MVM in turn should compensate generating companies for their stranded costs MVM's stranded costs would be asssociatedassociated with those contracts with generators in which the contract price exceeds the market-clearing price This approach should limimtlimit the disrupiondisruption of existing contracts between MVM and the generating companies Individual generators should not be able to indirectly assign stranded costs to the supply companies that reduce their purchases from MVM, or to retail customers that reduce their purchases from the supply companies

C Quantifying Stranded Costs

Stranded costs may be calculated on an asset-by-asset basis at the generation-level At the system-wide level (i e , MVM's cost to serve the supply companies) stranded costs can be calculated based on a hypothetical cost-of-service or on the basis of lost revenues Stranded costs should be computed on a net basis regardless of the method used to quantify them Companies should be required to mitigate their stranded costs to the maximum extent practicable by reselling released capacity Stranded cost calculations should also take into affect the mitigating effects of load growth and the net proceeds from the sale of assets

Option 1 It is not a viable method for calculating retail stranded costs or wholesale stranded costs owed to MVM by the supply companies This is because capacity and energy is priced on an average cost basis

Option 2 A hypothetical cost-of-service approach would require the seller to forecast the cost of serving the customer net of mitigation for the period over which the supplier had a reasonable expectation that it would continue to serve the customer The seller would have to forecast its hypothetical costs It would also have to develop cost allocation procedures and to project the effects of mitigation This would require a true-up mechanism to ensure that both parties are made whole for any deviation between projected and actual mitigation

Option 3 The lost revenue approach quantifies the difference between the revenue the seller

would receive at present prices versus the revenue received based on the competitive market value of the capacity and energy Revenue received under the status quo could either be based on a one-time snap shot (e g , an average of revenue received from the customer over the past three years) or a true-up approach The competitive market value of the energy could be determined either by the seller's estimate of the market value of the energy or on the basis of the price of replacement power purchased by the departing customer Both the revenue streams at current prices and the competitive market value of the energy would be calculated over the period for which the seller had a reasonable expectation that it would continue to provide service The difference between the present value of each revenue stream (computed at the seller's cost of capital) would be the buyer's stranded cost The advantage to this approach is that it implicitly takes into account mitigation If the snap shot approach is used, it would avoid the need for any true-up mechanism and provide the customer greater certainty as to its stranded cost responsibility

D Price Mechanisms for Recovery of Stranded Costs

The principal consideration in establishing a pricing mechanism for recovering stranded costs is that it be transparent to the customer It should be unbundled to ensure that there is no cross-subsidization of stranded costs between departing and remaining customers, and to ensure that customers receive accurate price signal for purposes of deciding whether to remain with their historical supplier or contract with a new supplier

If there is to be broad-based recovery of stranded costs they should be recovered through a surcharge to transmission and distribution wire service If they are to be directly assigned to either the wholesale or retail customer that causes them to be incurred, they should be recovered by either a lump-sum exit fee or a surcharge on transmission and distribution wire service The customrcustomer and the supplier are permitted to negotiate whether stranded costs should be recovered through a transmission or distribution service surcharge or an exit fee

III ANALYSIS

A European Union (EU) Requirements

1 Scope of the Directive

The key provisions of the EU Directive related to stranded costs are Article 3, Article 19, and Article 24 Article 19 requires that the share of the market opening to end-use customers occur within six years based on the following consumption thresholds for end-use customers

customers with annual consumption greater than 40 gWh (including autogeneration),

all customers with annual consumption greater than 20 gWh, three years after the effective date of the Directive, and

all customers with annual consumption greater than 9 gWh, six years after the effective date of the Directive

Table 1 illustrates the share of the Hungarian market in terms of number of customers and gWh sales based on 1995 sales data and the consumption thresholds contained in the Directive

TABLE 1

Customers>40 gWh/year		Customers>20 gWh/year		Customers>9 gWh/year	
Number Customers	% of Total gWh	Number Customers	% of Total gWh	Number Customers	% of Total gWh
41	18 9	95	24 3	203	29 2

Each Member State shall have the authority to designate eligible customers subject to the requirement all customers with annual consumption in excess of 100 gWh (including auto-generators) be designated as an eligible customer There is no express prohibition on the supply companies assuming the role as an aggregator for end-use customers, but for the immediate eligibility of 100 gWh customers

2 Stranded Cost Recovery Provisions and Limitations

Article 24(1) of the Directive recognizes that companies within Member States have contractual commitments that predate the effective date of the Directive and that a transitional regime may be implemented that will permit stranded cost recovery subject to approval by the Commission Article 24(2) provides

> The transitional regime shall be of limited duration and shall be linked to the expireexpiry of the commitments or guarantees referred to in paragraph 1 Applications for a transitional regime must be notified to the Commission no later than one year after the entry into force of this Directive

