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Licensing/Competition Committee

Issue Papers

- **Measuring Electric and Natural Gas Supply**
- **Developing Competition in Electricity and Natural Gas Wholesale and Retail Markets – The Changing Role**
- **What we have learned from our Licensing / Monitoring practices?**
- **Electricity Trade and the Role of Regulator**
- **Operational Models in CEE/Eurasia**

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ENERGY REGULATORS
REGIONAL ASSOCIATION

Fourth Annual Energy Regulatory Conference
Central/Eastern Europe & Eurasia

December 11-13, 2000
Bucharest, Romania

Dear Colleague:

As Chairman of the Licensing/Competition Committee of the 1st, 2nd, 3rd and 4th Annual Energy Regulatory Conference for Central/Eastern Europe and Eurasia, I am pleased to present the third block of Issue Papers – an occasional series on licensing energy activities in nations with transitional economies. The Licensing/Competition Committee was designed to encourage information sharing between newly established energy regulatory commissions in the region. Over the three years of its existence, we dare to say that the Committee's work has proved to be effective and constructive.

During the year 2000, two new regulatory authorities joined our Committee: the Electricity Regulatory Authority of Albania and the State Energy Regulatory Commission of Bulgaria. To date there are fifteen countries represented in our team: Albania, Armenia, Bulgaria, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Poland, Romania, Russia and Ukraine. Hopefully, this number will increase in the future.

The members of the Licensing/Competition Committee met on two occasions in 2000 to discuss licensing issues that are specific to the region and to nations with transitional economies. The enclosed *Technical Paper #1: Measuring Electric and Natural Gas Supply Service Quality and Providing Incentives* for Improvement represents a crucial element of licensing/monitoring activities. The review "*What have we learned from our licensing/monitoring activities*" summarizes our licensing/monitoring activities and helps us to learn from each other. The third paper *Issue Paper #2: Developing Competition in Electricity and Natural Gas Wholesale and Retail Markets* is the very first competition paper produced by the Committee and supposed to be the first element of our new series related to competition from the regulators' point of view.

I personally have to acknowledge that the staff of the Hungarian Energy Office has learnt a great deal from fellow regulators, foreign commissioners over these three years and we hope it has been an interactive experience.

I would like to thank all the participating members of the Licensing/Competition Committee, USAID, the United States National Association of Regulatory Utility Commissioners for the continuous work and assistance they have been providing us in developing the papers. I look forward to continuing our work over the next year.

Sincerely,

Szörényi Gábor

Dr. Gábor Szörényi
Deputy Director, Hungarian Energy Office
and Chair of the Licensing/Competition Committee

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SERIES OF LICENSING AND COMPETITION RELATED ISSUE PAPERS

PAPER NO. 1
MEASURING ELECTRIC AND NATURAL GAS SUPPLY/SERVICE QUALITY AND PROVIDING INCENTIVES FOR IMPROVEMENT

Prepared by
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LICENSING/COMPETITION COMMITTEE PAPER NO. 1
MEASURING ELECTRIC AND NATURAL GAS SUPPLY/SERVICE QUALITY AND PROVIDING INCENTIVES FOR IMPROVEMENT

1. Preface

1.1 A major objective of Energy Regulators is maintenance or enhancement of service quality. This purpose is embedded in statutes which establish and define the jurisdiction of most Energy Regulators. The economic principle enforced is that, in return for government protected monopoly status, an enterprise is required to provide reasonable and adequate service at a reasonable cost. The Energy Regulator establishes rates at a reasonable level, and in return requires reasonable and adequate service.

1.2 This paper focuses upon recent developments in the methods used by Energy Regulators to measure and assure the quality of electric and natural gas supply or distribution service. These methods involve the provision of incentives to service providers, especially privately owned service providers, to improve or maintain existing satisfactory service quality.

1.3 This paper provides an introduction to these new incentive methods for enhancing and maintaining service quality. Drawing from the experience of the two countries in CEE/Eurasia which have already implemented programs employing these methods as well as experience from North America and Europe, Committee Members will be advised of the major elements needed to successfully develop such incentive programs; including the reasons and objectives supporting adoption of such programs, necessary data gathering and evaluation procedures and specific service standards which have been adopted.

Also discussed is the experience of the Kyrgyz Republic, in which power quality standards are being developed and included in Supplier/User power agreements. Unlike the incentive programs described above, these standards apply to a service which in North America and Europe is to be provided by market competition. Although service quality standards may be included in private market agreements, North American Regulators do not regulate the supply service once competitive markets have been established, and thus would generally not have the authority and would not impose supply quality standards or related incentive programs.

1.4 The Appendix attached to this paper sets forth a Glossary defining essential terms employed in the development of service quality enhancement programs (Item 1). Appendix Item 2 describes in further detail the experiences and programs of Hungary, Romania and the Kyrgyz Republic in the design and implementation of these programs. Finally, Appendix Item 3 describes programs in effect in the United States and several European countries (Great Britain, Spain and Norway). As there described and in paragraphs below, service quality enhancement programs address the number and total duration of supply interruptions, reasonable time periods for response to customer inquiries and other matters important to maintaining a positive

relationship with customers and certain safety related matters. This information is provided to assist Committee Members in developing their knowledge of these programs both to facilitate their discussion by the Committee and in the implementation of these programs where desirable within the Region.

1.5 A summary of Committee Member Comments upon these programs made at the October Committee Meeting is provided in Section 7 of the paper.

2. Traditional Energy Regulator Approaches to Assuring or Maintaining Adequate Service Quality

2.1 In CEE/Eurasia, assurance of adequate electric and natural gas service quality has been obtained by Ministries establishing quality standards for such service. These standards form a basis for or are included in formal regulations adopted by the Regulator or an Energy Ministry organization, such as Gosenergonadzor which may also establish the quality standard itself, which standards the provider of power supply and distribution services to customers must comply with. If a service provider fails to maintain the required service quality, it may be fined or incur other penalties imposed by the Regulator or Ministry pursuant to provisions contained in the Country's Civil Code or other laws.

2.2 In North America and some European countries, the obligation to provide adequate and reasonable service was enforced by a combination of Customer Complaints filed with and adjudicated by the Regulator and incentives or penalties assessed in rate proceedings (i.e. reduced or enhanced capital return allowances) to encourage or enable improvement of service operations. What constituted "adequate and reasonable service quality" was obtained from industry developed guidelines or was defined by the Regulator in consultation with service providers and consumer representatives.

3. Changes in Regulator Philosophy or in the Markets for Electric and Natural Gas Supply that have or may Encourage the Adoption of Incentive Programs to Enhance or Maintain Service Quality

3.1 There have been three changes in philosophy or in electric and natural gas supply markets which have led Energy Regulators to adopt incentive mechanisms as a means of assuring or improving service quality.

3.2 First, many Energy Regulators have implemented incentive or performance based rate making to achieve increased efficiency in electric operations and reduced electric or natural gas service costs. Under this form of rate making, the Regulator does not regulate individual cost elements as in cost of service rate making, but rather establishes an overall reasonable price for service, permitting the utility to retain a part of any cost reductions from costs employed in its price determination due to increases in efficiency as additional profit. However, in adopting this form of rate regulation, the Regulator must have a means of assuring that the cost reductions for which the service provider is rewarded are not simply the result of reducing resource outlays

needed to maintain service quality, but rather reflect the desired increased efficiencies of operation. The strengthened measurement and reporting systems and financial incentives to improved service quality provide this assurance.

Regulators who have adopted performance based rate and service quality incentive programs generally believe that incentives are more effective than Regulator mandates alone in achieving cost reductions or service quality improvements for Ratepayers. Mandates are only effective where the Regulator can determine that a cost reduction or service quality improvement is possible, while incentives encourage service provider management who may be more knowledgeable of service operations to identify and implement possibilities of which it has knowledge or which can be developed through cost-effective investments.

3.3 Second, many Governments have implemented competition in principally the supply or metering and billing functions of the electric or natural gas markets also to achieve reduced electric or natural gas service costs. Enhanced service quality measurement, reporting and incentive mechanisms applicable to remaining monopoly services, and principally to distribution service, provide a means of assuring that this new focus upon competition in the supply marketplace will not cause reductions in the quality of traditional and remaining monopoly services as might happen if management attention and resources is diverted more heavily to achieve corporate objectives in the new competitive markets.

3.4 Third, many Governments or Regulators, in response to privatization or sale of electric or natural gas assets by the traditional supplier, in order to assure that change in ownership or management does not result in a reduction in service quality, are imposing enhanced measurement and reporting requirements and incentive mechanisms.

3.5 In CEE/Eurasia, service quality standards and system investment requirements imposed as a part of the Agreement of Sale of formally government-owned assets (i.e. during privatization) may each serve the purpose of maintaining or improving existing service quality. The former is generally preferred as it addressed directly the concern with service quality, and leaves to the new owner the decision as to how the required service quality will be achieved. During privatization, service quality standards are often imposed as license conditions upon the new private owners of electric or natural gas properties and are made the subject of penalty payments for non-attainment.

4. Fundamental Issues to be Addressed in Designing and before Implementing an Enhanced Service Quality Program

4.1 In designing and before implementing an Incentive Service Quality Program, the Energy Regulator must resolve a number of **fundamental issues** as follows:

a. What is an "adequate and reasonable" level of service quality? How does the Regulator identify that needed or customer desired level of service quality? Should all service interruptions be included in determining the required level or should interruptions due to unusual, non-annual events (generally major storms) be excluded?

b. Can Regional Service Quality Standards be adopted or, because of the diversity in utility service territories and equipment, must service quality standards be set principally on the basis of matching or exceeding a utility's past service record?

c. How will the Regulator measure whether the required level of service quality is being satisfied or not in order to make incentive or impose penalty payments?

d. At what level should financial incentives and penalties be established to maximize the opportunity to achieve Regulator objectives without creating "perverse" incentives?

e. What are the specific measures of service quality that the Regulator should include within the program?

f. What procedures can or should an Energy Regulator adopt to efficiently collect and evaluate the information required to define the desired service quality standards, including permitting needed input from consumer and service provider representatives.

4.2 **Developing Reasonable and Adequate Service Quality Standards.** Energy Regulators have defined reasonable and adequate service as being that service which customers consider cost effective. Targeted customer surveys conducted by independent researchers and validated by statistical analysis are often used in part to answer this question, as are available industry standards and consultation with consumer representatives and service providers. Both major European and North American programs perform some "normalization" of experienced data in both establishing and monitoring compliance with service quality standards, but there are some programs who do not though they do not apply financial incentives to the non-normalized data. Those Regulators who do normalize argue that this procedure is essential to permit a fair program since abnormal, primarily weather caused events occur only sporadically and should not be allowed to determine whether financial incentives are paid. Service outages caused by events non controllable by the service provider (i.e. such as transmission caused events where the standard is to apply to a distribution service provider) are also generally eliminated from standard development.

4.3 **Regional versus Service Provider Specific Standards.** Although Regulators show interest in establishing regional standards which permit comparability of performance between service providers, at least in the United States most Regulators have dismissed this approach for now and rather base their required performance standards upon the service provider matching or exceeding his past service quality performance. Significant differences in the amount of overhead versus underground lines and cables, density of populations or vegetation (principally trees) in service areas, weather, topography and other factors have led North American Regulators to adopt, at this time, primarily service provider specific standards. A desire to obtain experience with the application of such standards and their related incentives to designing regional approaches has also contributed to this decision. North American Commissions have also typically required that service standards be based upon four or more years of performance data which has been evaluated for accuracy and consistency prior to implementing a financial incentives mechanism.

The concept of a "regional" rather than "utility specific" standard as it is being discussed in the United States is to define service quality standards which can be applied uniformly across

several utility service territories or states. The concept applies primarily to the number and duration of service interruptions. The benefit of regional versus utility specific standards is that the data employed in defining and applying the standard is not limited to the service quality achieved by a single service provider management, but rather would reflect the success achieved by different management approaches and emphasis to service quality matters. "Regional" standard concepts are already being applied, in the United States and Spain, in the concept of establishing separate standards for service areas with different customer densities, rural versus urban settings and related matters which affect the number and duration of service outages. However, sufficient data and experience have yet to be developed with these programs to permit the establishment of broad multi-state standards either in Europe or the United States. Regional standard concepts may have greater application to CEE/Eurasia countries in that their present utility systems were largely all constructed and operated for many years by the Government, whereas in the United states different private utilities have constructed and operated separate systems based on somewhat different engineering, reliability and cost-benefit judgments. These differences could give rise to significant differences in number and duration of service outages.

4.4 **Service Standard Data Reporting.** Energy Regulators have required the establishment of thorough and uniform data collection and reporting systems prior to establishing standards and implementing financial incentives and penalties. Such reporting may include event reports upon the occurrence of significant service interruptions, annual reports compiling service interruption and other data measuring compliance with or upon the basis of which the standards are adopted (i.e. for example, customer inquiry response times) and special data collection investigations preliminary to standard adoption. Regulators have noted that the availability of uniform and accurate data is essential both to standard development and to assuring fairness and effectiveness of the financial incentives in achieving real service quality improvement. Many service quality programs provide for independent audit of the reported data upon the basis of which financial incentives are to be paid. In discussion, Committee Members with experience in the operation of service quality programs emphasized the need to audit the data upon which the standards are based and upon which incentive or penalty payments are made. It was recommended that auditing procedures and guidelines be defined prior to program implementation and be included in all programs.

4.5 **Establishing the Magnitude of Penalties and Incentives.** Energy Regulators in the United States and Europe have stated that financial incentives should be set based upon the value that customers would place upon attaining the service quality improvement sought. A payment or penalty set above that level creates perverse incentives as the service provider is encouraged to allocate resources away from more consumer valued activities to obtain the targeted service quality improvement and the incentive payment (or avoid a penalty). In the United States, many programs only impose penalties (i.e. no rewards can be earned) since the required service quality level is based upon a matching or modest improvement of the service provider's historic experience and Regulators believe that the provider should not be rewarded for matching or modest service quality improvements. An additional issue which must be resolved is whether symmetrical incentive/penalty imposition mechanisms, deadbands and a collar which limits the maximum penalty or incentive are to be imposed. (See Appendix Item 1 for definitions) Most

European and North American programs impose deadbands and collars or maximum incentives/penalties, but there is disagreement over whether incentives should be symmetrical or should be more heavily weighted toward penalties based on the fact that the service provider is more familiar than the Regulator with the equipment, operations and likely service quality results which will be achieved under the program.

The adoption of deadbands assures that neither incentive nor penalty is paid unless significant improvement or inadequacies in service quality are experienced. The cost of service quality penalty payments are not permitted recovery in ratepayer rate levels in order that the penalty be imposed as intended on the service provider. An issue presently being debated in Europe and North America is whether payments made to individual customers due to service provider failure to achieve service standards applicable to the individual customer should be paid automatically or only upon application of the customer. Experience has shown that requiring application by the customer to receive the payment requires delay in payment and may result in non-payment if the customer neglects to apply.

4.6 **Specific Service Quality Standards Adopted.** Both North American and European Regulators have stated that service quality standards and related incentive mechanisms can only be applied to matters which are within the control of the service provider, and that the standards must measure matters which are capable of objective measurement over time and across companies. Otherwise, the standards and incentives can serve no useful purpose and will likely simply burden ratepayers with unnecessary payments as the desired efficiency improvements are either not within the ability of the service providers to obtain or their presence cannot be verified. Specific standards adopted by CEE, European and North American Regulators are discussed in Section 5 below.

4.7 **Process for Adopting Service Quality Incentive Programs.** Energy Regulators typically adopt service quality standards and financial incentives only after extensive data collection and verification to permit an accurate understanding of both current service quality levels and what is required to obtain cost-effective improvements. Both Consumer Representatives and Service Providers are consulted to assure that their views on needed service improvements, the value customers would assign to such improvements and achievable, cost-effective improvements are fully understood. Procedures employed in the United Sates are typically informal (i.e. no or limited formal evidentiary hearings), including primarily a legislative rulemaking procedure (i.e. written comments upon proposed Regulator positions) and informal working group sessions with interested parties. In discussion, Committee Members with experience in implementation of service quality programs urged that the Regulator consult fully with both Service Provider and Customer Representatives on the specific program they intended to propose, and particularly that care be taken to determine that customers desire and will pay the costs of increased service quality.

4.8 Appendix Items 2 & 3 contain a more detailed description of how the Hungarian, Romanian, North American and European Regulators have resolved these and lesser

implementation issues in their application of incentive mechanisms to achieve service quality improvement.

5. The Specific Elements of a Service Quality Incentive Program

5.1 **European and CEE Programs** typically include six to twelve Guaranteed Standards and eight to fourteen Overall Standards of Service Quality Performance. Guaranteed Standards relate directly to an individual customer's service and payments are made to the customer if these standards are not satisfied. Overall Standards relate to broader service to all customers or customers in specific operating divisions to which the standards are applied separately. **North American Programs** typically include standards respecting service reliability and availability, consumer service contacts and safety. North American programs may also provide for direct payments to customers where standards applicable to an individual customer are not complied with, but do not generally use the terms "Guaranteed Standards" or "Overall Standards". Many North American programs also include financial incentives (both rewards and penalties or penalties only) for broader, system-wide standards though several do not. Financial incentives may not initially be applied in these programs either because of concerns over the accuracy of data, the effectiveness of monitoring mechanisms or a desire to phase full program implementation in over a several year period (i.e. data collection and monitoring) and to gain experience before according them financial effect. Service Quality Incentive Standards may be set forth in Licenses or in separate regulations adopted by the Regulator.

5.2 **Guaranteed Performance Standards** adopted in CEE, Europe and North America have included the following:

(i) time period required for restoration of power to a customer from a planned or unplanned service interruption;

(ii) time period for a service provider representative to appear at the customer's premises to correct a service interruption or safety problem after customer request (including repair of a prepayment meter);

(iii) a worst served customer standard of no more than X sustained interruptions each year;

(iv) time required for a live person to answer a telephone call to the service provider's customer assistance facility and to begin a substantive discussion of the reason for the customer's call (i.e. primarily service interruption complaint or metering/billing dispute);

(v) time period required to connect a new customer, to resite a meter or to evaluate a meter's accuracy at customer request;

(vi) time period to respond to consumer written inquiries upon any matter;

(vii) presentation to the customer of cost or completion estimates of service or other repair activities within specified time periods; and

(viii) keeping appointments made with customers within any agreed time interval.

5.3 **Overall Standards of Performance** adopted in CEE, Europe and North America have included:

(i) standards limiting the number and cumulative duration of service interruptions experienced by an average customer (i.e. the SAIDI, SAIFI, CAIDI and MAIFI indices defined in Appendix Item 1);

(ii) standards limiting the time period for restoration of supply to the average customer from planned and unplanned outages;

(iii) standards limiting the number of verified voltage complaints and the number of instances in which voltage not conforming to standards is not corrected within a specified time period;

(iv) number of breakdowns on middle and high voltage lines and cables per 100 KM;

(v) telephone response time and busy signals encountered by customers with billing, service interruption or other inquiries;

(vi) required time period for reply to customer inquiries or requests for service such as meter accuracy testing or new connections;

(vii) number of customer complaints relating to metering or billing, the number of such complaints found to be justified and the time period required for their resolution; and

(viii) reconnection of customers disconnected for non-payment upon payment or agreement as to a payment plan within a specified short time period.

5.4 Hungary and Romania have each adopted an incentive program designed to enhance distribution service quality. The Hungarian Energy Office evaluates reports which it requires made by service providers of the causes of major service outages, periodically assesses consumer satisfaction with service quality and has adopted for electric distribution service and is developing for natural gas service both Guaranteed and Overall Standards of Performance. Hungary has employed a performance based rate (i.e. a rate cap) since 1997 under which an incentive may exist to permit service deterioration unless appropriate service quality standards are enforced. Service Providers must pay $3.50 to the customer for each violation of the Guaranteed Standards of Performance. In 1999, four of six service providers were required to pay penalties on account of failure to meet required Overall Service Standards.

The Romanian National Energy Regulatory Authority has implemented this year guaranteed performance indicators and general performance indicators applicable to electric distribution and supply service. These standards establish the minimal performance to be meet by service providers in their relationship with consumers. Specific matters as to which standards have been adopted include the frequency of supply outages, the time required to restore supply after an outage, time required to respond to various customer inquiries and number of billing and metering complaints. ANRE is implementing the standards gradually by not imposing penalties for non-compliance during their first year of effectiveness.
Details of the Hungarian and Romanian service quality program are provided at Appendices 2A and 2B.

5.5 The State Energy Agency of the Kyrgyz Republic has developed service quality standards applicable to electric generation licensees, natural gas suppliers and central heating plants. The Kyrgyz Republic, as a member of the Intergovernmental Board for Metrology Standardization and Certification, has adopted the latter's Norm Gost 13109-97, "Power Quality

Specifications for General-Purpose Power Supply Systems". Standards defined for power user connections and power supply from this Norm have been included in power usage agreements developed for execution between power producers and end-users. These standards define power quality requirements, measurement accuracy limits and performance verification procedures for power supply service.