In addition to the Directive, the rules on competition contained in Title V of the Treaty of Rome will be a determining factor in the Commission approving a transitional regime to recover stranded costs incurred as a result of compliance with the Directive Article 92(1) provides

> Save as otherwise provided in this Treaty, any aid granted by a Member State or through State Resources in any form whatsoever which distorts or threatens to distort competition by favouring certain undertakings or the production of certain goods shall, in so far as it affects between member States, be incompatible with the common market

Article 92(1) may also impact on the ability of Hungary to implement a stranded cost recovery mechanism that would recover stranded costs through a broad-based surcharge on transmission service to companies outside the Hungarian power sector It will also have some influence on length of any transition period over which stranded costs will be recovered

Article 3(2) of the Directive permits Member States to impose public service obligations on companies

which may relate to security, including security of supply, regularity, quality, and price of supplies and to

> environmental protection Such obligations must be clearly defined, transparent, non-discriminating and verifiable As a means of carrying out the above-mentioned public service obligations, Member States, which so wish, may introduce the implementation of long-term planning

3 Obligation to Serve

The Directive offers no guidance on how the public service obligation is to be organized other than it may be imposed through the authorization process for new generation under Article 5 (e g , through the imposition of conditions in operating licenses as is the current practice in Hungary)

Article 3 3 of the Directive allows Member States to rely on the public service obligation as grounds for not complying with Article 5 (authorization of generation), Article 6 (tendering procedures for new capacity), Article 17 (negotiated access), Article 18 (single-buyer arrangements), and Article 21 (our supply and authorization of client lines), so long as it does not inhibit trade, or "would be contrary to the

interests of the Community " Presumably, interests of the Community would include the interests of individual customers eligible for market opening under Article 19 The exemption provided for Article 3 3 of the Directive parallels Article 90(2) of the Treaty of Rome It provides that companies "entrusted with operation of services of general economic interest on having the character of a revenue producing monopoly" may be exempt so long as it is "not contrary to the interests of the Community "

As discussed in the previous section, the existing obligation to serve imposed on companies within the Hungarian power sector will be a contributing factor to the creation of any stranded cost if competition is increased Therefore, in addition to formulating transitional mechanisms to address the stranded cost issues, the existing obligations to serve must be revamped to balance the need for flexibility associated with customer choice versus ensuring the broader public interest is served by a continuous, reliable and economic electricity supply The previous section recommends that with respect to the wholesale market and customers served under individual public utility contracts the statutory obligation to serve be replaced by a contractual obligation to serve To ensure effective operation of the market and to avoid future stranded costs, contracts should contain (1) adequate notice of termination provisions, (2) stranded cost recovery provisions, (3) precise provisions of the seller's planning obligations, and (4) the seller's right to abandon service at the expiration of the contract With respect to small retail customers either not designated as eligible for market opening under Article 19 or those who choose to remain with their existing supplier, it will be necessary to establish a "universal service obligation " A surcharge applicable to all kWh moving over a supply company system would be one method of ensuring that the supply companies have the opportunity to recover costs incurred in fulfillment of this obligation

B Bankruptcy, Liquidation and Final Accounting

Should increased competition cause companies within the power sector to incur stranded costs, less than full recovery may adversely affect their financial condition In extreme situations, companies may have inadequate cash flow to meet fixed obligations rendering them insolvent A bankruptcy law exists in Hungary that permits financially distressed companies the opportunity to work with their creditors to restructure their obligations under the protection of the court While under the court's protection creditors are prevented from pursing legal remedies that are otherwise available to them under security agreements associated with their investment in the bankrupt organization Bankruptcy presents two unique issues when it involves a regulated utility The first issue is the basic question of whether the lights will go out if an electric company goes into bankruptcy The second issue is the role of the regulator in setting rates and how that affects the ability of a utility to implement a plan of reorganization that is acceptable to both it creditors and the court

1 Continuity of Electric Service in Bankruptcy

Act IL of 1991 on Bankruptcy Proceedings, Liquidation Proceedings and Final Accounting ("the Bankruptcy Act") governs the reorganization of insvolvement companies and the termination of operations by solvent companies The law provides for bankruptcy (a consensual reorganization process of insolvent companies), liquidation,r or a final accounting The Bankruptcy Act lacks provisions addressing the obligations of a debtor that has a public service obligation

Operating licenses issued by HEO expressly address the interaction of a licensee's obligations in the relative to either a bankruptcy, liquidation or final accounting Operating licenses require that HEO be notified within 8 days of the commencement and termination of a proceeding under the Bankruptcy Act The HEO may revoke a license on the initial date of a bankruptcy, liquidation or final accounting The license also provides that in the event of a bankruptcy the license holder will continue operation or another license holder shall be appointed by the HEO to perform in the place of the original license holder If these license conditions are legally enforceable, it appears that HEO has the ability to ensure the continuity of supply in the event of a bankruptcy, liquidation or final accounting However, the Electricity Act is silent with respect to HEO's authority to transfer an operating license of a licensee in bankruptcy Section 25(3)

of the Electricity Act provides that

> Until completion of the liquidation or final accounting, the activity defined in their license of operation shall be continued to the extent of secure supply The Office may appoint another license holder to maintain continuous supply

Section 25(4) provides that

> In the case of the appointment of another license holder for the period of liquidation or final accounting, the Office may oblige the former license holder to deliver it instruments necessary for continuous and safe production, transportation and supply of electricity to the license holder so appointed

Thus, a decision by HEO to appoint another licensee to operate the assets of a bankrupt license holder may conflict with the protection that the Bankruptcy Act affords a debtor seeking to reorganize its obligations to its creditors

Sections 25(1) and (2) of the Electricity Act permit HEO to modify or withdraw an operating license if the licensee operates its system in a manner that threatens the security of supply In the case of withdrawal of a license, HEO may take legal action to prohibit and terminate operations of the license holder Presumably if this would occur, HEO would issue a new license to another operator HEO's action would be consistent with its authority to ensure a safe and reliable supply of electricity However, it may be in conflict with the Bankruptcy Law because the termination of a license would adversely impact the value of the estate of the debtor while it is under court protection during the moratorium In other words, it is from the authority to under the license to operate its facilities that a debtor is able to generate value for its creditors Additionally, it is possible that HEO might find that a successor to a bankrupt license holder does not qualify for a new license thereby preventing the resolution of a liquidation or final accounting Therefore, it would be appropriate to explore the need for a legislative remedy that clarifies the authority of the HEO to act to ensure public safety relative to the courts' authority to protect the interests of the creditors of a bankrupt company vested with a public service obligation

2 Pricing Under the Electricity Act Versus the Bankruptcy Act

The ability of a company to reorganize in bankruptcy is based on its ability to produce future cash flows sufficient to meet its restructured obligations to its creditors In the case of a bankrupt entity subject to price regulation, its ability to accomplish this objective is dependent on regulators approving the necessary rates There is no provision in the Bankruptcy Law that acknowledges the Finance Minister's authority to set rates (based on HEO's recommendation) It is also unclear whether the court, in approving a bankruptcy plan, is constrained by the ratemaking provisions of the Electricity Act This issue is further complicated in Hungary because of the current practice of setting nationwide retail rates irrespective of each supply company's actual cost of service In order for a supply company to emerge from bankruptcy, it may require that the rates it charges to its customers be different than that of other supply companies Thus, in the event of a supply company bankruptcy, it may be necessary to depart from the nationwide pricing concept Therefore, it would be appropriate to explore the need for a legislative remedy that clarifies the authority of the Minister to set prices under the Electricity Act, particularly in the case of a company operating under the protection of the Bankruptcy Law

C Potential Scope of Stranded Costs Under Alternative Market Structures

The previous sections sought to identify the key issues and policy options available to address stranded created caused by the transition from a monopoly market structure to more competitive market structures This section addresses the potential scope of stranded costs that may be incurred under four alternative market structures discussed in the companion paper "Electricity Trading Models for the Hungarian Market" The four models are summarized below

Model #0 Enhanced competition under the existing legal structure This model would promote

competition in market entry for new generation through streamlined licensing procedures for direct supply licenses and licenses for renewable resources and other power plants defined by special legal rules like autogeneration

Model #1 A minimunm change model based on a single buyer and negotiated access for large industrial end-users and generators to meet the minimum requirements of the EU Directive

Model #2 A full pool-based system with wholesale and staged development of retail access

Model #3 A bilateral trading model with open access transmission and distribution and transmission scheduling coordinated by an independent system operator with bilateral trading of electricity

From the standpoint of minimizing stranded costs, Model #0 is the preferred option because it limits the customer choice to large industrial customers with respect to generation supplied by direct supply licensees Similarly, the ability of the supply companies to seek contract with suppliers other than MVM for either renewable energy or autogeneration is limited to 15 percent of their three-year average peak demand in accordance with Section 5 2(b) of the supply company operating license Based on this limitation no more than 15 percent of the wholesale market currently served by MVM would be subject to competition The extent to which any stranded costs could be recovered would depend on whether a determination is made as to whether Section 55 of the Electricity Act provides adequate authority for HEO to recommend a pricing formula to the Minister that would include a provision for stranded cost recovery

Model #1, Model # 2, and Model # 3 all are predicated on meeting the requirements of the EU Directive Therefore, at a minimum, under each model, the portion of the market that would be opened to competition that could give rise to stranded costs would initially and at a minimum be 22 percent of the current national market It would expand to 32 percent of the national market within 6 years Based on 1995 consumption levels and the annual consumption thresholds for customer eligibility, no more than 29 2 percent of the current market would actually be opened to competition