Separate Model Agreements were adopted by the SEA in Fall 1999 for electric supply, natural gas and central heating/water heating domestic and non-domestic customers. For example, the Model Agreement between Licensed Electric Power Producers and Electric Power Users developed for use by the SEA in October 1999 requires the producer to "assure an uninterrupted, reliable higher quality and safe power supply to the user", specifies an allowable voltage range of + or - 10% and a 50 Hz frequency with a + or - 0.4% range measured at the power meter. Standards are also specified for reconnection of service after non-payment and installation or replacement of a meter or burned-out fuse, and each User must be given advance notification of the reason for and anticipated duration of scheduled power shutdowns. Should the Producer fail to repair malfunctions or provide services within the agreed time periods, it must pay the User a penalty in the amount of 3% of the service monthly rate for each day or hour of service interruption caused by its failure. The SEA resolves disputes between the parties as to the application of these provisions.

Similar service quality standards and penalties for non-compliance apply to natural gas supply service under the Model Agreement for that service. Standards are stated for natural gas service continuity, physical quality, service pressure, service interruption notice and timeliness of User equipment repairs with a 3% penalty payment required for service interruptions caused by a failure to timely repair or provide service. The Model Agreement for Heating and Hot Water supply to the public also requires high quality and uninterrupted supply, and further states specific standards for maintaining optimal system hydraulics, delivered water temperature (57%) and quality, monthly inspections to identify and repair leaks in User internal heating installations as well as notification of the reasons for and anticipated duration of planned service interruptions. A 3% penalty payment of the average monthly cost of heat consumed by the customer in the prior three months is provided for a failure to deliver or inadequate quantities of heat and hot water supply, and the bill is prorated to require payment only for the amount actually delivered.

A more complete description of the Kyrgyz program and copies of the model Agreements described above are set forth in Appendix 2C.

5.6 **North American and European Service Quality Programs** typically include elements directed at service availability and reliability (i.e. SAIDI, SAIFI, CAIDI & MAIFI), customer service activities (telephone response times, customer inquiry response times, etc) and safety standards. In addition to standards with automatic customer payments and the potential for regulator imposed fines such as those described above, a number of American Commissions also impose a requirement that a distribution utility measure service interruptions (i.e. prepare SAIDI, SAIFI and/or CAIDI measurements) for each distribution circuit, and that it identify and

report to the Commission the worst 5% or 10% of such circuits, or all such circuits with a performance result substantially above its system average performance. The service provider is then required to prepare a plan, including any needed investments or maintenance expenditure increases, to improve performance on these circuits to its system average within a specified period of time. American Commissions often employ targeted customer surveys as a part of their programs in order to measure customer satisfaction with particularly service provider customer service activities (i.e. the complaint response process, time periods before rendering of requested services, etc.), but not as the basis for the imposition of direct financial incentives as such surveys are not considered to be "objective" measurements of service operations and may be influenced by many unrelated factors such as the wording of questions asked.

Safety standards adopted are primarily of two kinds. For electric and natural gas utilities, a performance measure for employee safety is adopted: lost work time due to accidents. For natural gas operations, a performance measure directly affecting customer safety, response time for Class I and II odor telephone call notifications (i.e. the Class level denoting the seriousness of the call measured by pervasiveness of the odor), is also imposed with compliance being measured as the percentage of calls resolved within a several hour period. One Commission has, in addition, proposed a standard which requires electric companies to respond to downed wire calls (having an associated public hazard of electrocution) within a several hour period. North American service quality programs are further described at Appendices 3 and 4.

Service quality enhancement programs in Spain, Great Britain and Norway are described at Appendix 3. Tabular information on service quality standards in Spain is set forth in Appendix 5. A significant feature of particularly the Spanish program is its defining of standards for areas having similar customer densities and other characteristics affecting service quality, a feature implemented or under development in a number of United States programs.

6. Possible Effects upon Regulator Authority to adopt a Service Quality Incentive Program of Ministry of Energy Technical Organizations empowered to adopt Technical Service Quality Standards.

6.1 Several Committee members indicated concern that the role played by Gosenergonadzor or similar organizations, i.e. an organization located in their Country's Ministry of Energy, in establishing and enforcing technical electric and natural gas service quality standards, might limit the extent to which they as Regulators could adopt enhanced service quality programs. [1] Gosenergonadzor defines technical performance parameters, i.e. such as voltage, frequency and system design requirements, which in some instances duplicate and in others may influence the contents of Regulator adopted service standards. The standards most affected would, of course, be those related to attaining appropriate voltage or frequency

[1] Not all CEE/Eurasia countries have created a "Gosenergonadzor" agency. In this paper, moreover, the term is used to refer to all Ministry Offices with authority to establish electric, natural gas and central heat service standards regardless of whether that office is formally called "Gasenergonadzor". The latter named agency principally exists in countries within the territory of the former Soviet Union.

levels, with standards related to the duration or frequency of customer service outages also affected. Indeed, if a Country's law provides that Gosenergonadzor is the only government entity which can establish and enforce electric or natural gas service quality standards, than the Regulator's ability to establish incentive or penalty programs may indeed be restricted or subject to question.

6.2 However, the law may be changed or interpreted so as not to preclude the Regulator from implementing incentive or penalty programs which are not inconsistent with Gosenergonadzor's function. For example, the Commission could adopt as its "standard" that established by Gosenergonadzor, merely providing an alternative program to encourage attainment of that standard. While this would be inconsistent with the spirit of US/European service quality program development, which seeks involvement by the regulated service provider in standard development and not simply prescription of a standard administratively developed, it may not be viewed as inconsistent with local law. Second, many "customer service" standards, as opposed to "service reliability" standards, such as service complaint levels, response time for requested service provider actions, etc., would not be affected by Gosenergonadzor's functions. Gosenergonadzor establishes technical standards of service, and not standards related to the customer service or commercial function of service providers. As described above, these activities form a significant part of an enhanced service quality program and would appear implementable regardless of the presence of Gosenergonadzor.

6.3 A number of Committee members stated that, as Regulators, they worked cooperatively with Gosenergonadzor in maintaining and improving electric, natural gas and central heat service quality. Service quality standards mutually defined or adopted from regulations published by Gosenergonadzor are applied to service providers and are enforced with administrative penalties or other actions by the Commission.

7. Summary of Committee Discussion of Service/Supply Quality Maintenance and Enhancement Programs

During Committee discussion, several Committee Members noted that the financial incentive feature of the North American and European programs might render these programs inappropriate or difficult to implement in certain CEE/Eurasia Countries. These programs could be difficult to implement where the magnitude of customer non-payments made the incentive feature (whether incentive or penalty payments) difficult to implement while permitting a reasonable opportunity for the utility to earn a compensatory return on investment. Moreover, if the majority of service providers remained state owned, financial incentives might be less meaningful and not provide the desired incentive for improved service quality. State enterprises may be less focused upon achieving increased or an acceptable financial return upon their assets. Also, several Committee Members noted that telephone call centers, the speed of communication or travel, the availability of needed spare equipment parts to restore service after outages, financial constraints upon the service provider and other factors could make defining or implementing certain of the reliability or customer service standards adopted in European or

North American programs not possible in CEE/Eurasia or might require significantly reduced performance levels.

After discussion, it was generally agreed that these factors can impose significant limitations upon the nature of an incentive program that can be adopted at any given time and in a particular country. Moreover, it was emphasized that, before implementing programs of this nature, Regulators must inform themselves of whether customers desire the targeted service quality improvements and particularly whether they are willing to pay the cost of the investments needed to achieve such improvements. Finally, it was noted that each country must define for itself the nature of the program, including whether incentive and penalty elements are included, that is appropriate to its circumstances. Programs adopted in Europe and North America are adopted only following extensive consultation with consumer representatives and service providers, and perhaps surveys of the opinions of typical customers on the desirability and appropriate contents of the program. Although positive incentives and substantial penalties may be inappropriate due to substantial customer non-payments, and while the incidents of meaningful customer service to which penalty payments are attached might be different for a specific CEE/Eurasia country as compared to Europe or North America, modest penalties designed to improve service quality on matters which research demonstrates to be of importance to customers could provide effective incentives for improvement. And while state enterprises may be less influenced than private companies by financial rewards or penalties, the publicity of a reward for good or a penalty for bad service operations both within the government and the nation should provide a non-financial incentive to support service quality improvement.

Moreover, program objectives need to be considered in designing the service quality incentive program. Many European and United States programs are designed to maintain existing high quality service, whereas some Regulators may desire to improve service quality levels through the implementation of such programs. This latter objective could require differences in program approach and specific contents, particularly where obtaining service quality enhancement will require the attraction of investment capital. In that situation, the program might need to be structured to avoid excessive penalties which could reduce the return available to such capital.

Finally, although supply quality incentive programs are not a part of European and North American programs as supply is to be provided competitively through a market, the Committee concluded that supply quality standards may be a necessary term of generation or supply licenses in CEE/Eurasia countries where present conditions do not support fully competitive supply marketplaces.

Appendices

Appendix 1:	Glossary of Service Quality Standard Program Terms
Appendix 2:	Descriptions of and Specific Service Quality Standards adopted in:
A	Hungary
B	Romania
C	Kyrgyz Republic
Appendix 3:	Descriptions of Service Quality Standards Adopted in North America & Europe
Appendix 4:	United States Sample Service Quality Standards
Appendix 5:	Quality of Service in Spain, Commissioner Juan Ignacio Unda Urzaiz , Comisión Nacional de Energía (presentation at the Committee Meeting in Moscow, October 10-11, 2000)

APPENDIX 1

Glossary of Service Quality Incentive Program Terms

Business Office - A centralized service group which receives small commercial or residential billing inquiries, or both, and requests of service, whether or not equipped with an automatic call distribution system.

Busy-out rate - The number of calls to a service provider's call center or business office that received a busy signal divided by the number of calls that were received.

Call abandonment rate - The number of calls to a service provider's call center or business office that were abandoned divided by the total number of calls received at telephone call center or business office.

Call center - A centralized facility established by a utility for transactions concerning installation and repair of service, billing and other inquiries between residential and small commercial customers and service provider representatives, but not including special purpose call centers established to respond to service emergencies and operating for a temporary period of time.

Consumer Complaint - A customer complaint to the service provider or Regulator related to service interruption, billing, meter accuracy or [other defined matter].

CAIDI -- Customer Average Interruption Duration Index - The average interruption duration of sustained interruptions for those customers who experience interruptions during the analysis period. CAIDI represents the average time required to restore service to the average customer per sustained interruption. It is determined by dividing the sum of all sustained customer interruption durations, in minutes, by the total number of interrupted customers.

CAIFI -- Customer Average Interruption Frequency Index - The average number of interruptions for those customers who experience interruptions during the year. It is calculated by dividing the total annual number of customer interruptions by the total number of customers affected by interruptions. In determining the total number of customers affected, each customer is counted only once regardless of the number of customer interruptions that the customer may have experienced during the year.

Collar - A band of service performance for a particular service established around the point standard or the deadband around that point standard within which penalties or incentives shall be paid. A collar serves to establish a maximum penalty or incentive.

Controllable interruption - An interruption caused or exacerbated in scope and duration by the condition of facilities, equipment, or premises owned or operated by a service provider, or by the

action or inaction of persons under a service provider's control, and that could have been prevented by the use of generally accepted engineering, construction, or maintenance practices.

Deadband - A band, often established at one or two standards of deviation, around the single point of service performance established as the standard within which neither a penalty nor incentive will be paid as performance has not significantly deviated from the standard.

Excludable Major event - A major outage event that meets either of the three following criteria: (I) the event is caused by earthquake, fire, or storm of sufficient intensity to give rise to a state of emergency proclaimed by the Government; (ii) any other event not in (I) that causes unplanned interruption of service to 15 percent or more of the company's customers, or (iii) the event was a result of the failure of another service provider's transmission or power supply system.

Guaranteed Performance Standards - These terms are employed in some programs to denote service "standards" or "guarantees" applicable to service to individual customers, including service interruptions and durations, response to customer complaints, service requests, etc. Modest payments are made to customers affected either automatically or upon application where such standards are not attained.

Justified Consumer Complaint Rate - The number of Customer Complaints found to be justified after examination by the service provider or Regulator.

Lost Work Time Accident Rate - The incidence of lost-work time injuries and illness per 200,000 Employee Hours as these capitalized terms are defined by the U.S. Department of Labor Bureau of Labor Statistics.

MAIFI -- Momentary Average Interruption Frequency Index - The average frequency of momentary interruptions per customer occurring during the analysis period. It is calculated by dividing the total number of momentary customer interruptions by the total number of customers served.

Momentary customer interruption - The loss of electric service by one or more customers for the period defined as a momentary customer interruption by the IEEE as it may change from time to time. The term does not include interruptions described in the definition of 'major event".

Overall Standards of Performance - These terms are employed in some programs to denote system wide service standards which measure and report service quality to the average customer, including particularly the magnitude of service interruption and interruption durations. Incentives or penalties may be paid for attainment or non-attainment of these standards after review by the Regulator.

Power fluctuation or surge - A departure of more than one minute in duration in the frequency or voltage of power supplied to the customer's point of service that is caused by the failure or operation of a single component, or simultaneous failure or operation of directly connected

components, of a service provider's transmission or distribution system, that exceeds the Regulator's standards for frequency and voltage and that causes damage to customer goods.

SAIDI -- System Average Interruption Duration Index - The average duration of sustained customer interruptions per customer occurring during the analysis period. It is the average time customers were without power. It is determined by dividing the sum of all sustained customer interruption durations, in minutes, by the total number of customers served.

SAIFI -- System Average Interruption Frequency Index - The average frequency of sustained interruptions per customer occurring during the analysis period. It is calculated by dividing the total number of sustained customer interruption by the total number of customers served.

Service Interruption Duration - A period of time measured to the nearest 1-minute increment which starts when an electric distribution company is notified or becomes aware of an interruption, unless and electric distribution company can determine a more precise estimate of the actual starting time of an interruption and ends when service is restored. Interruptions shall be categorized, based on duration, such as momentary or sustained interruptions, or by similar descriptions, as adopted by IEEE or similar organization identified by the Commission.

Sustained customer interruption - The loss of electric service by one or more customers for the period defined as a sustained customer interruption by IEEE. This term does not include interruptions described in the definition of "major event".

Transaction survey - A survey targeted toward individuals that have had a recent interaction with a service provider. A transaction includes filing a complaint, inquiring about a bill, having a repair completed, installation of service or an appointment for a special meter reading.

Worst performing circuits - Those distribution circuits which, for each reliability index, are (i) among the five percent of all circuits in an operation area (or at least one circuit for each reliability index) with the highest achieved values (lowest performance levels) for the reliability index; or (ii) has obtained a value for the reporting year that is more than 300% greater than the system average of all circuits for that index in any two consecutive years. For the purpose of identifying worst-performing circuits, only distribution circuit interruptions and customers affected by such interruptions shall be considered in calculating the reliability indices.

[The above definitions required to design and implement a Service Quality Incentive Program have been taken primarily from Regulations adopted by the Energy Regulators in Illinois, Massachusetts, New York and Pennsylvania. These Regulations continue to define the service quality standards actually adopted by the Regulator, state the obligation of the service provider to comply with those standards, to keep records which will permit audits of its compliance and reports required to be filed with the Regulator.]

Appendix 2 A

Descriptions of and Specific Service Quality Standards

Hungary

1. *What supply and transmission/distribution service quality standards does your statute or regulation presently impose on government owned/operated or private owned/operated electricity and natural gas systems within your country? Please describe the specific standards imposed (i.e. interruption of service, voltage level, etc.) and any incentives/penalties employed to encourage compliance.*

The Electricity Act 1994 gives the power to the Hungarian Energy Office (the Regulator) to supervise the service quality of Licence Holders independent of ownership that is both for state and private owned utilities. To fulfil this task HEO issued resolutions, guidelines in the following fields:

a) Reports of breakdowns, and their evaluation
b) Assessment of consumers' satisfaction
c) Guaranteed standards of performance
d) Overall standards of performance

See detailed description later under answer 4.
About incentives: In 1999 we introduced the Guaranteed Standards according to which the utility pays. 1000 Hungarian Forint (cca 3,5 US $) to the consumer if the utility does not meet the standards.
About penalties: In 2000 we have imposed penalties on 4 utilities from 6 as the quality of service became worse in 1999 according to the breakdowns data analysis prepared by the HEO. We have to emphasize that unfortunately the Act provisions are very clear in this respect.

The physical parameters of the supplied gas are described by standards. Measurement and supervision of additional factors are exercised as follows by the Hungarian Energy Office (HEO) on the basis of the Act on Gas Supply:

a. examinations of consumer satisfaction, data supply on interruptions due to failures or other reasons,
b. supply quality standards, and within application and measurement of guaranteed supply indices

The results from the examinations and data supply are evaluated on a yearly basis by HEO, supply quality indices and guaranteed standards are being introduced at present.

2. *Why do you or your government believe that the imposition of these standards are necessary or appropriate?*

Since the establishment of HEO we have been monitoring the breakdowns affecting consumers e.g interruption time. The results of supply service analysis shows that since the introduction of the price-cap formula in 1997 supply quality is has deteriorated as this type of rate regulation gives incentives to reduce the cost of the utility and not to improve the quality . In the yearly Report to the Parliament HEO publishes inter alia this experience, too. The MPs can state the tendencies from these reports and required HEO to give incentives or instruct suppliers to improve supply quality.

It is required that all 10 gas suppliers in monopoly situation within their territory shall provide supply of the same standards.

3. *How and in what context are the standards imposed (as part of a license authorizing service, as part of the privatization process, in connection with company merger approval or in connection with enforcement of a rate cap, etc.)?*

The standards are imposed in the context of the power given to HEO by Electricity Act to supervise the quality of service. (The draft of the future electricity act gives this power to the minister to set supply quality standards.

According to the authorisation in the Act on Gas Supply HEO specified the introduction and application of procedures of Article a, b, c in the separate resolutions in the operational licenses for the gas suppliers.

4.*Does your country's Ministry of Energy, Gosenergonadzor or other government entity impose electric or natural gas service quality standards? Please explain fully and describe the specific standards and enforcement mechanism employed.*
The HEO imposes service standards as follows:

- Reports of breakdowns, and their evaluation
- The Licensee shall submit report to the Hungarian Energy Office without any request afore on the most important events of operation and breakdowns.
- The Licensee shall submit yearly statistical breakdowns report.
- The content of the information supplied shall be uniform depending on the type of license to promote analysis.
- Data in yearly reports should promote comparative analysis in order so that data could be compared to each other and to the year before.
- The structure of information shall also include the basic data obtained in the previous 5 years to supervise the tendencies.
- The parameters shall also include elements suitable to be compared at an international level.
- The information shall be able to be processed by computer.

- **Information to be supplied unrequiste** Events of national importance that affect a wide circle of consumers or those resulting in the failure of some very important object shall be reported individually:
- Emergency restrictions according to the Governmental Decree (Licensees)
- Curtailment and their effect, if the non-supplied electric energy exceeds 50,000 kWh (Licensees).
- System collapse, significant breakdown in the basic grid in the national cooperating power system (Transported).
- "Non-availability" of at least 50% of the installed capacity at any of the four large power stations (Generator)
- Significant environmental pollution. (Generator)
- Ordering smog alarm. (Generator)
- Sabotage actions. (Licensees)
- Supply failure to individually specified objects/consumer groups for more than 1 hour. (Supplier)

INDIVIDUAL BREAKDOWN INVESTGATION ON SITE
Depending on individual case
- report submitted
- social circumstances
- consumer complaint
- Judgement of the expected behaviour of licensee - plan, design, operation, maintenance, restoration
- Reporting obligation:
- Immediate report (breakdowns resulting more than 50,000 kWh loss of consumption). Yearly summarised reports
- Evaluation together with suppliers, publication of results
- Uniform, comparable data collection (audited) and evaluation procedures
- Eliminate disturbing factors, continuous evaluation

Breakdowns of the power supply companies (summarised on national level) in Hungary

	1996	**1997**	**1998**	**1999**	**5 year average**
Outage per one consumer, kWh/consumer	0.895	0.726	0,838	1,294	0.778
Number of breakdowns on high voltage, No. of events	53	36	24	33	35
Number of breakdowns on medium voltage, No. of events	10,493	8,570	10,207	10,816	9,670
Energy loss due to breakdowns on middle voltage, MWh	4,510	3,452	4,096	6,433	3,788
Duration of breakdowns on middle voltage, hours	15,928	11,900	16,240	26,362	13,888
Number of breakdowns on low	241,760	225,421	214,325	183,730	233,049

voltage, No. of events					
Specific number of single faults, No. of events/1000 consumers	35,65	32,05	29,31	24,32	33,96
Specific number of multiple faults, No. of events/1000 consumers	13,32	13,06	13,26	12,00	13,12

ASSESSMENT OF CONSUMERS' SATISFACTION

- QUALITY OF SUPPLY
  - quality of product and service,
  - fault clearing.
- OPERATIONAL RELATIONS
  - meter reading, billing,
  - paying order,
  - handling of complaints.
- COMMUNICATION WITH THE CONSUMERS
  - assessment of employees,
  - provision of information,
  - external relations.
- PRICES
  - tariffs,
  - discounts,
  - tariff zones.