IV RECOMMENDATIONS

Given the fundamental change in market structure associated with market opening, companies should be permitted to recover only those stranded costs for which there is a direct nexus to market opening To the maximum extent practicable, financial commitments between private investors and the Hungarian government should be honored However, private investors should not be shielded from the financial consequences of business risk that is inherent in the current system of regulation Therefore, it is recommended that the following principles be given consideration in developing a stranded cost recovery policy

Parties to existing contracts should be granted extra-contractual rights to negotiate notice of termination and stranded cost recovery provisions that will permit recovery of stranded costs from customers that depart the system consistent with the provisions of Article 19 of the Directive

Because the Directive does not require the entire market to be opened, stranded costs should be directly assigned to those customers who cause them to be incurred As an alternative, it may be worth exploring whether under the market opening requirements the supply companies can be those entities designated as eligible for market opening and act as aggregators for their customers If this were permissible, all retail customers would share in the benefits of competition By doing so, stranded costs could be spread over more customers (i e , a broad-based surcharge on unbundled distribution wire service) and still be consistent with the principle of direct cost responsibility

Customers should have the choice of paying either a surcharge to transmission and distribution wire service or a lump sum exit fee Because the power sector has been disaggregated any stranded costs incurred by generators under existing contracts with MVM should be calculated on an

asset-by-asset basis Stranded costs incurred either by MVM or the supply companies should be calculated using a lost revenue method because of (1) its adminstrativeadministrative economy relative to a hypothetical cost-of-service approach, and (2) it implicityimplicitly includes the benefits of mitigation

Stranded costs should be treated as a transitional phenomenon Therefore, if there is a commitment to market opening, the government should make a public announcement of its intention and give the industry notice that any contracts entered into subsequent to that date must contain adequate notice of termination and stranded cost recovery provisions Parties to such contracts will not be granted extra-contractual relief in the future This should apply to wholesale contracts and individual public utility contracts with retail customers

Stranded costs should be computed on a net basis and companies should be required to take affirmative action to mitigate their stranded costs

The statutory obligation to serve imposed on MVM and the supply companies mandatory purchase obligation to purchase contain in their operating licenses must be reformed to facilitate market opening under Article 19 of the Directive MVM's statutory obligation to serve the supply companies should be replaced by a contractual obligation to serve This will require consideration of whether MVM should retain some residual statutory obligation for which it should be compensated or whether it is given pre-granted authority to abandon service upon the expiration of a contract

The supply companies' operating licenses should be modified to reform the mandatory purchase obligation from MVM consistent with any modifications to MVM's long-term planning obligation

PIERCE ATWOOD

ATTORNEYS

COPY

Memorandum

VIA FAX TRANSMISSION

TO: Robert Borgstrum, Howard Menaker

FROM: JWGulliver, CRConnors

RE: Hungary

DATE: August 18, 1997

Attached is the follow-up memo on regulatory changes that we promised Gabor Per our discussions with Bob, we will hold off on sending him anything further on long term contracts (since he has already has a 20+ page memorandum from us), until a further request

Howard, we assume you are getting back to him on the short bullett memo with recommendations to the Ministry on how one effectuates competitions Bob, when convenient, we would appreciate a copy of the memo you sent regarding our collective comments on the MVM principles of the proposed competition model

Thanks

JWG/cgb

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PIERCE ATWOOD
ATTORNEYS

Memorandum

VIA FAX TRANSMISSION

TO: Gabor Szörényi, Erika Németh

FROM: JWGulliver, CRConnors

cc: Howard Menaker, Robert Borgstrum, Jacquie Derosa

RE: Competition - Changes in Regulatory Structure

DATE: August 18, 1997

This memorandum follows up our extremely productive meetings in Budapest last month regarding various elements of competition At that time we discussed how the structure, focus and competencies of the regulator change as the sector structure moves toward the competitive model. We identified four principal areas of change, we note them below with a brief discussion

1 Anti-monopoly, Anti-trust, Competition - The core function of the regulator will shift from assuring fair price calculations for the monopoly players to include assuring open access of the market to all entrants, elimination of market dominance, and reduction and elimination of so-called bottlenecks, (e g , concentration of transmission access in one or a limited number of parties) Principles of anti-trust, pro-competition policies are somewhat different from economic price regulation and licensing Thus, the regulator will need to (1) gain competency in the legal and economic basis for anti-trust and competition theory and practices as applied to industries (e g , ownership limitations, market dominance and size issues, combinations of companies and vertical integration that could be inherently limiting on market activities) and (2) coordinate its activities with other relevant government agencies, especially the anti-monopoly office

2 Pools/ISO/Trading Arrangements - Competition in the generation market, and the ability to sell directly to various tiers of customers (resellers and end users) means that understanding how a power pool functions from a pricing and cash flow standpoint, as well as an operating perspective, will be extremely important to the regulator How the independent system operator actually operates the system, how it maintains its independence, how the trading is organized so that the most competition can be injected into the system, how the various "products"

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(energy, capacity, ancillary services) are identified and priced, are all key elements of the new operating system The regulator needs to understand both the pricing and flow of funds (to assure a fair, open and competitive market) and technical and operational aspects of a multi-player, largely deregulated system so as to assure system reliability and security

3 European Union Directives - As Hungary moves toward EU membership and as the EU continues its efforts to commercialize and add competition to the energy sector, a firm understanding of EU policies, both specifically with respect to energy and generally with regard to trading and competition, will be essential As with anti-monopoly issues, this is probably an area where the regulator needs both an internal competency (largely legal) and an ability to coordinate with other relevant ministries and agencies

4 Written Standards - The regulator will need to publish written standards and explanations governing the various activities within its jurisdiction, ranging from licensing to regulation of the poolco to anti-monopoly standards In a vertically integrated, or highly regulated, system, the number of participants is relatively few, new entrants are generally scarce, and the "rules" are largely known to the players Custom and usage generally suffice However, as the number of participants increases dramatically, as new entrants surface and old entrants retire and as the system moves toward EU standards, the need for clear, understandable, generally applicable, and transparent procedures becomes paramount. Thus, the regulator will be required continually to prepare accessible, written standards (reflecting public input) that can be read, accessed and understood by existing, new and potential participants These skills again will require legal, economic backgrounds as well as engineering backgrounds

In sum, restructuring in a more competitive environment causes the regulator to assume more economic and legal burdens and changes the mix of skills and competencies required It also places a premium on coordination with other agencies, since the sector is not so easily isolated from the rest of the economy

If we can provide you with any further information, please let me know

TECHNICAL AND OPERATIONAL ISSUES

D Alan Kidd Bechtel - KEMA/ECC

July, 97

TECHNICAL/OPERATIONAL KEY ISSUES

- Generation Security
- Transmission Security
- Ancillary services
- Transmission Losses
- Operational Code
- Metering

TRADING MODEL - Key Issues

• Model Nos.	0 1 2 3
• Gen. Security	Capacity/Imbalance Energy
• Tra. Security	Capacity/Outage Coord
• Anc. Services	Discrimination/Unbundling
• Trans. Losses	Unbundling/Cost allocation
• Op. Code	Resources for revisions
• Metering	Data collection/management

SEPARATE or COMBINED?
'System Operation' & 'Wires'

- Not definitively established anywhere in world - both arrangements work
- Costs relatively small so not an issue
- Certain functions naturally go together
- Need to analyse risks and benefits of a split
- Current structure has OVT and OVIT split under MVM Group ownership

ANALYSIS

- Too early to be specific
- Operations can always be made to fit market requirements
- Need to balance operational problems with economic theory
- Unbundling Ancillary Services is the most demanding
- Level of unbundling and regulatory control needs analysis

CONCLUSIONS

- DSM and market incentives will affect generation security
- Pragmatic development of Ancillary Services is to be recommended
- Combined 'System Operations' and 'Wires' functions may be best for Hungary
- Transmission losses are emotive, expensive and difficult
- Operational Code will need significant development and resource commitment
- Metering may be on critical path

FINANCIAL AND SERVICE OBLIGATION ISSUES ASSOCIATED WITH MARKET OPENING

Prepared for the Hungarian Energy Office

July 23, 1997

INTRODUCTION

- Stranded costs--reflect the difference between the market value and book value of assets owned by a monopoly when its market is opened to competition

- During the transition to competition, a company may be forced to absorb stranded costs if sales customers converting to open access depart without compensating their historical supplier for fixed costs incurred on their behalf under an obligation to serve

- Two-fold regulatory objective
  - Implement transitional mechanisms to address stranded cost recovery that balances competing interests of minimizing rates to customers and ensuring the financial integrity of the industry
  - Reform the market structure and obligation to serve to preclude creation of stranded costs in a competitive market

LEGAL AND REGULATORY STRUCTURE THAT GIVES RISE TO STRANDED COSTS

- Regulation of lawful monopoly gives rise to investment that may be stranded as a result of customer choice in a competitive environment
- Obligation to serve in exchange for profit regulation
  - Exclusive service area, and mandatory purchase obligations secure revenue stream for fixed cost recovery
- In spite of privatization and functional separation, Hungarian power sector is still a monopoly

Electricity Act

- Section 42 MVM supply obligation
- Section 43 supply company retail obligation
- Section 45 public utility contract (general and individual)
- Section 55 Pricing -profit on "reasonable investment"