METHOD OF CONSUMER SATISFACTION SURVEY IN HUNGARY

1. Aim: measurement of household and business consumers' satisfaction on services provided by utility
2. Research carried out at the same time in all the utilities.
3. Independent organisation carried out the research
4. The same questionnaire for all the utilities
5. Reliability level minimum 95%, error max 5%.
6. 1 - 5 scale should be used for measurement of components of service.
7. Overall satisfaction built on the satisfactions of different components of service structured in hierarchy
8. Satisfaction index : a comprehensive measuring tool of core business and overall performance

SELECTION OF CONSUMERS

Representative sample from both residential and business consumers withs at least 95% reliability and max 5% error

Residential sample in two stages:

- regional proportions,
- the individual settlements

The consumers to be questioned are selected by unified generating random numbers.

Business sample in two stages:

- the order of consumption (four categories)
- the statistical branch proportions

10% proportion of control in both sample

- Elementary indices calculated from the distribution of the answers to the sub-questions of the questionnaire (both satisfaction and importance).
- Complex indices related to the five service areas and to the utility calculated from the elementary indices through a series of simple averaging of different levels. (No.1-No.4)
- Exact procedure of the calculation of system is in the so called Index Code published by the Office.

Combined indices of consumer satisfaction in 1996, 1997, 1998 and 1999

Utility (regional distribution supply companies)	*Combined indices of* **consumer satisfaction**				*Measure of change* **in points**			
	1996	**1997**	**1998**	**1999**	**1997-1996**	**1998-1997**	**1999-1998**	**1999-1996**
DÉDÁSZ	69,5	67,4	65,4	**69,0**	-2,1	-2,0	**+3,6**	**-0,5**
DÉMÁSZ	67,9	69,8	71,1	**69,0**	1,9	2,3	**-2,1**	**+1,1**
ELMŰ	60,5	64,8	67,6	**65,4**	4,3	2,8	**-2,2**	**+4,9**
ÉDÁSZ	64,8	68,1	74,1	**74,8**	3,3	6,0	**+0,7**	**+10,0**
ÉMÁSZ	66,3	69,3	70,7	**68,6**	3,0	1,4	**-2,1**	**+2,3**
TITÁSZ	65,1	65,5	66,3	**67,6**	0,4	0,8	**+1,3**	**+2,5**
National average	**65,7**	**67,5**	**69,2**	**69,1**	**1,8**	**1,7**	**-0,1**	**+3,4**

Guaranteed standards of performance

Introduction of guaranteed standards in Hungary

- Compromise on the minimum performance between companies and Office (HEO)
- Consumer affected has to request compensation within 5 days
- Common working out a manual trying to avoid conflict with consumer
- Yearly report to Office for analysis of results

Guaranteed standards performance level

1.From the time when power cut occurred consumer site
- Budapest 4 hours
- Big cities 6 hours
- Villages 24 hours

2.Elimination of power cut concerning more consumers After getting information 24 hours

3.Information on consumer's registration on demand within 8 days

4. Establishment of connection of new consumer After coming into force 8 days

5.Keeping the appointment relating to connection and Within the time interval agreed with the consumer supervision of meter

6.Responding to a consumer's written queries Reply within 15 working days

INTERNATIONAL COMPARISON OF GUARANTEED STANDARDS

Guaranteed standards in Portugal
Service - Performance Level
Appointments to visit customer premises - Appointments during a pre-arranged period of 3 hours
Respond to a failure or an interruption in the customer supply - Within 4 hours, excluding rural areas where it is within 5 hours

Restoring supply after a disconnection caused by customers (e.g. non-payment) - LV customers – up to 5 p.m. of the following day; MV and HV customers – within 8 hours

Responding to customer queries about bills and payments - Reply within 15 working days
Investigation of voltage complaints - Visit or substantive reply within 15 working days
Responding to meter problems - Visit within 15 working days

Guaranteed standards total number	**from which of g.s. / automatic compensation**
AUSTRALIA(Victoria)	5 / 3
FRANCE	7 / 7
IRELAND	12 / 10
UNITED KINGDOM	11 / 9
PORTUGAL	6 / 6
HUNGARY	6 / -

International comparison of guaranteed standards

	UNITED KINGDOM	FRANCE	HUNGARY
Authority	EVERY TARIFF CONSUMER		Domestic consumer
Compensation Guaranteed Standard	30-60	27	4
- Respond to failure of supplier's fuse	3 hours	4 hours	4 - 24 hours
-Restoring electricity supplies after faults	24 hours	-	24 hours
-Responding to customer queries	7 days	8 days	15 days

OVERALL STANDARDS OF PERFORMANCE

Key performance indices of quality of supply in Hungary

A) RELIABILITY (SECURITY and AVAILABILITY)

- System average interruption frequency index
- System average interruption duration index
- Customer average interruption frequency index
- Restoration of supply after faults within 3 and 24 hours
- Restoration of supply after planned interruption within 3 and 24 hours
- Verified voltage complaints (per 10,000 consumers)
- Voltage not conforming to voltage standards permanently: the number of consumers at places of which the supplier could not resolve the non-conformance of network within 12 months from the notification, per 10,000 consumers (number/10,000 consumers/year).
- Overall safety of the overhead-line network: number of breakdowns per 100 km overhead lines of middle and high voltage, separately and together (number/100 km).
- Overall safety of the cable network: number of breakdowns per 100 km cables of medium and high voltage, separately and together (number/100 km).

B) Relations with consumers

- Information given in reply to a request regarding consumption: The average length of time from the written request regarding consumption by the consumer till the written information by the supplier (day/consumer).
- Connection of new customers to the system: The average length of time from the coming into force of the public utility contract till the connection of the point of consumption to the system (if the conditions of the relevant legal rules are fulfilled) (day/consumer).
- Information given in reply to written request: In case of any written request of a consumer with regard to electricity supply, the average length of time from the reception of request till the effective reply of the supplier (day/consumer).
- Ratio of quick accessibility of the supplier: The number of phone requests per total number of requests of the consumers per year.

♦ Reply given to the (personal, written, phone) requests of consumers: In case of any personal, written or phone request with regard to electricity supply, the average length of time from the reception of request till the effective reply of the supplier.

Supervision of gas supply standards is the competence of HEO. The Ministry or any other governmental office has no direct role in the supervision of supply quality.

5. *Have you any measurement standard or incentive applicable to electric or natural gas supply or service providers whose advantages and disadvantages your Agency wishes discussed by the Committee?*

Regarding electricity supply all of the measurement of standard can be discussed but if the time is limited then (1) the measurement of overall standards of performance would be useful, (2) how to enforce the improvement of quality.

As far as gas supply is concerned command of incentive methods, possibilities of application and experiences in this field is required.

6. *Does your Agency employ interruptible supply, time of use or other rates which vary with supply quality? Please describe all such rates.*

We employ interruptible supply and rates with the gas supply.
The Ministerial Decree on the Determination of Natural Gas Fees enables non-payment of capacity fee as contained in the contract with alternative and puffer consumers Such interruptions of supply do not belong to the classical quality standards.

Appendix 2 B

Descriptions of and Specific Service Quality Standards

Romania

1. What supply and transmission/distribution service quality standards does your statute or regulation presently impose on government owned/operated or private owned/operated electricity and natural gas systems within your country? Please describe the specific standards imposed (i.e. interruption of service, voltage level, etc.) and any incentives/penalties employed to encourage compliance.

The Performance Standards for electricity distribution and supply issued by National Energy Regulatory Authority (ANRE) are meant to establish the minimal performances to be met by the suppliers in their relationship with the consumers. To this purpose, both *quantitative* and *qualitative* indicators were determined for supply services. The role of the performance standards is twofold: through the *guaranteed performance indicators*, they impose a minimum level of quality to be met by the supplier for the delivered services and through the *general performance indicators* they provide performance appraisals for every supplier and make comparisons.

Average frequency of supply outage, restoration of supply after a breakdown, length of time required for giving information in reply to the requests, number of applications regarding the connection to the system, number of complaints concerning billings or meters' performances are some of the general performance indicators established in quality standards. Because year 2000 is the first year when the quality standards are in force there are no penalties for non-compliance with the general performance indicators.

The guaranteed performance indicators are mandatory and non-compliance with the specified values entail tariffs reduction applied to the supplier in question as a penalty. The main guaranteed performance indicators are the voltage and frequency levels. The limit values follow the conditions established by the EN 50160 standard.

The detailed performance indicators are presented in the following table.

No.	Performance indicators for the electricity distribution, supply services (yearly indicators)
	Denomination
Connection of the consumers	
1	No. of consumers applications for a new connection or modification of an existing connection
2	No of application for which the time span between the connection application registering date and the receiving of the technical acceptance for connection is shorter than 15/30/60 days
Contracting activity	
3 4	No of application for contracts for electricity distribution, supply service per levels of voltages and categories of users. No. of contracts solved within 15 calendar days
Metering activity	
5	No. of consumers complaints regarding the meters performances
6	No. of consumers complaints solved within 10/15 days for residential customers and within 10 days for industrial ones.
Billing activity	
7	No. of consumers applications for changing the electricity type of tariff
8	No. of consumers applications solved within 10/15 days for residential customers and within 10 days for industrial ones.
9	No. of complaints regarding the billing activity
10	No. of complaints solved within 10 days
11	No. of justified complaints
12	No. of consumers disconnected/restored for billing problems
Failures, scheduled interruptions	
13 14 15	No. of incidents and disturbances No. of incidents and disturbances solved in less than 4 hours. No. of incidents and disturbances solved in less than 24 hours
16 17 18	No. of scheduled interruptions. Total duration of scheduled interruptions (hours). No. of users affected by scheduled interruptions
Quality of the electricity	
19 20 21	No of complaints on voltage level No of complaints responded within 15 calendar days. No of complaints that could not be solved
General complaints and written queries	
22 23	No of written complaints, other than the ones referred to explicitly in the quality standard. No of written complaints other than the ones referred explicitly in the performance standard to which no response has been given within a term shorter that 30 calendar

	days
24	No of written complaints concerning failure to observe the obligations from license
25	Types of non-observed obligation (as per License)

Yearly, the distributors and suppliers must send to ANRE a report regarding the values of the performance indicators. These reports are public through the ANRE 's web site and the consumers are able to analyze and make comparisons between distributors or/and suppliers regarding the quality of the service.

For transmission activity the Electricity Transmission Grid Technical Code stipulates the technical quality parameters of the transmission and system services (frequency, voltage, safety operation). The compliance with the limit values is mandatory.

For natural gas, this year was established a regulatory authority – ANRGN.

2. Why do you or your government believe that the imposition of these standards are necessary or appropriate?
They are necessary for protection of the consumers, for benchmarking concerning the distributors and suppliers activity and also for the regulator who could intend to bring some pressure on the business organizations of electricity distribution and supply to improve their activities.

3. How and in what context are the standards imposed (as part of a license authorizing service, as part of the privatization process, in connection with company merger approval or in connection with enforcement of a rate cap, etc.)?
The quality standards are imposed as part of license authorizing service.

4. Does your country's Ministry of Energy, Gosenergonadzor or other government entity impose electric or natural gas service quality standards? Please explain fully and describe the specific standards and enforcement mechanism employed.
Only the regulatory authority imposes quality standards.

5. Have you any measurement standard or incentive applicable to electric or natural gas supply or service providers whose advantages and disadvantages your Agency wishes discussed by the Committee?
Performance standards will be periodically revised in order to increase the energy service requirements. Penalties will be introduced in the future for non-achievement of the general performance indicators, as it is the practice in the EU countries.

6. Does your Agency employ interruptible supply, time of use or other rates, which vary with supply quality? Please describe all such rates.
ANRE intends to introduce starting next year rates for interruptible supply.

APPENDIX 2 C

DESCRIPTIONS OF AND SPECIFIC SERVICE QUALITY STANDARDS

Kyrgyz Republic

The State Energy Agency (SEA) of the Kyrgyz Republic Government established procedure to measure quality performance of electric power supply services. To achieve the established level of service, each energy producer should meet the corresponding requirements.

This presentation addresses the requirements and norms intended for your information only, not necessarily to be observed by each of you. However, you will be familiarized with the requirements and norms that exist in the Kyrgyz Republic and support a reliable and up-to-date electric power supply.

1. Power Quality

In regard to the requirements on power quality, the Kyrgyz Republic, as a member of the Intergovernmental Board for Metrology Standardization and Certification, will be governed by the Intergovernmental Norm GOST 13109-97, "Power Quality Specifications for General-purpose Power Supply Systems."

In the above mentioned Norm, quality performance standards and requirements are established for the electric power that is distributed through the power networks of general-purpose power supply systems with 50-Hz three-phase or single-phase configuration, such requirements applicable to the points of connection to the networks owned by various power users, or to the electric loads (common connection points).

The requirements in the above Norm should be introduced into specifications on the connection of electric power users, into power usage agreements executed between power producers and users, and into terms and conditions of a license for corresponding activities of the licensee.

Power quality requirements for power networks in the ownership by the power users shall not be lower than those established in the Norm.

The Norm referred to above specifies also the standards for:

- Nomenclature, definitions, and abbreviations;
- Power quality performance;
- Power quality requirements;
- Verification of power quality performance based on the requirements specified for operation conditions;
- Accuracy requirements for measuring power quality performance;
- Requirements on averaging-out the power quality performance data;

■ Methods to be used for calculation or determination of power quality performance and auxiliary characteristics.

2. Power Supply Service Quality

Issues related to the quality of power supply to users are controlled by the Regulations on Electric Power Usage introduced by the SEA in 1998.

The Regulations state the principles for power usage and define interactions between power producers and users, the principles being mandatory for both power producers and users regardless of the ownership type or departmental affiliation.

In particular, the Regulations stipulate a model agreement for power supply to non-residential users as well as an agreement on rendering power supply services to the population.

Similar model agreements on gas/heat supply are developed and approved.

Liability for an agreement breach, including that related to the quality performance, is covered in the provisions of the Kyrgyz Republic Civil Code, where Clauses 487-496 address power supply issues. In accordance with the Law "On Power System", the State Energy Agency (SEA) is authorized to perform regulatory activities in the areas of service quality assessment and monitoring in the fuel and energy complex.

Currently, we still have to develop indexes, performance factors and other standards to assess service quality. Such work is going on, including statistics gathering related to service quality reduction issues.

These and other relevant data will and shall be collected only after the model agreements referred to earlier are implemented into practice and have been proven viable.

As an illustration, we attached some model agreements for power/heat supply, as well as the terms and conditions of a license intended for a heat/power seller, which reflect, among others, the responsibilities related to service quality.

APPROVED

by the Decision of the Executive Board/
State Energy Agency
Kyrgyz Republic Government

Date _____
No. _____

Terms and Conditions for Electric Power Sale
Kalinin Hydroelectric Plant Company [ОсОО « Калининская ГЭС»]

License No. 00013 / Issue No. 1-ГАЭ

1. GENERAL PROVISIONS

1.1 This License, containing the following License Terms and Conditions, has been issued in accordance with the Kyrgyz Republic laws "On Licensing", "On Power System", and "On Electric Power System", as well as with the Regulation on the Activities Licensing Related to the Electric Power System within the Kyrgyz Republic".

1.2 The Kalinin Hydroelectric Plant Company [ОсОО « Калининская ГЭС»] hereinafter referred to as Licensee) shall not sell or assign the License to or make any third party an assignee of the License, unless an appropriate written authorization is issued to the Licensee by the State Energy Agency.

1.3 At any time, the Licensee shall hold only one license to sell electric power.

1.4 Any communications referred to in this License shall be in writing only and shall be served to the registered office of the State Energy Agency or Licensee.

1.5 Terms and conditions of this License shall apply to any Licensee personnel involved in the Licensed activities.

1.6 The specific words and terms as used in the License, License Terms and Conditions, or Attachments to the License shall be understood as follows:

SEA [ГАЭ]	State Energy Agency acting under Kyrgyz Republic Government
Effective date of the License	**License filing date**
Law "On Power System"	Kyrgyz Republic law "On Power System" as of October 30, 1996
Law "On Electric Power System"	Kyrgyz Republic law "On Electric Power System" as of January 28, 1997
Orders and regulations	Orders, regulations, norms, codes, or any other regulatory documents of statutory nature, as well as other legal acts, contracts, or any other legally binding agreements
End user	End user of electric power
Service contract	Contract to supply electric power to residential users or Contract to supply electric power to non-residential users
Heavy power user	An entity serviced directly from a High-Voltage Power Transmission Network
License	A special permission to engage in the licensed activities, issued by the SEA to the Licensee
License to conduct activities in the electric	A license issued by the SEA to produce, transmit, distribute, sell, export,

power sector	or import electric power
Licensee	A legal entity referred to on the first page of this License Terms and Conditions document
Licensed activities	Activities directly related to the Licensee involvement in electric power production
Electric power purchase agreement	Agreement to purchase electric power at a specified price within a specified period of time, as executed between the License Issuer and the Holder of a license to conduct activities in the electric power sector
License Terms and Conditions	All terms and conditions specified in this document and its attachments, as well as Licensee/SEA's rights and responsibilities that are applicable to this document and related to the Licensed activities

2. LICENSED ACTIVITIES IMPLEMENTATION

2.1 By virtue of this License, the Licensee may supply and sell electric power to End users connected to the electric power distribution systems and associated equipment specified in Attachment A and owned or controlled by the Licensee.

2.2 The Licensee shall not interfere, impede or attempt to create obstacles to other licensees, potential competitors or energy producers in their activities related to electric power generation, transmission, distribution or marketing, as well as electric power imports or exports.

2.3 The Licensee may not participate, in any capacity, in the activities that contribute to energy market monopolization are prohibited in the laws of the Kyrgyz Republic or by the Orders and regulations issued by the SEA.

2.4 The Licensee shall conduct the Licensed activities in accordance with the principles of cost efficiency so that to achieve the lowest energy cost to End users, provided that power system safety and reliability standards are maintained.

2.5 Acting in accordance with the Kyrgyz Republic Law "On Energy Saving", the Licensee undertakes to facilitate energy saving actions performed both by the companies under Licensee's control and by users.

2.6 The Licensee shall not engage in the activities preventing or capable to prevent the Licensee from proper execution of the Licensed activities.

2.7 The Licensee may not cooperate with other licensees or entities on issues related to the rate proposals for the power generated, unless such cooperation is permitted under the laws of the Kyrgyz Republic or by the Orders and regulations issued by the SEA. The Licensee shall not enter in any collusion concerning the Licensed activities, in a manner damaging to the interests of users.

3 LICENSEE RESPONSIBILITIES

3.1 Licensed Activities Management

3.1.1 The Licensee shall submit reporting documentation on the managerial, operational, and financial aspects of the Licensed activities, separately from the other activities of the Licensee, including those covered by the SEA License.

3.1.2 The Licensee shall maintain separate accounting and prepare separate profit-and-loss statements, cash flow reports, and balance sheet for the Licensed activities in accordance with the Orders and regulations issued by the SEA, as well as the accounting principles existing in the Kyrgyz Republic, including any amendments. The Licensee shall submit an annual report that shall include the data specified in Attachment B.

3.1.3 The Licensee shall reasonably allocate general expenses to the Licensed activities or other activities in accordance with the existing principles, and, as requested by the SEA, shall submit written documents in support of such allocation and performance reports. In case such principles are violated, the SEA shall have the right to request that the Licensee revise its policy on current expenses and proceeds.

3.1.4 The Licensee shall not enter any Cross-subsidization in support of the Licensed activities, implemented by financing, swapping or allocations from other forms of the activities owned or controlled by the Licensee. Correspondingly, the Licensee may not use assets, barter commodities or allocations generated by the Licensed activities to implement Cross-subsidization of other productive activities owned or controlled by the Licensee.

3.2 The reports submitted to the SEA by the Licensee shall be deemed common property unless the SEA, acting on its own or upon Licensee's request, acknowledges by a formal determination that such disclosure will not serve the interests of the community or can cause commercial loss by the Licensee.

3.3 Power Rates, Connection Fees, and Contracts

3.3.1 Electric power rates payable to the Licensee by End users shall not exceed the rates established by the SEA for the specific End users' group within the region of the End user location.

3.3.2 The Licensee shall sell electric power to End users in accordance with the Service contract terms and conditions. The Licensee shall provide each End user with a copy of such Contract.

3.3.3 The Licensee may, by negotiating an electric power sale agreement, enter an agreement to purchase electric power from one or more of the following entities:
Holder of a License for electric power distribution;
Holder of a License for electric power marketing;
Holder of a License for electric power imports;
Holder of a License for electric power production – in cases where the Licensee qualifies as a Heavy power user.

3.4 REVENUE METERING

3.4.1 The Licensee shall ensure that each End user is provided with a legally installed energy meter to measure factual energy consumption. The consumption amount recorded by such meters will be used to calculate the amount of energy consumed.

3.4.2 Each meter utilized by an End user shall be Licensee's property. The Licensee shall reimburse to those End users who currently own such meters, for the cost of the meters. The amount to be reimbursed and meters buy-out schedule shall be agreed upon with the SEA.