HEO Regulation

- MVM operating license indefinite obligation to serve
- supply company retail obligation to serve and mandatory purchase obligation
- Decree 51 take-or-pay pricing for capacity

DEFINITION OF STRANDED COSTS

COST ELEMENTS

- Investment in plant and equipment
- Take-or-pay fuel contract
- Capitalized expenses
- Nuclear decommissioning expenses
- Take-or-pay power purchase agreements

ELIGIBILITY CRITERIA

- Require a connection between market opening and stranded Costs versus Ordinary Business Risk
- Section 55 "Reasonable Investment Standard"--implications for privatized assets
- Transitional nature of stranded costs--reform of the obligation to serve
- Renegotiation of existing contracts--notice of termination/rebuttable presumption

WHO SHOULD BEAR COST RESPONSIBILITY

- Direct Assignment versus Broad-Based Recovery
  - Cost causation and cost-responsibility
  - Impetus for reform
    - Market-failure and sweeping reform
    - Phased implementation to minimize disruption--absence of market failure
- Wholesale versus Retail

EU REQUIREMENTS

- Article 19 phased market opening
- Article 24(1) permits transitional regime subject to Commission approval
- Article 3 permits imposition of public service obligation so long as it "isn't contrary to the interests of the Community"
- Treaty of Rome Rules on Competition
  - Article 92(1) may place constraints on stranded cost recovery (assignment and duration)

POTENTIAL STRANDED COST EXPOSURE

Model #0	Does not fulfill minimum market opening requirements of EU Directive Supply company license conditions limit alternative sources of supply to no more than 15 percent of peak demand Promotion of direct supply licenses and renewables will limit benefits of competition to large industrial customers
Model #1	Intended to meet the minimum requirements of the EU Directive Based on 1995 data no more than 29 2 percent of the Hungarian market would be open to competition based on the phased implementation required by the Directive Competition will be limited to generators and large industrials
Model #2	Intended to meet the minimum requirements of the EU Directive The potential for stranded costs beyond that caused by compliance with the Directive will be determined by how much of the retail market will be opened to stranded costs and the extent to which intermediaries develop to aggregate small customers' load
Model #3	Same as Above

RECOMMENDATIONS AND ISSUES CONSIDER

ISSUES

- Interplay of Bankruptcy Act and public service obligations of Electricity Act
  - -HEO Authority to set prices when Debtor is under moratorium
  - - HEO Authority to revoke Debtor's licenses to preserve public interest (safety, reliability)
- Quantification of stranded costs and rate impacts
  - -Asset by Asset
  - - Hypothetical Cost of Service
  - - Lost Revenues
- Recovery Options
  - -Direct Assignment (Lump-sum fee of wires charge)
  - - Broad-based Surcharge

RECOMMENDATIONS

- Grant extra-contractual rights to modify existing contracts
- Direct assignment of stranded costs consistent with Article 19 phased opening
- Stranded costs be defined as transitional
- Modify statutory and operating license obligation to service including pre-granted abandonment for contractual services
- Establish universal retail service obligation with non-by passable surcharge to consumers
- Seek legislative clarification of HEO's authority over a bankrupt licensee

What Competitors Do You Allow? Illustrating the Range of the Competition Dimension

- In Generation
  - Development and Purchase from generating companies via Authorization and Tendering
  - Development from generating companies via Authorization and Open Merchant Buying
- In Wholesale Markets
  - Only Generators and Buyer(s) for End Users Via Single Buyer Scheme (Distributors and Direct)
  - Only Generators and Buyer(s) for End Users Via Bilateral Trading (Distributors and Direct)
  - Generators, Buyers, and Intermediaries Via Bilateral Trading (Wholesale Power Marketers)
- In Transmission
  - Only Monopoly,Unbundling of Transmission Rates and Ancillary Services
  - Independent System Operation with Independent Development
- In Retail Marketing and Supply
  - Supply Companies Only, Distribution and Energy Rates Unbundled
  - Supply Companies and Generators Selling to Limited End Users
  - Retail Marketers, Supply Companies, and Generators Selling to End Users

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Simplifying the Choices: Alternative Models

- Status Quo
- Model #0: Increased Competition Within Existing Legal Structure
- Model #1. Minimum Change to Meet EU / Single Buyer
- Model #2· The 'POOL' Model
- Model #3: Bilateral Trading