3.4.3 When a new End user is connected to the distribution networks of the Licensee, a total amount of the connection fee shall include the energy meter installation costs.

3.5 The Licensee shall abide by the laws of the Kyrgyz Republic, including those related to standards and Orders and regulations in effect.

3.6 The Licensee shall pay a regulatory charge on a regular long-term basis and in a timely manner during the period the License is valid as determined by the SEA.

3.7 In cases where any dispute arises between the Licensee and other holder of a License to conduct activities in the electric power production sector, or between the Licensee and End user, and where such dispute cannot be resolved by negotiations, the issue shall be taken to the SEA for the dispute resolution in accordance with the established procedural practice.

3.8 Reporting

3.8.1 Per the SEA request, the Licensee shall submit to the SEA a copy of any report submitted to the Ministry of Finance, National Committee on Statistics or other government bodies of the Kyrgyz Republic, and also shall compile and submit any other data that the SEA may consider necessary to perform the SEA duties.

3.8.2 The Licensee shall notify the SEA within ten (10) days about any change in the Licensee legal address or Bank essential data.

3.8.3 Within two month after the License enters into force, the Licensee shall submit to the SEA the data specified in Attachment C.

4 REGULATION OF LICENSED ACTIVITIES

4.1 The SEA shall control Licensee's adherence to the Terms and Conditions of this License, request and review reports submitted by the Licensee, and shall conduct audits of financial and business activities of the Licensee in accordance with the existing laws of the Kyrgyz Republic.

4.2 The SEA or its authorized representatives may access the facilities of the Licensee to conduct audits of the facilities and documentation related to the Licensed activities, the Licensee being responsible for any necessary assistance to the SEA in controlling adherence to the License Terms and Conditions.

4.3 Upon any justified complaint or at its own discretion, the SEA may initiate an audit of Licensee's adherence to the License Terms and Conditions, including business activities of the Licensee related to the licensed activities.

4.4 The Licensee shall abide by any decision in regard to the Licensee, made in accordance with the SEA Orders and regulations, including payment of penalty charges established by the SEA, in cases where the License Terms and Conditions are not observed or the authority under the License Terms and Conditions is exceeded as determined in the SEA Orders and regulations.

4.5 The Licensee shall determine order of business for complaint review, and shall report annually to the SEA the number of complaints received (grouped by type) and the review results.

4.6 Following the discovery of one or more violations of the License Terms and Conditions by the Licensee, the SEA may initiate such actions within its authority, which the SEA considers necessary under the circumstances to protect the interests of End users, including suspension or cancellation of the License.

5. LICENSE AMENDMENTS

5.1 The SEA may amend the License Terms and Conditions if such amendment is required to adapt to the regulations of the Kyrgyz Republic or to the decision made by the SEA, court of justice, or arbitration court. Any such amendment shall be restricted by the provisions necessary to adapt the License to such regulations or decisions, and shall be implemented in accordance with the procedures established by the SEA.

5.2 In addition to the instances referred to in Paragraph 5.1, the SEA or Licensee may at any time present to the opponent written proposals on amendments and supplements to the License Terms and Conditions, together with supporting statements. Should the parties agree on the amendments as proposed and if the SEA takes into account the comments of other interested parties in accordance with the established procedures, the License Terms and Conditions are subject to amendments. When the parties cannot reach an agreement, the Licensee may submit the amendments proposed by the SEA to be examined by court.

6. LICENSE SUSPENSION AND REVOCATION

6.1 The SEA may suspend the License at its own discretion for up to three months in the following instances:
i) Violation of the License Terms and Conditions by the Licensee, or
ii) Violation of the SEA decision by the Licensee, or

iii) Declaration of the Licensee's insolvency, or
iv) Post-licensing changes in the qualification structure of the personnel involved in the Licensed activities, or in the equipment or engineering capabilities.

6.2 The SEA may revoke the License, provided that the Licensee is notified in writing and allowed to respond, in the following instances:
i) Default in regard to the request from the SEA after the License suspension, or
ii) Finding of the fact that the materials and data submitted to the SEA are falsified, or
iii) Violation by the Licensee of the existing laws of the Kyrgyz Republic,
iv) Gross deviations from the performance specified in the current Business Agreement.

6.3 The Licensee may file with the court an appeal against the SEA decision on the License suspension or cancellation.

6.4 Should the Licensee modify ownership category, legal status or organizational structure of the Licensed activities, the Licensee shall send the SEA a 90-day notice regarding the modifications proposed so that the SEA could determine whether the License is subject to modification, revocation, or assignment to other party.

7. LICENSE TERMINATION

7.1 This License shall be terminated:
i) Upon expiration of the License validity, or
ii) In the instances where the Licensee terminates the Licensed activities voluntarily or by the court decision, or Upon revocation of the License.

State Energy Agency
Kyrgyz Republic Government

LICENSE TO SELL ELECTRIC POWER
Issued for the Kalinin Hydroelectric Plant Company
[ОсОО « Калининская ГЭС»]

License No.: № 00013 Issue No. 1-ГАЭ Filing Date: /99

Attachment A

1. Auxiliary Transformer:
Model - TCMA, rated output - 60 kVA, rated high-tension voltage – 6.3 kV, rated high-tension current – 5.77 A, rated low-tension voltage – 0.4 kV, rated low-tension current – 86.6 A
2. Potential Transformer:
Model - НТМИ-6, transformation ratio – 6000:100
3. Current Transformer:
Model - ТПФМ, transformation ratio – 100:5
4. Electric Power Meter (outgoing circuit) No. 801426, Model И-681
5. Electric Power Meter (incoming circuit) No. 112253, Model И-681
6. Design Factor - 1200

State Energy Agency
Kyrgyz Republic Government

LICENSE TO SELL ELECTRIC POWER
Issued for the Kalinin Hydroelectric Plant Company
[ОсОО « Калининская ГЭС»]

License No.: № 00013 Issue No. 1-ГАЭ Filing Date: /99

Attachment C

List of data submitted to the SEA at the expiration of the 2-month period after the License enters into force

1) Numbers of End users by group, as well as distribution network voltages the End users are connected to.
2) Number of End users who own the electric power meters, and of those whose electric power meters are in the Licensee ownership. Total amount of energy consumption (in kilowatt-hours) and monthly peak demand (in MW) in 1997 and 1998.
3) Total amount of electric power bills issued (in kilowatt-hours) as well as payments received from the End users in 1997 and 1998 by months.
4) Details in regard to the rates applied to each group of End users.
5) Details in regard to annual operational costs related to electric power marketing and operation of the networks and other equipment specified in Attachment A.
6) Details in regard to operation period and conditions of the networks and other equipment specified in Attachment A.
7) Details in regard to any proposed capital expenditures, renovation or development of the existing networks and other equipment specified in Attachment A.
8) Description of the principles used by the Licensee to allocate energy marketing costs and revenues to the accounting records, as well as explanation of the method used to separate the energy marketing financial statements into a separate item unrelated to other activities.
9) Description of the dispute resolution principles between the Licensee and End users.
10) Copies of annual statements of the Licensee for two previous years.

Filed with the Ministry of Justice of the Kyrgyz Republic on October 18, 1999
File number 80

City of Bishkek, October 9, 1999, No. 37

DECISION OF THE STATE ENERGY AGENCY FOR THE KYRGYZ REPUBLIC GOVERNMENT

In order to regulate the activities of electric power producers in the area of power supply to the population, and also to protect consumer rights and to increase mutual responsibility of the producers and consumers, the Executive Board for the State Energy Agency working under the aegis of the Kyrgyz Republic Government has made the following decisions:
1. Approve an Agreement for Rendering Electric Power Supply Service to The Public and bring such Agreement into effect upon its registration by the State (see Attachment).
2. Recognize as null and void Attachment 2 (Agreement for Rendering Electric Power Supply Service to The Public) to the Regulations on Electric Power Usage approved by the decision of the Executive Board for the State Energy Agency working under the aegis of the Kyrgyz Republic Government as of July 27, 1998, under No. 11-п.

U. Mateev
Director, State Energy Agency of the Kyrgyz Republic

Approved
by the Decision of the State Energy Agency
of the Kyrgyz Republic

as of October 9, 1999
No. 37

AGREEMENT
for rendering electric power supply service to the public

This Agreement is drawn up in accordance with the Civil Code of the Kyrgyz Republic, the Kyrgyz Republic laws "On Protection of Consumers' Rights", "On Energy System", and "On Electric Energy System", and will regulate the rights and responsibilities of the Gas Supply Company and Gas user.
The Electric Power Producer _____ conducting its activities on the basis of the license for electric power distribution and marketing issued on _____ under Number _____, represented by _____, and electric power user, hereinafter referred to as USER _____ residing at the following address _____ _____, entered this Agreement for electric power supply and consumption.

1. The Electric Power Producer shall undertake the following:

1.1. Install, at the User's premises and prior to the power delivery, a power meter to be operated and owned by the Electric Power Producer.
Take power meter readings on the ___th day of each month between the following hours: from "___" to "___". Should the meter reader visit come to a holiday, the meter reader visit shall be deferred to the next day after the holiday.
1.2. Assure an uninterrupted, reliable, high-quality and safe power supply to the User, within the allowable power utilization of _____ kW. Power supply to the User shall be by means of an overhead (cable) line through a tap connected to Conductor No. _____ of a 0.23-kV transmission line.
1.3. Maintain a voltage of _____ V (+/-10%) and a frequency of 50 Hz (+/-0,4%) at the network ownership boundary between the Electric Power Producer and the User, that is represented by the power meter.
1.4. Notify the User in regard to the scheduled power shutdowns, specifying their reasons and durations in hours (_____), through the mass media or local government administration officials no later than 5 days prior to the shutdown date.
1.5. Preclude, during the emergencies, interruptions in power supply to the User, that are longer than twenty-four hours.
1.6. Review, within three days, an application submitted by the User in regard to adjustment of the allowable power utilization.
1.7. Review, within five days, an application submitted by the User in regard to power utilization payments and charges.
1.8. Notify, no later than ten days prior to disconnection date, the User, who is in default, on the necessity to rectify the default.
1.9. Restore the power supply to the User:
– Within 48 hours after the debt service payment together with the payment for the services rendered by the Electric Power Producer;
– Within three days after the reception a request from the User to install or replace a meter;
– Within 48 hours after the payment for the services rendered by the Electric Power Producer when replacing a burned-out fuse at the service.
1.10. Pay to the User a penalty in the amount of 3 per cent of the service monthly rate for each day or hour (when a repair completion time is determined in hours) of delay in repairing malfunctions or providing services without observing the specified repair or service delivery time. An amount of such penalty may not exceed the rate of the service payment.
1.11. Familiarize the User with the Regulations on Electric Power Usage approved by the decision of the Executive Board for the State Energy Agency (SAE) working under the aegis of the Kyrgyz Republic Government.

2. The User shall undertake the following:

2.1. Prevent electric power consumption without metering. Stay at home at the time and date specified in the Agreement, to support taking meter readings.
2.2. Pay the bill each calendar month, within 20 days after the month end or 10 days after the billing statement is served, based on the rates existing during the power consumption period, for the power as read from the power meter. Should the payment for the service rendered by the service company be delayed, the User shall pay a penalty of 0.1 per cent of the arrears amount for each day of delay, the total not exceeding 25 per cent of the primary debt.
2.3. Apply in advance to the Electric Power Producer for acquiring the technical specifications in regard to the necessity to increase (decrease) disposable power.
2.4. Provide free access for the representatives of the Electric Power Producer to the power meter or drop wiring to the building upon producing the company's authentication document in the days and hours specified in Paragraph 1.1.
2.5. Exclude any intervention into integrity or proper operation of the power metering devices.
2.6. Exclude unauthorized modifications to the User's power supply configuration specified in Paragraph 1.2.

3. Liability of the Sides

3.1. The Electric Power Producer shall award to the User the material damages due to violation of this Agreement by the Electric Power Producer, in accordance with the laws of the Kyrgyz Republic.
The fact and duration of an interruption in the power supply, as well as the material damages caused by such fault shall be certified by a report prepared by the USER in cooperation with the representatives from the Electric Power Producer or State Energy Inspectorate in the State Energy Agency/Kyrgyz Republic Government.
Should the representative from the Electric Power Producer or State Energy Inspectorate fail to arrive within six hours, the report shall be executed by the USER with participation of three other users served from the same line.
3.2. Should the Electric Power Producer fail to meet its obligations, the User may apply with a petition to the State Energy Agency/Kyrgyz Republic Government, or consumer associations, or court of law.
3.3. In cases where the User does not observe his/her obligations, he/she shall incur an administrative or criminal responsibility established by the Kyrgyz Republic laws.
3.4. Should the power metering devices be violated through the fault of the User (broken seal, broken glass panel, etc.) or should some amount of power be stolen, the Electric Power Producer will recalculate the payment for the power consumed, based on the installed power of the loads and the amount of hours from the last visit by the meter reader, as scheduled under this Agreement.

4. Term of Agreement Validity

4.1. This Agreement shall be deemed valid from the date it is signed by both sides until the User notifies about his/her decision to terminate the Agreement.

Electric Power Producer	User
Address _____	Address _____
Phone No. _____	Phone No._____

Approved by the Decision of the Executive Board
for the State Energy Agency Working under the of
the Kyrgyz Republic Government

November 2, 1999
No. 38

AGREEMENT
for Rendering Natural Gas Supply Service to The Public

This Agreement is drawn up in accordance with the Civil Code of the Kyrgyz Republic, the Kyrgyz Republic laws "On Energy System", "On Oil and Gas", and "On Protection of Consumers' Rights", and will regulate the rights and responsibilities of the Gas Supply Company and Gas user.

The Gas Supply Company _____
_____ (JSC KyrgyzGaz, gas supply authorities, etc.) represented by _____, hereinafter referred to as SUPPLIER, acting on the ground of the Articles of Association and Safety Regulations in the gas supply sector, on the one hand, and Mr. (Mrs./Ms.) _____ residing at the following address _____, hereinafter referred to as USER, on the other hand, entered this Agreement in regard to the following:

I. SUBJECT OF AGREEMENT

1.1. The SUPPLIER shall undertake to ensure continuity of natural gas supply, perform requested repairs payable based on the schedule of prices, in regard of gas supply equipment owned by the USER, the USER shall undertake to ensure safe operation of such equipment as well as timely pay for the services and natural gas deliveries under terms and conditions contained in this Agreement.

1.2. Metering of the natural gas deliveries shall be performed using the installed metering devices accepted and sealed by representatives of relevant state authorities. The USER shall pay for the gas consumed, based on the metering device (gas meter) readouts, by the time specified by the SUPPLIER.

1.3. In the absence of metering devices (gas meters), the amount of natural gas delivered shall be calculated based on the standards established by the Kyrgyz Republic laws.

1.4. The natural gas shall be delivered for domestic use.

II. RESPONSIBILITIES OF THE SIDES

2.1. The SUPPLIER shall undertake the following:

2.1.1. Ensure continuity of natural gas supply to the USER, based on the schedule of prices established by the State Energy Agency/Kyrgyz Republic Government.

2.1.2. Supply the USER with natural gas, based on the quality, amounts and pressure requirements in the GOST provisions relevant to domestic use.

2.1.3. Ensure, upon receiving a request to perform repairs and maintenance work (the work to be confirmed by issuing a notice for payment), that the work is completed within the period coordinated with the USER, but no later than 48 hours after the request is received. A dispatcher who receives the request shall convey his/her name and the request file number to the customer.

Complaints requiring additional verification shall be processed within one month.

For requests in regard to emergencies, such as gas leaks, an emergency response team shall be dispatched in the shortest possible time (within one hour).

2.1.4. Notify the USER through the media as to the reasons for gas supply interruption no later than 2 days prior to the gas supply interruption. Gas supply interruption through the SUPPLIER's fault shall be in violation of this Agreement, except when caused by the reasons specified in Section 3.5 of this Agreement.

2.1.5. Install at the USER's a gas meter to be operated and owned by the SUPPLIER.

Read the meters monthly in the presence of the USER.

2.1.6. Operate gas lines and bear the operational costs, including complete rehabilitation of the gas lines used by the gas supply company to deliver natural gas.
2.1.7. Recalculate payments for the gas short delivered, based on the established standards and rates, taking into consideration a number of days of factual gas delivery failure for the next month accounting purposes.
2.1.8. Pay to the USER a penalty in the amount of 3 per cent of the service monthly rate for each day or hour (when a completion time is determined in hours) of delay in repairing malfunctions or providing services without observing the specified repair or service delivery time, or when violating the terms and conditions of this Agreement.
2.2. The USER shall undertake the following:
2.2.1. Pay, within 20 days after the end of each month, for the natural gas consumed.
2.2.2. Provide free and safe access to the gas equipment for the representatives of the SUPPLIER who carry the company's authentication document, and, in emergencies, provide such access at any time during the day or night. Request in a timely manner and also arrange replacement of a gas meter or gas equipment that fails through the fault of the SUPPLIER.
2.2.3. Pay connection fees to the SUPPLIER when gas supply is interrupted through the fault of the USER.
2.2.4. Observe the rules of gas equipment operation; ensure integrity and proper handling of the gas meter and other gas equipment, and conserve the gas.
2.2.5. Transfer the delivered natural gas through the connected network to other USERS without consent of the SUPPLIER.
2.2.6. Should a number of persons residing in the home of the USER consuming natural gas (in the absence of individual meters) change, the USER shall:
a) notify the SUPPLIER in writing about increase or decrease of the number of persons residing in the home of the USER and present a supporting document, such notification being subject to be accounted for in recalculation of the charge for natural gas consumption starting from the day of such notification;
b) accept the responsibility, in accordance with the current laws, for any persons who reside in the USER's home and are unaccounted for in terms of gas consumption.
2.2.8. Compensate any arrears of payment for the natural gas consumption and shall arrange for the pay-book to be issued to the new house owner (lodger) if the USER changes the place of residence.
2.2.9. Accept the responsibility, in accordance with the current laws of the Kyrgyz Republic, for any theft of natural gas that is discovered.

III. LIABILITY OF THE SIDES AND MISCELLANEOUS PROVISIONS

3.1. Should any side fail to meet or when improperly meeting the responsibilities under this Agreement, such side shall award the actual material damages caused by such fault, in accordance with the laws of the Kyrgyz Republic.
The fact and duration of a single-time interruption in the natural gas supply, as well as the material damages caused by such fault shall be certified by a report prepared by the USER in cooperation with the representatives from the SUPPLIER or State Energy Inspectorate in the State Energy Agency/Kyrgyz Republic Government.
Should the representative from the SUPPLIER or State Energy Inspectorate fail to arrive within six hours, the report shall be executed by the USER with participation of two other USERS and the representatives from the local government administration (district or house committee, condominiums, etc.).
3.2. In case of arrears by the USER, the SUPPLIER may terminate the supply by cutting off the gas line branching off the gas transfer network after sending the USER a written notice 10 days prior to gas supply termination.
3.3. The SUPPLIER shall assign its representative to regularly communicate with the USER, to control and coordinate various issues associated with this Agreement, the representative being a gas supply company supervisor having a proper authentication.
3.4. The SUPPLIER shall assure a high-quality maintenance of the gas equipment by its personnel having completed special-purpose training.
3.5. The SUPPLIER shall not be held responsible for gas supply interruptions caused by the following circumstances:
Accidents, acts of God, wars, or acts of sabotage in the gas transport system.

3.6. Disputes arising under this Agreement shall be resolved in accordance with the current laws of the Kyrgyz Republic.
3.7. This Agreement is entered into for the period of time from "(day and month)" to "(day and month)", (year) and shall be considered extended annually for equal period, unless the USER waives such extension one month prior to the Agreement expiration date.
Gas meter installation date _____(month) "(day)", 199__ No. ___
Initial reading: _____

SUPPLIER:	USER:
Essential data:	Essential data:
Phone No. _____	Phone No.

Filed with the Ministry of Justice of the Kyrgyz Republic on November 22, 1999
File number 93

City of Bishkek, November 2, 1999, No. 38

DECISION OF THE STATE ENERGY AGENCY UNDER THE KYRGYZ REPUBLIC GOVERNMENT

In order to regulate the activities of heat producers in the area of heat supply to the population, and also to protect consumer rights and to increase responsibility of the producers, the Executive Board for the State Energy Agency working under the aegis of the Kyrgyz Republic Government has made the following decisions:
1. Approve an Agreement for Rendering Heat Supply to The Public in The Form of Hot Water for Use in Heating and Hot Water Supply, as well as an Agreement for Rendering Natural Gas Supply Service to The Public and bring such Agreements into effect upon the registration by the state (see Attachments).

U. Mateev
Director, Executive Board of the State Energy Agency of
the Kyrgyz Republic Government

Approved
by the Decision of the Executive Board of the State Energy Agency of the Kyrgyz Republic Government
as of November 2, 1999
No. 38

AGREEMENT
on Heat Delivery to The Public in The Form of Hot Water for Heating and Hot Water Supply

This Agreement is drawn up in accordance with the Civil Code of the Kyrgyz Republic, the Kyrgyz Republic Code for Administrative Responsibility, the Kyrgyz Republic laws "On Energy System" and "On Energy System", and will regulate the rights and responsibilities of the Heat Supply Company and Heat and hot water user.

The Heat Supply Company _____
_____
(JSC KyrgyzEnergo, heat utility supply authorities, etc.)
hereinafter referred to as SUPPLIER, represented by the Director _____, on the one hand, and Mr. (Mrs./Ms.) _____ residing at the following address _____, hereinafter referred to as USER, on the other hand, entered this Agreement in regard to the following:

Responsibility boundary (partition) between the SUPPLIER and USER shall be defined as follows:
1) For apartment buildings owned by local state administrations:
- Gate valves installed in the tap to the forward and return water pipelines downstream of the lifting assembly in the heating and hot water supply system.
2) For private households, cooperatives, and condominiums:
- Boundaries shall be defined on the case-by-case basis and on the basis of the act establishing balance-sheet allocation partitioning, signed by the SUPPLIER and USER (an act in the form of Attachment 2).

1. The SUPPLIER shall undertake the following:

1.1. Assure an uninterrupted heat delivery to the USER for the purposes of heating and hot water supply at the rates established by the State Energy Agency of the Kyrgyz Republic Government, and in accordance with the conditions and heat medium characteristics specified in Attachment 1.
1.2. Maintain an optimal hydraulic state (differential pressure) in the USER heat supply system, with delivery water temperature being in accordance with the design temperature profile.
1.3. Provide to the USER hot water with the temperature no lower than 57°C and with the quality meeting the GOST 2874-73 norm (Potting Water).
1.4. Maintain a regular control of heat medium and hot water losses, identify and request to rectify leaks in the internal heating installations of the USER, conducting monthly inspections.
1.5. Notify the User in regard to the scheduled heat and/or hot water supply restrictions or shutdowns, specifying their reasons and durations, through the mass media or government administration officials no later than 5 days prior to the heating system shutdown date.
1.6. Notify the User in regard to the rate adjustments, through the mass media within 5 days after approval of such adjustments by the State Energy Agency of the Kyrgyz Republic Government.
1.7. Bill the USER for the heat consumed for heating and hot water supply purposes for the previous calendar month within the first 10 days of the next month.
Billing to the USER for heat and hot water utilization shall be based on the meter readings. Should such meters be unavailable or malfunctioning due to the USER's fault, billing shall be performed in accordance with this Agreement terms and conditions, based on the thermal properties, filler structures, and the hot water consumption standards

established. Payment for the actually consumed heat energy shall be charged based on the heat demand calculation for the residential building where the USER resides.
1.8. Review, within 10 days, an application submitted by the USERS in regard to heat utilization payments and charges.
1.9. Notify, no later than 7 days prior to disconnection date, the User, who is in default, on the necessity to rectify the default.
1.10. Install, at the heat energy USER's premises, a thermal energy meter, as well as individual instruments for metering hot water consumption, to be operated and owned by the SUPPLIER.
Take thermal energy meter readings on the ___th day of each month between the following hours: from "___" to "___", and in the presence of the USER. Should the meter reader visit come to a holiday, the meter reader visit shall be deferred to the next day after the holiday.
Owners of the apartments that are leased (entirely or partly) shall install thermal energy meters for their own account. Such USERS shall be supplied with heat subject to availability of such meters.
1.11. Operate the heat networks that are shared by the owners of the apartments and utilized by the heat supplier to deliver the heat medium.
The heat supplier shall incur the costs of operation (including complete rehabilitation) of the heating system and hot water supply lines shared by the owners of the apartments in a residential building.
1.12. Familiarize the USER with the Regulations on Thermal Energy Usage.

2. The USER shall undertake the following:

2.1. Pay the bill each calendar month, within 20 days after the month end or 10 days after the billing statement is served, based on the rates existing during the heat consumption period. Should the payment for the service rendered by the service company be delayed, the USER shall pay a penalty of 0.1 per cent of the arrears amount for each day of delay, the total not exceeding 25 per cent of the primary debt.
2.2. Conserve thermal energy and hot water by timely taking measures (winterizing windows and balconies) to save hot water and heat in the heated areas.
2.3. Ensure that the personnel of the SUPPLIER could access for reading the personal thermal energy or hot water meters and for inspection of the heating and hot water supply systems on the _____th day of each month from _____ to _____.
2.4. Preclude installation or replacement of heat consuming devices and units that do not meet the design specifications, without authorization by the SUPPLIER.
2.5. Notify the SUPPLIER in writing about changes in the number of persons residing in the home of the USER, and present a supporting document, such notification being subject to be accounted for in recalculation of the heating charge in the absence of individual meters.
2.6. Compensate any arrears of payment for the heat and hot water consumption if the USER changes the place of residence.
2.7. Pay to the SUPPLIER for reconnection if heat supply is terminated through the fault of the USER.
2.8. Notify immediately the heat SUPPLIER or maintenance company, which is obligated to rectify a malfunction within 48 hours, when any hot water leaks are discovered in the apartment or the heat supply system or individual meters integrity is lost.

3. Liability of the Sides

3.1. Thermal energy and/or hot water supply interruption (except for acts of God) or short delivery to the USER for the continuous duration of one day under this Agreement shall be considered a breach of this Agreement if the SUPPLIER fails to notify the USER or the delivery temperature is lower than the values specified in accordance with Paragraph 1.1.
For thermal energy and hot water supply interruption or short delivery, the SUPPLIER shall recalculate the bill based on the actual performance, and shall pay to the USER a penalty for the factual failure to deliver thermal energy (for heating and hot water supply), in the amount of 3 per cent of the average monthly cost of the heat consumed during the last 3 months, per each day of such non-delivery.

3.2. Proper technical conditions of the internal heat supply pipelines and equipment (in both private and apartment buildings) shall be maintained by the USER.
3.3. Any alteration to the heating and hot water supply system performed without the Specifications and supporting by the design documentation shall be deemed a violation of the thermal energy utilization regulations. In such cases, the USER shall be held responsible in accordance with the Administrative Code of the Kyrgyz Republic or other existing laws.
3.4. Any disputes arising under this Agreement shall be resolved with the State Energy Agency of the Kyrgyz Republic Government or in accordance with the procedures established by the current laws of the Kyrgyz Republic. On issues not covered by this Agreement, the sides shall be governed by the current laws of the Kyrgyz Republic.
3.5. This Agreement shall be deemed valid from the date it is signed by both sides until the User notifies about his/her decision to terminate the Agreement.
3.7. Attachments 1 and 2 shall be an integral part of this Agreement.

Addresses of the SUPPLIER and USER:

SUPPLIER:	USER:
Address _____	Address _____
Phone No. _____	Phone No._____
[Seal placeholder] _____ "___", 19__	[Seal placeholder] _____ "___", 19__
Signature _____	Signature _____

Both sides shall undertake notify, in writing and in a timely manner, about any change referred to in this paragraph (essential data, bank account, etc).
This Agreement is executed in 3 copies, two of the copies to be kept by the SUPPLIER, and one copy by the USER.

ATTACHMENT 1

HEAT MEDIUM CONDITIONS AND PROPERTIES
as applied to thermal energy delivery for heating and hot water supply
by the SUPPLIER to the USER

1. The SUPPLIER shall undertake the thermal energy delivery to the USER for heating and hot water supply in the amount of _____ Gcal a year, with a peak thermal load of _____ Gcal/hr, including:
a) For heating, _____ Gcal/hr with an outside air temperature of _____ deg. C;
b) For hot water supply, _____ Gcal/hr at the rates approved by the State Energy Agency of the Kyrgyz Republic Government.
2. Actually heat energy delivered to the USER (if meters are unavailable) for heating shall be determined based on the thermal properties, filler structures, volume of the heated spaces, and outside air temperature, and for hot water supply using the established standards with monthly allocations shown below. When the rate is adjusted, a per capita cost of the space heated and hot water delivered shall be recalculated accordingly.

Quarters	Heat Consumption	Hot Water Consumption		Hot Water Cost	Heated Space Cost
Months	Gcal	ton	Gcal	Som/person	Som/m^3
1st Quarter:					
January					
February					
March					
2nd Quarter:					
April					
May					
June					
3rd Quarter:					
July					
August					
September					
4th Quarter:					
October					
November					
December					
Total for the year:					

3. The SUPPLIER shall control the temperature in the delivery line of the water heating network in accordance with the approved temperature profile, based on the average outside air temperature, by adjusting heat medium flow rate 2 times per day (at night and during the day).
4. The SUPPLIER or a company engaged in maintenance shall perform hydraulic flushing and repairs (in basements, for heating systems with basement distribution, or in attics, for heating systems with overhead distribution) on heat supply systems and heat points (lifting assemblies) of a residential building once a year, while hydraulic flushing shall be conducted as required.

Attachment 2
to
AGREEMENT
on Heat Delivery to The Public in The Form of Hot Water for
Heating and Hot Water Supply

ACT
on the balance-sheet allocation partitioning
between the USER and SUPPLIER

We, undersigned, the Heat Supply Company _____

(network operators in the heat suppliers, heat utility supply authorities, heat producers,
in-house boiler plants, etc.)
represented by the Director _____ and USER _____ residing at the following address _____, executed this Act to the effect that the balance-sheet allocation partitioning (responsibility boundary in regard to technical state and operation) between the USER and SUPPLIER shall be:

USER CONNECTION CONFIGURATION

SUPPLIER:	USER:
_____	_____
_____	_____

APPENDIX 3

North American and European Electric and Natural Gas Supply/Service Quality Measurement and Incentive Programs

North American Programs

Since its adoption approximately one hundred years ago, public utility regulation in the United States has included as a central feature the requirement that private and municipally owned utilities provide "adequate, efficient, safe and reasonable service". An example of this requirement is Section 1501 of the Pennsylvania Public Utility Code, the substance of which was first adopted in 1913, which imposes the following duties upon "public utilities":

"Every public utility shall furnish and maintain adequate, efficient, safe and reasonable service and facilities, and shall make all such repairs, changes, alterations, substitutions, extensions, and improvements in or to such service and facilities as shall be necessary or proper for the accommodation, convenience, and safety of its patrons, employees , and the public. Such service also shall be reasonably continuous and without unreasonable interruptions or delay. Such service and facilities shall be in conformity with the regulations and orders of the Commission." (66 Pa. C.S.A. S 1501)

Energy Regulators enforced this obligation either directly upon Complaint of adversely affected customers or through the assessment of fines or reductions in permitted rate levels. [2]

Over the past decade, in connection with the restructuring of utility infrastructure industries to establish competitive supply marketplaces, the growth of larger regional and international utility enterprises and the increased use of performance based rate making, increased attention and enhanced programs have been developed to assure the performance of this traditional utility service obligation. For example, a number of states, including Connecticut, Illinois, Michigan, New Jersey, Ohio, Pennsylvania, Rhode Island and Texas, as part of their program to expand wholesale and create retail supply competition in the electric and natural gas sectors, have adopted specific statutes and regulatory programs to assure that performance of this traditional service obligation is not lessened due to the attention being focused upon the new competition. These new statutory provisions, passed as part of the legislation authorizing creation of retail and expanded wholesale competition, typically require the Energy Regulator to develop programs that assure that the quality of the remaining regulated service, i.e. transmission and distribution operations and their related customer service function, are not reduced in quality from those existing prior to the restructuring and competitive market formation.

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[2] See 66 Pa. C.S.A. SS 526, 1505 & 3301 (2000). Also see Ann. Laws of Massachusetts ch. 164 SS 76 & 92 (Supp. 2000); New York Public Service Law S 65 (2000).

Other states, such as California, Massachusetts, New York and Texas, have developed expanded programs to monitor and encourage improvement in utility service quality in furtherance of the traditional obligation to provide "adequate, safe and reasonable service" or in support of their efforts to expand the use of "performance based ratemaking" in place of "traditional cost of service ratemaking". Under "performance based ratemaking", a utility is permitted flexibility in the capital return that it may earn, based upon its success in reducing expenses below those employed in establishing price levels. One of the most widely employed performance based methods is the "rate cap" pricing method, under which a utility's rates are set at a reasonable level based upon cost-of-service analysis, and the utility is permitted to retain a portion of any savings achieved in expense levels as compared to those employed in the cost of service determination, sharing an approximately equal amount with ratepayers through subsequent rate reductions. However, for this incentive rate methodology to be effective, the Regulator must assure that reduced expenses reflect improved efficiency and not merely service quality reduction. Thus, an important component of these incentive programs is generally enhanced monitoring of service quality by the Energy Regulator and a separate incentive program, similar to those described further below, to assure maintenance or achieve improvements in service quality as well as rate reductions during the program.

Finally, enhanced service quality monitoring and improvement incentive programs are often imposed by United States Energy Regulators as a condition to their approval of mergers or the sale of regulated assets to larger regional or international enterprises. Both Customers and Regulators express concern in connection with such mergers that existing service quality will decline if management of the larger and more geographically diverse enterprise shifts its attention or resources away from the local service enterprise. To discourage such shifts and to encourage maintenance or increase of service quality, Regulator's merger approval is often conditioned upon the adoption of service quality measurement standards with associated financial incentives/penalties.

Most State Energy Regulators have for years required that regulated, integrated utilities provide reports on electric service outages affecting any significant number of customers, and some have prescribed by regulation supply quality requirements respecting voltage, frequency and similar matters. Major aspects of the commercial relationship between the consumer and its regulated energy service provider, such as the nature of metering, periodicity of meter reading and billing, and the resolution of billing disputes or errors, have similarly been the subject of Commission regulation. Commissions have also not hesitated to investigate an unusual incidence of service quality complaints, often connected with major storms or events causing extended service outages, and have recently sought to develop performance standards to be applied to evaluate service provider response to such major events or storms.

What is new about the recently adopted or still under consideration monitoring and performance standard programs is their effort to define "standards" upon the basis of which penalties may be imposed or incentives paid "automatically" or after Commission review on the basis of reported service outage or other criteria, and the monitoring and data reporting processes

to obtain the data needed for the program to work. Existing mandatory service quality and billing requirements typically remain in effect and operate in parallel with the new rules.

The procedure used to adopt service quality monitoring and performance standards in the United States is typically legislative rulemaking, with limited if any evidentiary hearings. Under the legislative rulemaking process, the Commission will typically initiate an investigation docket to collect the information needed to define the desired standard and penalty level, and to identify and resolve major issues which control the nature and operation of the standard adopted. After collecting the information (i.e. through a set of interrogatories or informal working group meetings with energy provider representatives), the Regulator or its Staff will propose or request that interested parties propose draft standards and penalty provisions. Parties are permitted to present their proposed standards or revisions to the Regulator's proposal through written comments and to comment upon the standards proposed by others. A draft Staff Report or Commission Order is prepared and submitted to interested parties for comment prior to final action. If a proposed standard appears beneficial and sufficient data or experience exists to permit its fair implementation, the Regulator may adopt it for immediate implementation. Otherwise, it may require the reporting over a several year period of information necessary to evaluate the proposed standard for future adoption, but will not adopt and apply the standard pending collection of that information and its further evaluation. In several states, standards have been adopted, but are not to be applied as the basis for financial rewards or penalties until after a one or two year transition period during which their effectiveness (i.e. their relationship to attainable operating experience) is examined.

Recently adopted U.S. service quality programs have typically had three components: (i) service reliability standards, (ii) customer service standards and (iii) safety standards. The most common adopted standards are the "System Average Interruption Duration Index (SAIDI)", the "System Average Interruption Frequency Index (SAIFI)" and the "Customer Average Interruption Duration Index (CAIDI)", with a fourth standard, the "Momentary Average Interruption Frequency Index (MAIFI)", discussed but not typically adopted due primarily to the cost of its measurement. SAIDI measures the duration magnitude of sustained interruptions (i.e. interruptions which exceed 5 minutes in length) in customer service over the course of a year, while SAIFI measures the number of such outages in a year. Commissions adopting the SAIDI and SAIFI standards alone, typically point to available customer survey data indicating that the frequency and total magnitude of sustained service interruptions is the primary complaint of customers with their electric service, and further note that momentary service interruptions are often a necessary part of electric service operations. MAIFI measures the average magnitude of these momentary (i.e. less than 5 minutes per outage) service interruptions. Additional detail respecting the definition and typical level of these standards are described further in the Glossary of this Appendix.

The SAIDI, SAIFI and CAIDI standards are system or designated operating area wide performance standards. A number of U.S. Commissions also impose a requirement that a distribution utility measure service interruptions (i.e. prepare SAIDI, SAIFI and/or CAIDI measurements) for each distribution circuit, and that it identify and report to the Commission the

worst 5 or 10% of such circuits, or all such circuits with a performance result 300% or above its system average performance. The company is then required to prepare a plan, including any needed investments or maintenance expenditure increases, to improve performance on these circuits to its system average within a limited period of time. One Commission, as an additional customer specific standard, has established specific service interruption targets for customers at each distribution voltage level.

Customer service standards may also include major aspects of infrastructure services which can impact upon the customer's perception of the quality of service he receives or demonstrate service inadequacies, such as number of service complaints referred to the utility for resolution by the Commission's Customer Service Department, time required prior to obtaining a customer service representative at the utility's telephone complaint or information service center, time required to resolve customer complaints referred by the Commission, time to initiate or modify service at the request of the customer, compliance with meter reading and periodic billing requirements in Commission regulations and percentage of appointments kept by utility representatives. Certain Commissions have also adopted as a part of their monitoring program (but not as the basis for financial incentives or penalties) the performance of customer satisfaction surveys, either to measure customer satisfaction with service generally or with specific customer service response activities (for example the complaint resolution process) performed by the utility.[3]

Safety standards adopted are primarily of two kinds. For electric and natural gas utilities, a performance measure for employee safety is adopted: lost work time due to accidents. For natural gas operations, a performance measure directly affecting customer safety, response time for Class I and II odor telephone call notifications (i.e. the Class level denoting the seriousness of the call measured by pervasiveness of the odor), is also imposed, with compliance being measured as the percentage of calls resolved within a several hour period. One Commission has, in addition, proposed a standard which requires electric companies to respond to downed wire calls (having an associated public hazard of electrocution) within a several hour period, and an additional Commission has imposed an incentive program to encourage increased investment by a natural gas utility in cathodic protection of transmission and distribution pipelines as well as to reduce its backlog of unrepaired gas leaks.

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[3] See Re Scottish Power plc, 196 PUR4th 349, 382-383 (Oregon 1997). In its merger plan, Scottish Power agreed to pay a $50 penalty to each residential customer and a $100 penalty to each commercial and industrial customer as to which it violated one of its proposed "customer service guarantees. In defense of the Complaint referral standard, one Commission explained that, to be referred to the utility for resolution, a Customer Complaint had to meet substantive criteria applied by its Staff. As respects customer surveys, another stated that it "considers survey data to be useful as a broad indicator of consumer satisfaction . . . [being] especially helpful in determining the quality of a customer's experience with company representatives", but regards the application of financial incentives to be inappropriate due to the subjective nature of survey responses and their ability to be influenced by the phrasing of the questionnaire. Another Commission requires that transactional survey questionnaires be standardized within the state and reviewed by a state-wide working group containing consumer group and service provider representatives prior to use.

In adopting particularly the service reliability standards, U.S. Commissions have addressed and resolved several substantial issues about how service quality should be measured. For example, is it appropriate for a service quality standard to be established upon the basis of regional or state-wide data rather than the historic performance of the particular utility to which the standard is to apply? Although showing interest in developing regional standards, U.S. Commissions have determined that for the time being, until greater experience with such standards is obtained, use of a utility's own past performance, and either maintaining or improving that performance, should be selected. Utility systems are very different in terms of their design and construction, magnitude of underground facilities, their urban or rural character which affects the density of customer locations and the presence of trees or other causes of service outages, and in the incidence and exposure to storm winds or lightening. U.S. Commission's typically require that service reliability standards be based upon 4 or more years of performance data if available, and that customer service standards be based upon up to three years of data with appropriate weighting for any improvement trends.

A second basic issue is whether the service reliability standard should be adjusted to remove the effects of major storms or other uncontrollable events causing substantial customer outage numbers and duration. Typically, but not always, U.S. Commissions have determined to "normalize" outage standards and the data upon which they are based to eliminate such "major events". A major storm or event is typically defined as one which results in 5 to 15% of a utility's customers experiencing an outage or customer outages are for a minimum of 24 hours or more. Service outages caused by events not-controllable by the distribution service provider (i.e. such as decisions or actions of the Independent System Operator) are also eliminated from the standards. A major difficulty in implementing service reliability standards, and particularly uniform regional standards, in the United States, is "normalizing" the historic data (i.e. if sufficient records are available) to eliminate or render consistent the treatment of "major events" by different energy service providers. Commissions which eliminate "storms and other major events" from the service reliability standard program separately monitor and evaluate distribution service provider response to such events for reasonableness.