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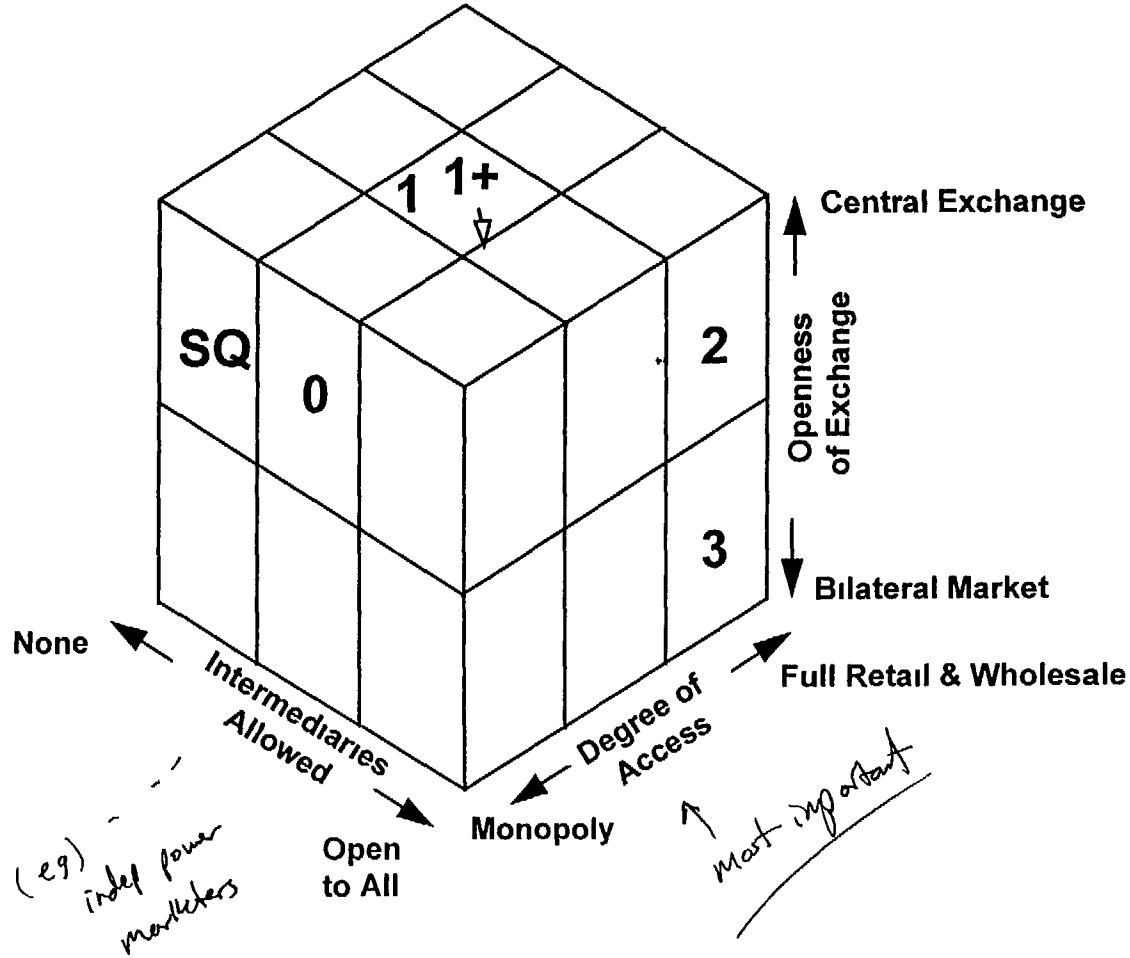
Classification of Models:

- Key Attribute — Degree of Access for Wholesale then Large Customers
- Second Key Attribute — Role of Intermediaries in Physical & Financial Trading
- Third Attribute — Central Exchange (Poolco) or Bilateral Market



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Interests of Market Participants

	Economic Growth & Competitive Infrastructure	Jobs	Breadth of Competition	Low Prices	Cost of Implement-ation
Government	✓	✓	✓	✓	✓
MVM					✓
Supply Cos				✓	✓
Generators					✓
Electric Industry Unions	✓	✓			
Large Users	✓		✓	✓	
Small Users	✓		✓	✓	

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Potential Impact of Models on Interests of Participants

	Economic Growth & Competitive Infrastructure	Jobs	Breadth of Competition	Low Prices	Cost of Implement-ation
Status Quo	0	0	0	0	0
Model #0 Increased Competition Under Existing Law	0	-1 in EI; +1 Econ	1	1	-1
Model #1 Minimum Change / Single Buyer	1	-2 EI; +2 Econ	2	2	-2
Model #2 Pool Trading	3	-3 EI +3 Econ	3	3	-4
Model #3 Bilateral Trading	3	-3 EI +3 Econ	3.5	4	-3

EI = Electric Industry Impact, Econ = Economy Wide Impact

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HUNGARIAN COMPETITION STUDY

THE REGULATORY AGENCY

Budapest, Hungary

July 1997

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The Existing HEO

Regulates Electric Market With Limited Competition

Responsibilities Include:

- Planning
- Licensing
- Limited Pricing Authority
- Technical Operations Standards
- Consumer Complaints and Dispute Resolution

Probable Changes In Structure of Hungarian Electric Industry

- Hungary Seeks Benefits of Privatization and Competition
- EU Directive
  - Liberalization of Electricity Sector
  - Phased Introduction of Direct Access
  - Government/Regulatory Decisions Must Be Objective, Transparent and Non-Discriminatory
- Investor Requirements: Regularity and Predictability

Regulation Must Change To Reflect Competitive Market

- Change From Direct Price Regulation To Market Referee
- Anti-Monopoly Concerns
  - Horizontal Integration
  - Market Dominance
  - Vertical Integration
  - Cross-Subsidization
- Increased Need For Agency Expertise In Economics And Law

The Future HEO

Regulating A More Competitive Market

HEO generally needs greater independence and more clearly defined procedures to ensure that decisions are objective, transparent and non-discriminatory. Some changes require amending existing law, others do not

Recommendations That Require Changes To Existing Law

- Multi-Member Board with Staggered, Fixed Terms
- Power to Issue Binding Decrees
- Clearer Definition of Functions of Agencies
- Separation of HEO from MOITT
- HEO Decisions Appealed Directly to Court (Not MOITT)

The Future HEO

Recommendations That May Not Require Changes To Existing Law

- Control of Fees and Budget
  - Larger Staff with Increased Expertise in Economics and Law
- Establish Rules for Processing Applications
  - Hearing Process
  - Formalized Communications/Prohibit Ex Parte Contacts
- Coordination With Competition Office

Ownership and Competition in the Hungarian Electricity Industry

NERA
for USAID

Budapest, 22 July 1997

Ownership & liberalisation

- Ownership affects incentives

=> ownership issues are important in determining whether liberalisation results in expected efficiency benefits

=>ownership structure becomes more important as competition increases

Horizontal integration	Major concern -	Market power
Vertical integration	Major concerns -	Conflicts of interest Self-dealing

Options for addressing ownership concerns

- Legal restrictions
  eg MVM prohibited from acquiring more generation

- Unbundling
  eg divestment of Paks by MVM

- Regulation of behaviour
  eg MVM to buy power at lowest price

OWNERSHIP

~~Physical~~ separation often more effective than regulation by agency (regulate by structure rather than by conduct)

Model O: Enhanced Status Quo

Limited competition => limited ownership concerns

Main current concern

- MVM's ownership of generation and transmission

BUT

Companies may build up strategic ownership stakes in anticipation of liberalisation

- HEO and Competition Agency need to develop strategy on acceptable degree of common ownership (horizontal and vertical)

coordination necessary

Model 1: Minimum change compatible with EU directive

Single buyer model

Restricted competition => raises more ownership concerns

- Concerns with both horizontal and vertical integration

- Requirement for system access
  => conflict of interest between ownership of transmission and generation/retailing

  => implications for MVM privatisation options

- End of MVM's wholesale monopoly
  => potential for self-dealing if companies own both generation and retail interests

bulk power purchase issue - ownership of the sizgle buyer -

does EU Directive require bulk power purchaser (buyer) to be separate (in ownership) from transmission co - probably not
— "chinese wall" may be sufficient —

Further liberalisation: Models 2 & 3

As competition increases, ownership concerns intensify

Examples of concerns:

- Future investors in MVM should not also hold significant generation or retail interests (25%?)
- RWE currently owns both generation and retailing interests
- Private generators competing with publicly owned generators

Key recommendations

	Horizontal integration		Vertical integration		Public vs Private	Foreign vs Domestic
	Generation	*Supply*	*Transmission and generation/supply*	*Generation and Supply*		
Model 0	HEO and Competition Agency to develop strategy on acceptable degree of common ownership		Divestment of Paks from MVM (privatisation/lease/management contract) Prohibit future investors in MVM from owning stakes in generation or supply companies MVM to keep separate accounts for transmission and generation	HEO and Competition Agency to develop strategy on acceptable degree of common ownership	Privatise remaining publicly owned generators, or ensure ~~endure~~ fully corporatised	Tariffs to rise towards sustainable levels
Model 1	As for Model 0, plus Consider adoption of statutory limitations on common ownership		As for Model 0, plus Add restriction in MVM's licence on owning retail business MVM s power purchase function to be managenally separated from transmission Develop transparent, non-discriminatory criteria for system access	As for Model 0 plus Requirement on vertically integrated companies to keep separate accounts + managerially separated	As Model 0	As for Model 0
Further Liberalisation (Model 2, Model 3)	As for Model 1		As for Model 1	As for Model 1	As for Model 0	As for Model 0
			N B Suggested recommendations under Model 0 and Model 1 become <u>critical</u> under Models 2 and 3			