Finally, the Commission must decide whether imposition of incentives or penalties are appropriate, in what magnitude and upon what terms. U.S. Commissions have often concluded that available data was insufficient to permit fair definition and implementation of a performance standard to be enforced by financial incentives, or that it was unclear that such a standard would be cost beneficial in terms of the allocation of resources to a specific purpose that it would suggest. Moreover, a number of Commissions have labeled their "performance standards" as the "minimum acceptable" level of performance at the present time, being based upon the utility's own historic performance level. Such Commission's typically place a deadband above this "minimum acceptable" performance level (typically equal to two standard deviations above the measured level), and impose penalties only once this deadband has been exceeded. A utility is

not permitted to earn a reward for improvements in its historic performance under these programs. [4]

Other U.S. Commissions, however, apply judgment to the utility's historic performance to establish a target which requires material improvement in that performance. Where the standard is developed in this way, the Commission will typically establish a symmetrical incentive/penalty reward structure. [5] U.S. Commissions have held that penalties and rewards should be sufficient to provide a meaningful incentive to achieve the desired utility conduct, but that their magnitude should not exceed the value of the improved service sought for the customer. Also, several Commissions have not adopted specific reward/penalty principles or other enforcement provisions as a part of standard adoption proceedings, preferring to develop utility specific provisions in the adoption of each utility specific Performance Based Rate Mechanism or to rely upon their general enforcement power (i.e. the levy of fines or rate adjustments) over regulated distribution service providers in the event of service standard non-compliance.

Two specific service quality programs are discussed below to further illustrate an alternative approach to service quality enhancement incentives and gradualism in program development and implementation. The Texas Public Utility Commission adopted in 1998 an incentive program for service quality improvement applicable to a single utility as the result of substantial customer complaints of inadequate service from that utility. [6] In taking this action, the Commission illustrated a fourth circumstance in which United States Commissions have adopted service quality incentive programs, i.e. in response to substantial and wide-spread customer complaints of deficient service. The Commission employed as its penalty/incentive mechanism under the program the traditional mechanism of reducing the Company's equity return allowance, in this case by 60 basis points. This disallowance was made effective for an approximate two year past period in which the Company's rates remained subject to adjustment and during which the inadequate service operations had continued. For the future, however, the Company was given the opportunity to "recapture" one-half of the reduction (i.e. 30 basis points) if it achieved service quality performance equal to or above standards in three areas adopted by the Commission.

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[4] See Massachusetts Ann. Laws ch. 164 @ 1E which limits the penalty which can be imposed as the result of a service performance program to 2% of a Company's annual transmission and distribution service revenues.

[5] In one State program, the performance standards which the distribution service provider must meet increase by approximately 3% each program year. Also, a two year performance measurement period for financial incentive purposes is adopted to reduce the impact of random outage variation between years and a maximum $18 million penalty or incentive reward may result.

[6] See, e.g., Entergy Gulf States, Inc. Service Quality Issues, PUC Docket No. 18249 (Texas PUC 1998). In adopting this incentive program, the Commission noted the importance which electricity plays in the lives of US customers, stating: "Electricity plays a vital role in our lives. Most, if not all, aspects of our society, including industrial production, commerce and individual lifestyles, are built around a reliable and adequate supply of electrical energy. People have come to depend on electricity being available when they need it." The Commission noted further that state law reflected this importance, imposing a duty to provide reliable service upon electric and natural gas service providers.

To earn the entire 30 basis points back, the Company was required to (i) achieve improvements in the minimum performance levels for SAIDI and SAIFI for its worst performing electric feeders; (ii) improve its performance to and above target levels for SAIDI and SAIFI as an average of all electric feeders; and (iii) improve its customer service performance on five specified items to target values approved by the Commission. These items included (a) billing-error rate; (b) customer connection rate at the call center; (c) timeliness in completing service and meter installations; (d) timeliness in completing line extensions; and (e) timeliness in replacing and/or repairing service and street lights. If it failed to achieve the performance standards in any one of these areas or in all areas, it would not recapture one-third or all respectively of the 30 basis point reduction which could be recaptured. Texas has recently adopted additional service quality standards applicable to all transmission and distribution service providers, including further SAIDI and SAIFI standards, voltage, frequency and harmonics standards.

An additional service quality enhancement program which demonstrates gradualism in the development of these programs is that adopted in New Jersey in July 2000. This program was developed through a collaborative process in which a "Reliability Working Group" consisting of service providers, customer representatives, employee representatives, equipment manufacturers and Commission Staff met over a six month period. The program establishes Interim Requirements for service reliability based on a uniform methodology for measuring reliability and quality of electric distribution service. The Interim Requirements will be in effect until June 30, 2002, at which time new Outage Management Systems to be installed by December 31, 2000 will be in place and outage data will have been collected over an 18 month period. This data will be used to define permanent and expected enhanced service quality standards. The installed Outage Management System is required to include a fully integrated Geographic Information System, a sophisticated voice response unit, a computerized outage assessment tool and an energy management system/supervisory control and data acquisition system (EMS/SCADA). This system, once operational, will permit full digital mapping of the New Jersey distribution system, will identify customers without service, the duration of that service outage and its equipment related cause and will improve the ability of the service provider to direct service restoration crews and thereby speed the return of customers to service.

The Interim Standards, which are still under development, include a power quality standard, a program for evaluating service provider response to major storms and other outage causing events, requires initiation of service restoration efforts within two hours for outages which are not "widespread", implementation of a program for identifying and improving service upon the provider's worst performing circuits and established minimum outage number and duration standards (i.e. CAIDI and SAIFI) based upon each utility's historic performance level. Penalties are provided for failure to meet program development deadlines, and (perhaps along with incentive payments) will apply to failure to achieve the enhanced service standards to be developed in the future. Penalties and incentives are not applied to the interim standards to permit a period of data development and evaluation with the new equipment systems. The proposed power quality standard will address waveform irregularities, voltage fluctuations or

spikes, flicker and harmonics issues. Each service provider is required to develop and implement a "Power Quality program" to "prevent, mitigate or resolve power quality problems within the EDC's control to the extent cost-effective and practical."

US Regulators propose substantial annual and, in some cases, quarterly performance and data reporting to permit successful operation of the above programs, and may hold annual proceedings to evaluate the data submitted and asses rewards and penalties for the performance achieved. US Regulators have and continue to expend substantial resources to establish consistent service quality definition and measurement concepts, and reporting standards in order to permit comparisons between service providers as well as between service periods. As respects generation and transmission service quality, the former is deregulated in many US states and is thus not subject to direct Regulator authority. Where generation does remain subject to regulation, specific generator or utility unit performance or system-wide standards are imposed (i.e. availability factor, capacity factor and heat rate). US Regulators also typically require distribution system operators who own or operate transmission facilities to accumulate and report service reliability data , and further require that entities subject to their jurisdiction join and participate in industry groups whose purpose is enhancing generation and transmission service reliability (i.e. the National Electricity Reliability Council and ISOs).

Transmission service quality in the United States is not regulated by State Commissions where provided as a separate unbundled service, but rather by the Federal Energy Regulatory Commission with Texas being the sole exception. In uniform tariff provisions, FERC and the Texas PUC have defined the procedure under which transmission service is to be requested and provided, including forms for the request of service, time periods for responses to such requests, conditions under which service may be refused, notification of available capacity to provide service and the obligation of service providers to conduct studies and make investments to expand service availability. Where a Regional Transmission Operator or Independent System Operator is responsible for transmission system operation, transmission service quality is one of its responsibilities. Earlier this year, FERC opened a proceeding to encourage the formation of RTOs/ISOs and to review possible service quality improvement incentive programs to be applied to transmission service.

European Programs

European Regulators have also developed service quality standards and incentive programs. In connection with its adoption of performance based ratemaking (i.e. RPI-X price control in which prices are established based on forecast, increased efficiency cost levels as in US price cap regulation), the British Regulator has implemented customer specific performance standards whereby a customer may receive automatic "penalty" payments from its service provider if specified "Service Guarantees" (i.e. eleven in number) are not met. The magnitude of these penalty payments can exceed $50 for domestic customers and $100 for industrial or commercial customers. In addition, several "Overall Service Standards" are imposed. Under Section 24 of the British Utilities Act of 1992, an electric or gas distribution service provider is required to conduct its business in such a way as can "be reasonably expected" to achieve

compliance with these Overall Standards. The Regulator may impose financial penalties for failure to achieve such compliance.

Overall Standards address important service quality areas such as security of supply (i.e. # of service interruptions per 100 customers) and availability of supply (# of service interruption minutes per customer, each standard excluding interruptions due to extreme weather); restoration of service to a customer experiencing an unplanned service outage (other than due to extreme weather conditions) for 90% of customers within three hours and for all customers within 18 hours; correction of all voltage faults within a six month period; obtain a "firm reading" of each customer's meter (i.e. either by a meter reader or the customer) at least once each twelve month period; connection of new domestic service customers within 30 days of request; reconnection of customers disconnected for non-payment within one working day of their resolving the non-payment; and changing or resiting meters upon customer request within 10 and 15 working days respectively.

Guaranteed Standards for whose violation automatic "penalty" payments are required, include appearance of provider personnel at the customer's premises within 3 to 4 hours following receipt of a customer service outage or safety related call (including to repair a prepayment meter); a worst served customer standard of no more than five sustained interruptions (i.e service interruptions of greater than three minutes) each year; a substantive telephone response time to customers inquiring about service interruption of 90% of calls answered within 15 seconds unless exceptional circumstances exist (i.e. severe weather) when the standard is 80% within 30 seconds; installation of a meter for domestic and non-domestic customers within two and four days respectively after the request; provide an estimate of the cost of connecting a new supply or moving a meter within 5 working days or 15 working days if significant rewiring is required; provide notice of planned (i.e. non-emergency) service interruptions for repair or maintenance five days prior to the interruption; and offer an appointment with the customer within seven working days or provide a written explanation within five working days to investigate or explain a voltage or meter error complaint. Both the number and required performance levels of Overall Standards and Performance Guarantees have been increased over the years, with the above description reflecting the current or soon to be implemented standard levels.

In order to enhance the incentive value on service quality issues, the British Regulator has recently initiated an "Information and Incentives Project" to review alternatives to revise and expand this portion of its regulatory program. Employing legislative rulemaking and workshops with industry participants, the Regulator is considering how to design and implement beginning in April 2002 several new or alternative service quality standards. To date, it has concluded that standards which are subject to financial incentives should be limited to promote transparency and effectiveness. It has defined three principles to govern its standard design process as follows: (i) the magnitude of incentives and penalties should not exceed the value to customers of the service quality improvement which the standard is designed to obtain; (ii) that service quality standards must apply to matters within the control of the distribution service provider; and (iii) such measures must be capable of objective measurement over time and across companies. An

avowed purpose of the new program is to examine the extent to which service quality measurements can be made on the basis of comparisons or "yardstick" analysis employing the results of other companies. [7] To respond to the objection that such comparisons are unfair because of differences in equipment, characteristic or weather in different service territories, the British Regulator has proposed that service quality data be collected, not on a company wide basis, but rather by discrete operating areas which have similar characteristics and will facilitate comparison of service quality across companies.

The Regulator has indicated its intent to design standards based upon the number and duration of sustained service outages per customer (i.e. SAIDI & SAIFI); a standard for substantive telephone response time to a service outage inquiry call; is considering the development of a transient service interruption (MAIFI) or voltage depression standard and a new penalty/incentives structure with symmetrical penalty/incentive imposition, deadbands and a collar imposing a maximum penalty or incentive. The service quality standards selected are based upon customer survey data indicating that customers view these items as of greatest importance. As part of the standards design process, the Regulator has been reviewing the consistency of data collection and categorization and the accuracy of reporting by service providers. It has noted the same difficulties noted above by American commissions, and has indicated that substantial improvements are needed before the new standards can be made effective.

The Spanish Regulator has established service quality programs for both transmission and distribution service. Transmission Providers are responsible for assuring the availability of their facilities and receive an incentive payment when the availability is above 97%. The System Operator is responsible for the continuity and security of electric supply.

For distribution service, quality standards are established by Province and regional areas having similar characteristics: urban, semi-urban, concentrated rural and dispersed rural. "Thresholds" are established for "TIEPI", 80th percentile of "TIEPI" and "NIEPI" for each such regional area. TIEPI equals the length of total interruptions equivalent to the full load of the area that occurs in a year. The 80th percentile is that full load time of interruption value which is not exceeded by 80% of the population centers in a provincial area. NIEPI is the number of interruptions occurring in a year which are equivalent to the area's full load. The thresholds for each area characteristic (i.e. urban through disbursed rural) are set forth in Appendix 6, and range from 2 to 18 hours for TIEPI and from 4 to 15 interruptions for NIEPI per year. Distribution Service Providers are required to implement improvement plans in order to achieve the thresholds in areas where they are not being met.

Service thresholds also apply to individual customers measured both in time and number of interruptions. These limits for each of the four types of service areas, stated at median and lowest permitted value, are set forth in Appendix 6. The permitted median number of hours of

[7] The British Regulator has indicated that it will consider the use of customer survey data in the new program, but not as a basis for direct penalty or incentive imposition.

interruption ranges from 4 to 16 and the lowest permitted from 12 to 24. A 10% discount on annual service charges is permitted customers where the number or total time of interruptions exceeds the lowest permitted value for tariff and other eligible customers.

Standards also exist for " product quality " including harmonics, flicker and voltage. The permitted variation in supply voltage is plus or minus 7%. Weekly and special incident data collection and investigation under defined procedures is required. The causes of any unsatisfactory product quality must be corrected. A number of customer relations standards have also been adopted. Required response times from the date of customer inquiry are established for the following: (i) preparing price quotations for new supplies; (ii) installation or configuration of facilities needed for new supplies; (iii) installation and connection of metering equipment; (iv) response to customer complaints; (v) reconnection of service; and (vi) responding to inquiries about the tariff. A payment must be made to customers in the event one of these standards is violated in the higher of PTA 5.000 or 10% of the first full billing.

The last pages of this Appendix provides a graph and a chart depicting quality electric service quality in Spain measured in TIEPI over the past six years. All service quality data is audited and made available to the public.

The Norwegian Regulator, in connection with its performance based rate program, is seeking to develop a service quality incentive program based upon contracted payments by service providers whenever service has been interrupted above a certain level and is attributable to preventable causes.

Similar service quality standards (i.e. Guaranteed and Overall Standards of Performance*)* have also been developed and are applied in France, Portugal and Ireland.

Appendix 4

UNITED STATES SAMPLE SERVICE QUALITY STANDARDS

Service Reliability Standards

System Average Interruption Duration Index (SAIDI): In the Texas Program applicable to the Entergy service territory adopted in 1998 by the Texas Public Service Commission both "minimum adequate index values" and "target index values" were adopted (See Appendix page 25 for discussion). The minimum index value established for the Entergy service territory was 315 minutes (5.25 hours) per year. The target value which Entergy (i.e. the distribution service provider) was to strive to achieve within a specified period was established as 158 minutes (2.63 hours). SAIDI values in less rural areas and in service territories which lack the service quality problems existing in the Entergy territory at the time of the Texas Commission's Order have generally been in the 67 to 82 minute range (i.e. up to 1.35 hours) in the United States.

System Average Interruption Frequency Index (SAAIFI): In the same Texas Program, SAIFI minimum adequate index values were established as 3.8 interruptions per year with a target index value following planned improvements of 2.6 interruptions per year. In the New York State Service Quality Program, a less rural area not experiencing significant service quality problems, minimum adequate index values ranged from 0.006 interruptions per average customer per year in New York City and 0.7 to 1.4 in suburban and upstate urban and suburban areas to 2.25 and 3.0 in rural and far northern areas with less underground lines and more severe weather. [8]

Customer Average Interruption Duration Index (CAIDI): In the New York Service Quality Program, CAIDI minimum index values range from 1.12 to 3.75 depending upon the service characteristics of the operating territory (with the highest being in New York City) and objective index values equal 0.89 to 2.75. The New York program establishes service quality indices for five to eight operating territories within each utility service territory, which standard will vary depending upon the service characteristics (i.e. rural vs. urban; supply service problems due to generation or transmission inadequacy; weather; etc.).

Customer Service Standards

Telephone Response Time on Calls to Service Provider Call Center: 85% of repair service calls, calls to business offices and other calls answered within 30 seconds (Texas Entergy Program), with other states adopting similar standards such as 80% of calls answered within 20 seconds.

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[8] Proceeding on Motion of the Commission as to Proposed Changes to the Standards on Reliability and Quality of Electric Service, Case 96-E-0979 (1997).

Response to telephone or customer inquiries requiring written investigation: 10 business days

Response to Customer Complaints referred by the Commission to the Service Provider for resolution: 3 business days initial response to all such Complaints and final resolution of all such Complaints in 30 days

Response to Customer Complaints brought directly to the Service Provider by the Customer: 5 business days

Billing Error Rate : 5 actual customer over-billing errors per 1000 customers

Visits to customer premises to investigate metering accuracy or voltage complaints (10 business days) or resiting meters and providing estimates for significant repair work (15 days)

Restoration of supply within 4 hours of notice of interruption for 85% of calls, and all calls within 24 hours

Service installation: 90% of applications for new electric service and meters not involving line extensions or new facilities shall be filled within 5 working days as measured on a quarterly basis

where line extensions and new facilities are required, 85% of applications shall be completed within 60 working days measured on a quarterly basis

Light replacements: 90% of all customer reports of security and streetlight outages corrected within 48 hours as measured on a quarterly basis

Safety Standards
Response to Class I and Class II Odor Calls – one hour or less for 95% of calls
Total # of Accidents/Illnesses of employees per 200,000 hours worked: 12.5 to 13.5 hours

Other
United States incentive programs have also dealt with matters which have a longer term effect upon service quality. For example, New York recently adopted an incentive program establishing target and minimum mileage for implementing a cathodic protection program for natural gas distribution lines over a four year period. Cathodic protection prevents corrosion of certain types of steel pipe, thereby significantly extending service life and reducing maintenance expenditures. Cost of equity penalties or up to 7.0 basis points and rewards of up to 6.0 basis points are awarded if the miles of pipe protected in each year of the four year program are above targeted or below minimum levels. A separate 5.0 basis point cost of equity penalty program was established to apply if the service provider failed to complete certain other safety and reliability projects, including repair of pipeline gas leaks. Finally, and as will be explained

further in the "Developing Competition in Electricity and Natural Gas Wholesale and Retail Markets", the Commission also established an incentive based reward program (i.e. cost of equity incentive of up to 200 basis points) if the service provider achieved certain goals respecting implementing natural gas supply competition in its service territory, including customer transfers to competitive suppliers and customer knowledge of competition procedures and opportunities.

Appendix 5

Quality of Service in Spain, Commissioner Juan Ignacio Unda Urzaiz, Comisión Nacional de Energía

Slides presented at theCommittee Meeting in Moscow, October 10-11, 2000

CONTINUITY OF SUPPLY

AREA QUALITY (FOR PROVINCE)

- Urban area: >20.000 supplies including capital cities
- Semi-urban area: between 2.000 and 20.000 supplies
- Rural area:

- Concentrated rural area: between 200 and 2.000 supplies
- Dispersed rural area: < 200 supplies and supplies sited outside the centres

(*)Industrial estates will be consider in the main population centre of municipality where are sited

MEASUREMENT

- TIEPI: length of time the interruption lasts equivalent to the installed capacity at MW
- 80 PERCENTILE OF TIEPI: value that is not exceeded by 80% of the population centres defined in the provincial area
- NIEPI: number of interruptions equivalent to the installed capacity (t>3 min)

LIMITS	TIEPI (NUMBER)	80 PERCENTILE (HOURS)	NIEPI (HOURS)
URBAN AREA	2	3	4
SEMI-URBAN AREA	4	6	6
CONCENT. RURAL AREA	8	12	10
DISPERSED RURAL AREA	12	18	15

CONSEQUENCES OF FAILURE: DISTRIBUTORS MUST IMPLEMENT IMPROVEMENT PLANS IN ORDER TO REACH THE SET THRESHOLDS

INDIVIDUAL QUALITY

Measurement. Distributor shall have a system to record incidents
Time of interruption
Number of interruptions

Limits		**Nº hours MV**	**Nºinterr.MV**	**Nºhours LV**	**Nºinterr.LV**
Urban area		4	8	6	12
Semi-urban area		8	12	10	15
Concent. Rural area	12	15	15	18	
Dispersed rural area	16	20	20	24	

Consequences of failure: discounts if the failure is with the number of hours or the number of interruptions for tariff and eligible consumers, with the top limit of 10% of the annual billing.

RELATIONS WITH CUSTOMERS

Measurement and limits. Commitments are established for:

- Preparing price quotations for new supplies
- Setting up the facilities needed for new supplies
- Connecting and installing the metering equipment
- Complaints
- Reconnecting
- Informing about the tariff

Consequences of failure:

Compensation of the higher of the following amounts either PTA 5.000 or 10% of the first full billing

4th Annual Regional Energy Regulatory Conference for Central/Eastern Europe & Eurasia

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Bucharest, Romania

Series of Licensing and Competition Related Issue Papers

PAPER NO. 2
DEVELOPING COMPETITION IN ELECTRICITY AND NATURAL GAS WHOLESALE AND RETAIL MARKETS – THE CHANGING ROLES, TASKS AND RESPONSIBILITIES OF THE REGULATOR

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PAPER NO. 2: DEVELOPING COMPETITION IN ELECTRICITY AND NATURAL GAS WHOLESALE AND RETAIL MARKETS – THE CHANGING ROLES, TASKS AND RESPONSIBILITIES OF THE REGULATOR

1. Preface

1.1 For many years, Energy Regulators and their Governments have been examining the appropriate role for competition and Regulator established incentive mechanisms in electricity and natural gas marketplaces. In many countries, it has been decided that consumers are not benefited if all functions of traditional electric and natural gas utility service are maintained in protected monopoly status. Traditional utility services and the organizations providing those services have been restructured to establish and encourage competition between service providers. Where competition is not possible, some Energy Regulators have sought to develop and apply regulatory methods which employ incentive mechanisms which replicate where possible the competitive process.

1.2 This paper focuses upon the process and methods for developing competition in Electricity and Natural Gas Wholesale and Retail Markets, and particularly the changing roles, tasks and responsibilities of the Energy Regulator in participating in the development and maintenance of those Markets. In addition, regulatory methods which employ incentive mechanisms for application in Market areas where competition is not possible will be introduced. This paper will also summarize presentations made to the Committee on the current experiences of CEE/Eurasia countries with competitive markets and by United States and European Regulators on the Regulator's role in market establishment. Finally, the appendix to this paper contains additional discussion on several market development topics in which Committee members showed specific interest. This paper does not represent the views of any particular Committee Member or the Committee as a whole, but has been prepared by its author and the views stated are solely his.

2. Background to the Development of Competition in Electricity and Natural Gas Markets

2.1 Decisions and Actions Required of Governments in the Development of Competitive Markets – An outline of the decisions and actions required of Governments, in which the Regulator will typically assist, as drawn from World Bank presentations and USAID experience, include the following:

(a) Development of a National Electric and Natural Gas Sector Structure which can support competitive markets, including unbundling integrated monopolies into separate generation, transmission, dispatch and distribution market participants and completion of a proper privatization program.

(b) Creation of a Regional Transmission Organization or National Transmission Service Organization to provide functions essential for market operation including resolution of the following issues:

-Achieving needed independence for this entity from other market participants and the Government.

-Defining the responsibilities of this entity which may include enforcing transmission access, transmission operation and dispatch, transmission expansion planning, transmission congestion management, operation of one or more auction energy markets and other matters, or will these responsibilities be divided among several organizations.

-Defining the geographic scope of the operations of this entity, whether on a regional basis, a national or a multi-national basis.

-Defining the role of this entity vis a vis the Regulator and National Competition Authorities, including its governance structure and corporate form.

-Defining how the costs of this entity will be recovered in the market place.

(c) Establishment of a Regional or National Market Place for electricity and natural gas supply including the following decisions:

-on the mix of transparent auction in bid markets (including day ahead, hour ahead and real time dispatch markets), allowance of bilateral contracts and futures/forwards markets through which end-users, distributors and aggregators may purchase their energy supply.

-on whether ancillary services will be procured competitively by bilateral contract, bid market or other means.

-on how the market will be monitored to assure its competitiveness and to identify exercises of improper market power, and what enforcement tools and penalties will be used to discourage such activities.

-development of uniform environmental, nuclear safety, taxation and other regulatory standards to assure equality of opportunity throughout the market place and needed consumer protections for the transition period until a fully competitive market is achieved.

(d) Development of a transmission pricing methodology both for intra-national transmission movements and cross-border energy trade including:

-selection from amongst alternative principles which have been employed in transmission pricing, including postage stamp, license plate, contract path and distance based methods.

-development of an effective transmission congestion management system, including administrative control to protect short-term system reliability and perhaps incentive pricing methods to mitigate or eliminate congestion for specific transactions or over an extended period.

(e) Development of transparent, non-discriminatory Cross Border Capacity Allocation Rules and methods of notifying market participants of the availability of capacity to be purchased.

(f) Development of a Grid Code, Market Rules, Tariffs, Operating Procedures and other needed documentation for the operation of the Market and its governance organizations.

2.2 Traditional Energy Regulation - Traditional energy regulation was developed on the belief that electricity and natural gas are “natural” monopoly services. By this it is meant that, because of the large fixed investments required to provide these services, society cannot afford and markets will not support competing service providers. Each service provider has an incentive to reduce price to attract customers to fixed investment capacity even though the price level falls below that required to attract needed new capital and maintain existing service. To prevent this “destructive competition”, under traditional energy regulation, a government guaranteed monopoly on service provision is granted a single integrated supplier (providing generation, transmission and distribution) who then commits to

provide reasonable and adequate service at reasonable rates to the public subject to review by a government established Regulator. Appropriate price levels are determined employing "cost of service" principles, i.e. by periodic Regulator review of the service provider's operations and determination of its needed revenue levels. This method of regulation has been criticized in that it provides only limited incentives, i.e. possible disallowance of costs by the Regulator and the lag imposed by the review process in cost recognition, to service providers to identify and implement cost reductions which benefit consumers through price reductions.

2.3 Competition and Incentive Regulation in United States and Western European Energy Markets - Over the past 15 years, in both North America and Western Europe, Energy Regulators and Governments have been developing methods of regulation and for structuring energy markets that provide stronger incentives for both cost reduction and service improvement to benefit consumers. A competitive market place provides incentives for improvement from the fact that an existing service provider can be replaced by a new provider with a better product. Both the existing and possible new providers are "incented" (i.e. encouraged) to improve their product or reduce their cost to attract the consumer's business. Energy Regulator imposed incentive regulation seeks to replicate the functioning of a market by employing a method of regulation which permits the service provider to share in the savings that his improved performance creates or to earn rewards from improved service quality. The service provider is thus given an "incentive" to identify and implement changes in his operations which produce the savings or improve the service quality which benefits consumers.

3. Status of Electricity and Natural Gas Market Development in the United States, Western Europe and CEE/Eurasia

3.1 Overview: Electric and Natural Gas Service was traditionally provided in North America and Europe through an "integrated" service provider, i.e. a single privately-owned company or government entity that produced the supply of electricity and natural gas; transmitted that supply from the production source to the end-use market; distributed that supply to the point of actual end-use; and then metered, billed and collected for the provision of all of these services. That "monopoly" provider was the only legally authorized provider of each of these services in an established service territory. In North America, regulation of this service has been performed at both the federal and state level through the Federal Energy Regulatory Commission and State Energy Regulatory Commissions (i.e. the principal members of NARUC). In Europe, service was generally provided by government owned entities with some exceptions.

3.2 United States Competitive Market Experience: North American and European Governments and their Regulators have concluded that certain electric and natural gas services may be provided competitively and thus obtain the benefits of competition induced cost savings and service quality improvements. These services are those provided in the generation/supply and billing/metering areas. Transmission, dispatch and distribution services continue to be viewed as most cost-effectively provided by a monopoly service provider. Dispatch services in North America are increasingly provided by a non-profit market organization called an Independent System Operator (ISO) and alternatives for the ownership and operation of transmission facilities are being reviewed. Under American state

law, integrated, monopoly service providers (i.e. primarily in the electric market) are being required or encouraged to divest existing generation assets to permit formation of competitive wholesale supply markets and competitive retail suppliers are being licensed to provide service. Customers who have switched suppliers in four States who have fully opened their markets (i.e. but only for a one to two year period), measured by the load that has switched compared to total load, range from 8 to 28%. A greater percentage of industrial and large commercial than residential and small commercial load has switched to alternative suppliers. Early price decreases for customers from the switch to competitive markets ranged from modest to 20%, but such decreases have been substantially offset in recent months by increasing basic fuel costs.

In the Natural Gas markets customers have for a number of years been permitted to contract directly for supply with producers and separate, competing retail suppliers are being licensed and supply related services (i.e. such as seasonal and short-term storage) are being made available to end-users and the new competing suppliers. Futures contracts to reduce the risk of price volatility from reliance on short-term spot markets are offered for several regional electric and natural gas markets. Substantial merger and consolidation activity has occurred in both the electric and natural gas sectors, and involving companies in each sector. At least four major acquisitions of US Companies by European concerns are completed or in process.

3.3 Western Europe Competitive Market Experience: Competition in the furnishing of electricity was initiated in Europe in response to the adoption by the European Parliament and Council of Directive 96/92. The initial market opening to competitive suppliers for customers with annual usage of 40 GWH or greater occurred in February 1999 (i.e. approximately 23% of total EU market demand). By 2003, the Directive requires that 33% of market demand be open to competitive suppliers. Most Community members have exceeded the required minimums with the result that the estimated percentage of EU market demand open to competitive suppliers in June 2000 exceeded 65%. The Directive grants EU member states several options in the "liberalization" of their markets, the principal of which include (i) obtaining generation through a "tender" or "authorization" process and (ii) adoption of third party transmission access for multiple generation sellers and buyers or a single buyer model. Third party access may either be mandated by a Regulator or obtained through private party negotiations. Nearly all EU member states have chosen to implement the tender process for acquiring generation and third party access for multiple buyers and sellers of generation, with primarily Germany choosing to leave the terms of third party access to private party negotiations. Member states are permitted under the directive to impose "public service" duties on energy providers and transporters, including requirements to functionally unbundle and separately account for different service operations, to ensure service reliability, the provision of non-discriminatory service and environmental protection. The extent of managerial and accounting separation of electric supply and distribution functions in member nations varies greatly, as does the level and meaning of public service obligations which have been continued. A number of countries have or will shortly sell major government owned assets to private owners as a part of the market development process (i.e. Great Britain, Italy, Portugal). Estimates of early market price reductions since the Electricity Directive's effectiveness are between 7 and 20% but, as in the United States, have been reduced by recent fuel price increases. As in the United States, there have been or are

proposed extensive mergers and acquisitions of major energy (primarily electric) suppliers both within and increasingly across national boundaries.

The EU Natural Gas Directive went into force August 10, 2000. Member states were at that time required to have implemented legislation and regulations to provide the market's structure and a minimum 20% market opening. The majority of members met the Directive's deadline and total EU market opening achieved is well in excess of 20% (trade press reports state 60%), though disagreements exist over whether actions taken by several major member states are in full compliance.

Further description of the alternatives available under the EU Directive for implementation of competition in EC countries is provided in Appendix Item 1.

3.4 CEE/Eurasia Background: In CEE/Eurasia, electricity and natural gas service facilities were traditionally owned by the state with service provided by a Ministry or other government established and owned organization. Most CEE/Eurasia countries have restructured their electric service providers to separate into different state owned joint stock companies their generation, transmission, dispatch and distribution facilities and services, and many are considering or actively pursuing privatization of non-nuclear generation and distribution assets. Services which are viewed as best provided by a monopoly continue to be provided through state-owned facilities (i.e. transmission and dispatch). The ownership structure being adopted permits and encourages competition in generation and at least the wholesale supply of electricity. Wholesale electricity markets have been created in Kazakhstan, Ukraine and Georgia. Regional electric system coordination and integration, including the development of competitive supply markets, are being considered throughout much of CEE/Eurasia, including particularly Centrel, the Baltics and the Balkans. Private bi-lateral contracts for the purchase and sale of electricity are permitted in Moldova, Kazakhstan and
Georgia. A number of countries have deregulated supply prices from small hydro plants.

CEE/Eurasian countries are also examining privatization and restructuring of natural gas assets, but most are dependent upon imported supplies of natural gas from a limited number of supply sources. Thus, the opportunities to create natural gas production and retail supply competition in many CEE/Eurasian countries may be less than in North America and Europe.

3.5 CEE/Eurasia Competitive Market Experience: Committee Members from Ukraine and Kazakhstan made presentations upon the operation of their Wholesale Markets. The Ukrainian Member noted that Ukraine's Wholesale Power Market has suffered from three deficiencies in its operation: (i) the failure of end-use customers to pay for service provided and, as a result, of power distribution companies to pay generation and transmission service providers as required by their supply contracts; (ii) interference with market operations by government agencies on payment and power dispatch matters have exacerbated payment problems and created competitive advantages for some market participants at the expense of others; and (iii) the inability of market managers to correct particularly the payment problem described above. Efforts by the Commission to correct particularly the payments problem by fining and suspending or revoking distributor licenses have proved unsuccessful as other government agencies have not supported the effort by identifying

alternative service suppliers. However, a new law has been passed which expands the Commission's authority to discipline distributors which fail to comply with supply and service payment requirements. The Commission also looks to further privatization of distribution company ownership to Strategic Investors as a means to resolve this problem.

In Kazakhstan, eighty percent of electricity market participants have been privatized to strategic investors. The market includes 52 sources of electrical energy, a transmission company owned by the Government, 20 distribution companies and 40 retail supply marketers who do not also provide distribution service. Competition at the generator level has led to lower cost of generation supply. The Commission recently altered its transmission tariff pricing method to reduce its reliance upon a distance based pricing method, i.e. whereby the transmission rate varies based upon the distance between the point of generation and use. Under the new methodology (adopted April 2000), the tariff is varied only where the distance of the transmission exceeds 600 kilometers and requires a separate payment for the dispatching function. A functioning futures market for electric energy sales has also recently been created. The Government is presently working upon additional enhancements to the market, including particularly the development of a power trading exchange, the establishment of a market operator to operate that exchange (i.e. "KOREM" already established and 100% government owned) and a resolution to continuing substantial customer non-payment problems by introducing a bank based mutual clearing system for electricity supply and service payments.

A major issue with competitive market development in CEE/Eurasia raised in each of the above presentations and discussed by the Committee was the effects of non-payment on market liquidity and even its ability to operate. It was noted that nonpayment is not limited to just business concerns and customers with the ability to pay, but may also include hospitals and residential customers without the ability to pay. In the United States, special funds are provided from the Government budget to assist residential customers with a demonstrated inability to pay for a reasonable level of service. Hospitals, transit companies, water suppliers and business concerns that do not pay can be taken to court and either forced to cease operations and distribute their assets if their non-payments extend to enough creditors, or special court appointed managers can be employed to take over their operations in an attempt to operate them profitably or at least in a manner that permits payment of all creditors. This authority provides an incentive for even needed service concerns (i.e such as hospitals, transit companies, etc.) to choose to pay their energy service and other creditors.

Copies of the presentations by the Committee Members from Kazakhstan and Ukraine are contained in the Appendix Item 3.

4. Incentive Mechanisms applied by Energy Regulators to Electric and Natural Gas Monopoly Services

4.1 Dispatch, transmission and distribution services continue to be provided by a monopoly service provider in North America, Europe and CEE/Eurasia. Western Energy Regulators have developed incentive mechanisms to apply to these services to, in part, induce the cost savings and service quality improvements which the discipline of competition would otherwise be expected to induce. These mechanisms, as applied to distribution service, establish price levels on the basis of cost of service determination but permit a sharing of any

savings achieved from the established price level between the service provider and ratepayers. For example, a multi-year rate program (i.e. typically 4 to 5 years) will be established with the initial price set on the basis of a cost of service determination. Subsequent year prices will be reduced during the program period from the initial year's price on the basis of a negotiated allowance for expected cost efficiency improvements. Any efficiency induced cost reductions achieved beyond the negotiated level will be shared equally or upon a skewed basis which favors ratepayers (i.e. the ratepayer share exceeds 50%) between investors and ratepayers during the multi-year period of the rate program and perhaps for some period thereafter. A "collar" is typically imposed whereby savings will not be shared if they exceed a certain level, and a minimum and maximum allowed profit level is also established at which prices will be adjusted upward or downward to assure no fundamental unfairness to investors or consumers. Price levels in these programs may be adjusted to prevent savings or cost non-recovery in specified, non-controllable circumstances, i.e. particularly to permit collection of increased taxes applicable to the service provider. Service performance standards are also typically established as a part of these programs to assure that cost reductions are truly efficiency induced and not the result of service quality deterioration, and a separate rewards/penalty structure designed to induce maintenance or improvement of service quality may be established. The British Regulator has also developed and applied incentive programs applicable to transmission and dispatch service providers and the development of such programs is being examined at this time in the United States.

The British programs define annually for the coming year future expected cost levels for transmission services (including certain ancillary supply services) and establishes these as revenue targets for the year. The service provider is permitted to retain a percentage of any savings achieved from these targets and may recover only a portion of costs which exceed these levels, unless certain costs which are excepted from the program increase (i.e. principally taxes).

5. Issues Experienced and Actions Taken by United States and European Regulators in the Development of Competitive Electricity and Natural Gas Markets.

5.1 Presentations made to the Committee on United States and European Market Development: Presentations were made to the Committee on United States and European Market development by two United States and one European Commission Representatives.

United States Commission Representatives described the status of competitive wholesale and retail markets in the United States as well as certain of the major issues faced by the Regulator in market development. They emphasized the need for clear legislation to provide a legal basis for market development and operation (i.e. the importance of which was also emphasized by the Committee Representative from Kazakhstan in her presentation), and for cooperation and participation by all interested parties in the regulatory process by which the markets are defined before the Regulator. They also noted an interesting feature of the Texas statute which creates the markets in that it limits the share in the deregulated generation market permitted any one market participant to twenty percent (an approach also recommended by the European Commissioner). They also emphasized the importance of adoption by the Regulator of adequate customer protections during the transition to a competitive market, noting that markets require a time period to mature and to attract

sufficient competitors after their initiation. These protections, in the United States, have included price caps on both supply and monopoly transmission and distribution service costs for a five and even ten year period after market initiation. Finally, they noted that successful market development requires both care and careful coordination both in defining customer price cap protection mechanisms, the "price to beat" or "shopping credits" (see Appendix Item 2(d)) and the terms and period of any stranded cost recovery.

The European Commissioner explained that Spain has had a System Operator since 1986, has two existing auction markets – a day ahead market and an hour ahead market and is considering establishment of a futures market. Although a competitive wholesale market has existed for some time, retail competition is being phased in and will not be completed before 2003 under current law. Spain has a separate System and Market Operator and the Commissioner carefully explained the differences in their functions in his presentation (See Appendix Items 2(a) & (b)), and also explained Spain's system of determining and recovering stranded costs from end-users. Separation of the System and Market Operators in Spain (and in Texas and California in the United States) has been adopted under the view that market operation involves commercial interests and judgments that could interfere with impartial system operation decisions. Several U.S. Regional Markets, however, have not adopted this reasoning, arguing that combining the functions reduces cost and improves the effectiveness of both system and market operations (PJM, NY & NE ISOs).

The United States Commissioners emphasized the importance of a competitive wholesale market as a predicate to implementing retail market competition, and described the several consumer protections which several U.S. States adopted as part of their market development process including the recent development of Uniform Business Conduct Rules for competitive market participants. They also described a concept adopted in a number of U.S. States of a non-bypassable "Public Benefits" charge which provides funds to continue Commission programs in energy efficiency and renewable energy as well as a separate requirement of mandatory environmental effects disclosure on generation service providers. (See discussion at Appendix Item 2(f))

It should be noted that each of the Markets described in the above presentations are succeeding in attracting new generation investment as follows: Texas – in excess of 40,000 MW; Spain – approximately 26,000 MW; and New York – approximately 32,000 MW. Additional comments by each presenter on specific issues faced in the development of their markets are included in the discussion below. Nevertheless, each Commissioner noted that significant market problems remained to be confronted in their jurisdictions, either due to the thinness of the market, limited market participants and isolation from broader regional markets or due to load pockets. (See further discussion in the Appendix)

5.2 Issues Experienced and Actions Taken: Developing competition in electricity and natural gas markets requires the Energy Regulator and National Political Leaders to address and resolve a number of technical, social and political issues. Employing the experience of North American and European Regulators in the development of competitive markets, those issues are discussed in the paragraphs below. Where indicated additional explanation is provided in the Appendix.

(a) Developing a Consensus which Supports Competition: The pricing and delivery of electric and natural gas services by competitive rather than regulated or

government owned suppliers is a major change in an important infrastructure industry. It is a change which requires careful consideration and debate throughout major government organizations, including Ministries and Parliament as well as the Regulator. In the EU, this change was thoroughly debated by both EU and member country political organizations prior to adoption, and its basic form was established by a formal document adopted by the EU Parliament and Council. In the United States, electric and natural gas competition has been debated before Congress and in State Legislatures, and is supported in most (but not all) instances with legislation. In addition, competitive provision of electric and natural gas services requires different skills from consumers than does regulated or governmental provision of such services. Most State Commissions in the United States have developed extensive programs of consumer education to assist consumers in the transition to a competitive marketplace.

(b) Market Governance, Operations & Transparency: North American Regulators have participated in and supported the development of market organizations including Independent System Operators and Power Exchanges to manage market and transmission system operation. Although each of these organizations is in many ways unique, they share a number of common characteristics. Governance is in part or entirely by a Committee comprised of market participants with membership and voting requirements established to reflect the extent of market participation by each participant class and the significance of the issue to be voted upon. Technical Committees on major areas important to market operation, such as reliability or operations, report to this Committee. A permanent professional staff, headed by an independent, self perpetuating Board, also possesses significant governing authority. In addition to performing dispatch functions, assuring operating reliability, monitoring long-term supply reliability and preparing transmission system expansion plans, these organizations may operate auction style market structures which establish wholesale market supply prices by matching supplier and purchaser bids, provide ancillary services needed for system operation and resolve disputes between market participants

To operate effectively, markets require transparency of information flow and procedures which permit interested sellers and buyers to agree upon quantity, price and other service terms. Regulators can be instrumental in mandating transparency and in reviewing market structure to assure its fairness to the broader public which it serves. In the United States, FERC has required, implementing proposals developed by market participants, that information on the availability, magnitude and price of transmission capacity be posted on "oasis" web sites in order that all market participants may know what capacity is available for purchase and requires that an opportunity to make purchases and sales electronically be present. Market structure is generally developed through collaboration of market participants and has resulted in the development of specific market organizations, such as ISOs and Power Exchanges, whose governance and structural provisions are described above and have been subject to Regulator review.

Additional discussion of United States approaches to the creation and characteristics of market and dispatch management organizations is set forth in Appendix Item 2.

(c) Transmission System Access, Congestion Pricing & Rate Policy: North American Regulators have encouraged or required transmission system access for third party buyers and sellers of electricity and natural gas. A "postage stamp" rate which encourages market transactions through out a maximum market area has been developed and applied by

FERC. "Pancaking" of transmission rates, i.e. the development of rates based on less than the maximum realistic market area, is discouraged. Such rates would encourage local transactions as compared to those over greater distances due to the imposition of the additional rate charge. North American markets are often "defined" by traditional "power pool" boundaries which may include several states. Such power pools were developed in North America over fifty years ago to enhance reliability and the economic exchange of power between integrated service providers. Transmission connections within power pools are often much stronger than between power pools because supply and transmission planning was done in common and to provide reliable service to all pool members. This fact often provides a de facto definition of market boundaries. FERC generally requires establishing a single transmission rate applicable to any service provided within or across the transmission grid of that power pool.

Congestion pricing is designed to require transmission users to pay, as a part of their costs of transmission service, the additional costs experienced as the result of congestion from service requests on highly requested transmission paths. Although different congestion pricing methods have been suggested and employed in North America, the most prevalent is Locational Marginal Pricing and most systems are similar in principle. LMP imposes a charge to account for congestion related costs based on the differential in bus-bar electricity cost between the generation purchase and distribution sale location. In order to avoid over-recovery of transmission costs, this charge is refunded to transmission service users but on a basis different from its imposition in order that it achieve its incentive function.

(d) Ancillary Service Markets: This subject is discussed further in the Appendix Item 2b. Ancillary Services generally relate to services required to maintain and balance the system or to assure service reliability, such as generation black start capability, generation spinning reserves, reactive power and similar matters. An ISO or RTO is generally responsible for obtaining these services. In States which have established auction markets, such a market is typically used for the purchase of these services. However, because these services can only be provided from generation properly situated geographically to provide the service, market power is often a concern in adopting market approaches to obtaining these services.

(e) Allocation of Scarce Supply and Capacity: Both generation and transmission capacity can be in scarce supply. Methods may need to be developed to allocate existing low cost supplies and must run generating station costs. Moreover, although market price can be relied upon to encourage the construction of new generation capacity, a competitive service, transmission remains a monopoly service and price cannot be relied upon entirely as the mechanism to encourage new construction. Pricing methods have been developed, primarily locational marginal pricing, to reflect in pricing transmission path congestion, but with a total cost of service revenue cap to the transmission owners. ISOs also perform studies of "redispatch" and transmission capacity expansion cost which a market participant may choose to pay to obtain service otherwise unavailable due to constrained transmission capacity. Also, in the United States, issues of land use and environmental impact have resulted in state regulation of the siting and construction of new generation and transmission plant. But in a regional market, generation and transmission plant must often be constructed to benefit states other than that in which its adverse land use and environmental effects are felt. Thus, it may be necessary to develop regional organizations to conduct siting and environmental reviews of the construction of new generation and transmission facilities.

(f) Transitional Issues: The transition from a regulated or government owned electric or natural gas system to a market system requires extensive changes in the

commercial and operational relationships that have traditionally delivered this service to consumers. It is not unreasonable for Government and the Regulator to conclude that these changes should be examined through pilot programs prior to adoption and should be phased in over several years. Both of these techniques were used in North America and Europe in the early process of market formation and implementation, but have become less pronounced in later movements as the process of implementation has become better understood. Because market competition often reduces prices from regulated levels, a number of equity issues can arise in phase in and pilot program approaches. For example, industry and commercial users who are included in the pilot or early market served groups in a phase-in can obtain advantages over competitors in their markets even if the program is carefully developed. Additional transition concerns have involved assurance of supply and price level pending maturity of the competitive market (i.e. establishment of sufficient experienced and financially capable competitors). Thus, most United States market transition plans include a requirement that the monopoly distribution service provider offer a supply service as "the provider of last resort", that the provider of this service be determined in an auction or that this service requirement be allocated amongst all licensed providers and further provide for some period during which both supply and total service costs are capped at a cost of service determined price. Price or bid caps have been adopted in a number of United States wholesale markets to prevent customers from experiencing improper price levels due to extreme or immature market conditions. Additional transitional cost issues, including stranded cost determination and the "shopping credit", are discussed further in Appendix Item d. Also, Europe and several American states (a minority) have decided to initiate competition with larger industrial or commercial customers.

Also in North America, it has been necessary to harmonize State taxation of competitive services and property used in providing those services, as failure to do so could lead to economic advantages for low tax states in attracting new, primarily generating plant facilities. Both North America and Europe have established reciprocity requirements under which service providers not within the jurisdiction adopting market competition are permitted to participate in the market only if their jurisdiction also adopts market competition principles. This requirement is imposed to prevent injury to one state or country's jurisdictional service provider where a competitor with a closed, monopoly service territory will, because of this fact, have an unfair competitive advantage.

Finally, Regulators must define competitive and monopoly services in deciding to adopt competition, and may also be required to determine the boundary between even monopoly services which have been unbundled and are to be provided by different companies. For example, in North America, there have been disputes and Regulator decisions required on the service boundary between generation and transmission and transmission and distribution. Regulators have also been required to review primarily distribution services, and particularly metering and billing services, to determine if they should be competitively provided. This last issue is further discussed in Appendix Item e.

(g) Monitoring Market Operations and Consumer Protection: Energy Regulators and Market Organizations, such as ISOs, may also perform market monitoring to assure that a reasonable level of competition is being achieved. This monitoring includes evaluating market structure and operating procedure to determine if modifications will increase the vigor of market competition. In the United States, ISOs are also charged with evaluating whether market participant conduct is in furtherance of competition or destructive of it and in

resolving through arbitration certain disputes between market participants. Destructive competition may include withholding generation or transmission capacity from the marketplace without a physical reason for doing so (i.e. such as the need to make repairs), engaging in bidding irregularities or providing commercially sensitive information to affiliates in preference to other market participants. Prior to market initiation, studies may be performed to determine the existence or absence of market power based upon transmission bottlenecks or the concentration of generation plant ownership in one or several market participants hands. Both monitoring and enforcement actions against anti-competitive conduct may be shared with or substantially reserved for the jurisdiction of antitrust or specialized competition agencies.

The establishment of competitive markets also does not eliminate the need for Energy Regulator protection of various small consumers. For example, under regulation, Energy Regulators, through approved tariff terms, establish the specific terms of the service contract between the energy service provider and smaller commercial and residential customers. The Regulator also provides a staff and decisional process to assist in resolving customer complaints with service, terminations, billing and other matters. These services continue to be provided as to monopoly services after competitive supply markets are developed, and, in some states, have been continued at a lesser level or for an interim period as to competitive services. For example, the Regulator may develop a sample service agreement by which smaller customers may sign up for competitive services, and may license such service providers. The purpose of such licensing, however, is generally to assure that the provider has a base level of financial strength and experience to provide service, rather than to evaluate the relative capabilities of the possible service providers or to limit their number. The licensing process is considerably less extensive than that engaged in by NIS/CEE Regulators.

(h) Assuring Universal and Reliable Service: Energy Regulators remain dedicated to assuring both reliable and universal service after the development of competitive markets. Existing programs to assist primarily low-income customers to obtain and maintain service are continued, including government and other assistance programs, winter termination curtailment, termination notice and complaint resolution programs. Care is taken to assure that either a market based organization (i.e. the ISO), the Regulator, a service provider or a dedicated industry organization (i.e. such as the United States National Electric Reliability Council) adopts rules and procedures for assuring both generation supply and transmission system operating reliability.

(i) Maintaining Renewable Energy, Energy Efficiency, Conservation and Environmental Protection Programs: Many North American Regulators have supported expanded use of renewable energy, energy efficiency, conservation and environmental protection through pilot, rate or other programs. Many of these initiatives are being continued, but with care taken in their application to assure that they create no competitive advantage or disadvantage in their administration. Support for these objectives may take the form of mandating a specific percentage use of renewable energy in future supply operations or rate programs to encourage investment in such technologies or in conservation and energy efficiency. A non-bypassable charge may be imposed upon all end-users (whether served by a competitive or former monopoly supplier) to produce a fund to be used at the Regulator's direction to support these programs. Suppliers may also be required to identify and publicize to both existing and prospective customers the extent of harmful environmental emissions released during the production of their electricity portfolio.

(j) Establishing Code of Conduct and Affiliate Relationship Limits: Most energy service providers in North America and Europe have affiliates active in several service functions, i.e. generation, transmission and distribution, and often in the same markets. Where a service provider may acquire or sell goods to an affiliate, the shareholder of that provider may benefit as compared to a sale to a non-affiliated company, and further may benefit at the expense of the customer if the price of the transaction is higher or lower than necessary. For this reason, North American energy legislation typically requires the regulation of such relationships and the Regulator has established rules and reporting requirements applicable to such transactions. Those rules include a requirement that the price of such transactions must be at or below book and market value for purchases, or above such value for sales if the latter benefits consumers. North American legislation authorizing energy markets also may restrict the magnitude to which affiliates may participate in different energy service functions to enhance competition in those markets.

6. The Changing Roles, Tasks and Responsibilities of the Regulator in developing a Wholesale or Retail Supply Market

6.1 Roles, Tasks and Responsibilities of the Energy Regulator under Traditional Regulation: Under traditional regulation, the Regulator establishes and enforces service quality standards, designs and monitors the mechanisms for providing universal service (including particularly service to low-income persons) and defines through the Tariff terms and conditions the commercial relationship between the customer and the utility, including service terminations for non-payment. The Regulator must also collect cost of service information and periodically establish the price of service (i.e. ratemaking), assuring that the rates established are fair to ratepayers and shareholders, result in necessary cost recovery, equitably allocate costs between service users and encourage efficiency in the use of the regulated service. The Regulator also may be requested to act to define and protect the monopoly service, including supporting the authorized service provider's efforts to prevent unauthorized, competitive service. Finally, the Regulator supports its own and initiatives of the Executive and legislative branches of government on matters within its jurisdiction, as well as providing staff and dispute resolution procedures to assist customers on service and other matters under its jurisdiction.

6.2 Roles, Tasks and Responsibilities of the Energy Regulator in the Development and Monitoring of Competitive Markets: The Energy Regulator must perform in competitive market development and monitoring most of the same functions as are stated above applicable to Traditional Regulation. After all, the Regulator remains responsible for continuing traditional regulation over transmission and distribution as well as perhaps certain other assets. However, the magnitude of costs and the complexity of this traditional function, as it does not involve the generation function, is reduced. However, the Regulator will be required to engage in significant new functions related to market design, monitoring, evaluating and encouraging competition in its policies and decisions.

As New Jersey Commissioner Butler explained at the Committee's June Meeting, an Energy Regulator can be required to be a Referee, an Innovator, an Educator, a Service Quality Monitor, a Dispute Adjudicator, an Ambassador to the Executive and Legislative Branches of Government, and a "Command and Control" Regulator. In some measure, all of these functions are present under both traditional and market competition directed energy

regulation. However, in the development of competitive markets, the Regulator is much more a Referee, an Innovator and an Educator, and much less able to "command and control", than under traditional regulation.

Finally, Commissioner Unda of Spain, in expressing his perspective on the role of the regulator in the development of competitive markets, explained that the Regulator must be "hands on now, hands off later". By this, Commissioner Unda meant that the Regulator should be directly and substantially involved in market design, in resolving transitional issues and in customer protection while the market remains immature and not fully competitive. However, once the market has achieved robust competition and start-up problems are resolved, the Regulator should resist the temptation to continue oversight and involvement at a level which precludes market functioning.

Appendix

This Appendix provides (i) additional information on the status of competitive market development under the European Electricity Directive, (ii) additional explanation of market processes or Regulator actions in the United States indicated to be of interest to Committee Members and (iii) copies of the presentations made by two Committee Members on the operation of existing CEE/Eurasia energy markets. The specific United States market processes or Regulator actions explained include the following: (i) governance procedures and structures of market organizations; (ii) provision of third party access and ancillary services in a competitive market; (iii) evaluating and responding to market power; (iv) stranded cost determinations, shopping credits and rate caps; (v) competition in metering and billing; and (vi) provision of reliable service, low-income customer protection, environmental protection and other public benefits in competitive markets.

Item 1. Additional information on competitive market development under the european electricity directive

The following provides a more detailed explanation of the options permitted under the European Electricity Directive to satisfy its requirement of electric market restructuring. Under the Directive's "authorization" process for obtaining new generation capacity, a member state publishes criteria for authorization and will grant it if the published criteria are met by any applications received irrespective of whether or not the capacity is needed. Under the tender process, the state establishes the need for new capacity and issues a request for its construction. An appeals procedure is provided to ensure objectivity, transparency and non-discrimination in both cases.

Member states designate transmission system and distribution system operators responsible for both operation and development of their respective high and low-voltage systems. These operators are not permitted to favor any of their affiliated supply function companies. However, preference may be given to electricity produced from indigenous fuels (up to a limit of 15% of domestic consumption), to energy produced from renewables or central heat plants which also provide a steam heat service.

Under negotiated third party access producers and consumers contract with each other and than negotiate access terms and prices with the transmission and distribution operator. Indicative tariffs must be published by the operator annually, "good faith" negotiations to achieve agreement are mandated and a dispute resolution procedure is provided. Access can be denied because of lack of capacity or on grounds of public service obligations, but the latter must be in compliance with EU law and can only be for reasons of supply quality, security and reliability, and to achieve environmental protection.

Under regulated third party access, published tariffs approved by the Regulator establishing the terms and cost of access are provided. Under the Single Buyer Model, producers and consumers may contract with each other and the single buyer, an entity appointed by the member state to manage transmission/distribution and or centralized

purchasing and selling of electricity, is obliged to purchase the electricity contracted at the buyer's own sales price, minus its published tariff for use of the network. Single Buyers are subject to the same unbundling requirements as other integrated entities, including managerial and accounting separation between production and transmission/distribution activities. Provision is made for Stranded Cost recovery and generation and natural gas asset divestiture is occurring.

In May 2000, the European Commission announced an accelerated plan for creation of an integrated European Market for electricity with the focus upon the creation of an international rather than 15 individual company markets. The Commission will focus upon increasing the number of electricity customers eligible to choose their supplier, will facilitate greater unbundling of operational and accounting aspects of the diverse power sector and will improve regulated third party access to the network. Specific proposals to achieve these objectives are to be made later this year.

The "Florence Process" involving European Regulators and member governments has developed a framework for addressing three issues critical to a more integrated market: cross-border pricing, market transparency and congestion management. A provisional cross-border pricing mechanism is to enter into force on 10/1/2000, to be applied initially for one year. This pricing mechanism provides for compensation payments between operators for the costs arising from cross-border transit of electricity. Payments are to be made to a neutral fund administrator who will distribute the funds collected to individual market system operators based on a cost causation formula yet to be determined. More specific proposals are anticipated later this year. Further proposals respecting congestion management are to be made respecting the allocation of scarce transmission capacity and congestion management costs, with the initial focus to be on identifying, measuring and publishing transmission capacity and bottleneck information.

Further liberalization of the EU Market is to be accomplished while guaranteeing the highest quality of public service, security and reliability of supply and environmental protection. The European Commission also plans to develop a series of "performance indicators" to assess the degree of competition achieved in both the National Markets and the Community Market as a whole. A study is being launched on pricing systems adopted by the member states to be presented to the Stockholm European Council Meeting in June 2001. The Commission has further proposed in a draft directive laid before the Council on 30 May 2000 that a target for renewable energy supply be adopted of 22.1% Finally, the Commission has proposed that the EC enter into regional or bilateral agreements with certain non-member countries on mutual market access and that full reciprocity be required prior to permitting entry of non-member countries into the EC Market.

A number of member states have recently adopted or proposed acceleration of their market opening such that it will be completed by 2003. Stranded costs have also been or are anticipated to be experienced as the result of market opening and are further discussed in the Appendix.

Item 2. Additional Explanation of Market Processes or Regulator Actions in the United States of interest to Committee Members

(a) Structuring, Governing and Regulating Market Organizations

Both European and North American Regulators and Governments have considered the nature of organizations to be charged with market functions. Principal issues to be considered are whether such functions are to be the sole purpose of such organizations or if they can be combined with other functions and how independent such organizations should be of other market participants and the Government. The principal market functions are the provision of transmission access and the operation of any supply balancing or other market. These functions are often combined with transmission system operation, maintenance and expansion and the provision of ancillary services essential to transmission system operation.

EC Directive 96/92 requires that a designated transmission system operator (TSO) be responsible for operation and maintenance of the transmission system, for the dispatching of generators and for ensuring the availability of ancillary services, and for decisions respecting the use of transmission Interconnectors (i.e. transmission interconnections between major load areas). The TSO must either be legally/institutionally separated and independent from generation and distribution asset owners, or must be independent "managerially" and in accounting terms. These latter requirements mean that the TSO must have an independent Staff and budget from market organizations, and must preserve confidentiality of commercially sensitive information. Most European Governments have established institutionally and legally separate entities to serve as TSO, though Germany and France employ a managerially separate division within the existing integrated utilities to perform this function.

In the United States, the Federal Energy Regulatory Commission (FERC) has recently issued a Final Rule addressing many of the matters considered in this Appendix. See Regional Transmission Organizations, 65 Fed. Reg. 810 (January 6, 2000). FERC has declined to require but has strongly encouraged the creation of Regional Transmission Organizations (RTOs), concluding that such organizations can best achieve operating and market efficiencies to lower costs for ratepayers, improve system reliability and provide enhanced assurance against discriminatory conduct by market participants with ownership or other control over transmission assets. FERC has also established certain requirements for an organization to qualify as an RTO, the principal of which is independence from other market participants. FERC approved RTOs are governed either by an independent, self perpetuating board of experts supported by an independent professional staff or by a market participant "stakeholder" board which is structured so that no one market interest controls RTO decision making. Super majority votes are required as to certain matters in order to permit each major market interest (i.e. generators, distributors, customers, etc.) a veto over certain RTO decisions. The independent or stakeholder board is advised by a number of committees made up of market participants, each committee focused on a major activity of the RTO such as transmission operations, expansion planning, market design and operations, finances, etc.

The predominant form of RTO presently existing in the United States is the ISO or Independent System Operator. The ISO is a non-profit limited liability company or corporation without stock capital. The ISO obtains the right to operate transmission plant of certain of its members (generators, distributors and end-users may also be members), but

obtains no ownership interest in that plant. Five ISOs are presently operating. An alternative form of RTO which certain market participants believe to be preferable is the Transco, a for-profit stock corporation. The for-profit feature of the Transco is believed by some to provide greater possibility of efficient transmission system operations and thus reduced cost for customers through operation of the profit incentive.

FERC has concluded that, so long as its specified requirements related to RTO functions and characteristics are met, it will accept either an ISO or Transco as an appropriate RTO. Consideration is being given at the present time to the formation of several Transcos, but various US tax rules render their formation more difficult than ISOs. In the Final Rule, FERC established four "minimum" characteristics for an RTO: independence, scope and regional configuration, operational authority and short-term reliability. Independence means independent of market participants. To achieve this characteristic, the RTO, its employees and any non-stakeholder directors must not have any financial interests in any market participant, the RTO's decisional process must be independent of control by any market participant or class of participants and the RTO must have the exclusive and independent authority to file changes to its transmission tariff with FERC. The latter effectively requires that the RTO fully control the price, terms and conditions of transmission service and facilities it controls, including third party access, subject to FERC's regulatory jurisdiction. Active ownership interests in RTOs by market participants will only be permitted for a five year transitional period, though interests which are proven by periodic compliance audits to be passive will be permitted indefinitely. Scope and regional configuration require that a TRO's control of transmission plant be of sufficient regional coverage to permit achieving the efficiency inducing and market development purposes of the RTO, which FERC concludes supports a region which is large in scope. FERC further notes that certain of the responsibilities of the RTO, including reliable "available transmission capacity" calculations, avoiding pancaked rates and resolving loop flow issues, require that RTOs be of the largest practical size in terms of load and geography.

Operational authority refers to the requirement that the RTO have operational control over transmission facilities within its region, and must be the security coordinator for that region (i.e. the entity which ensures reliability in real-time operations for the region's power system). Finally, the RTO must have exclusive authority for maintaining the short-term reliability of the transmission grid under its control. This includes exclusive authority to confirm and implement all interchange schedules, to order redispatch of any generator connected to the transmission system it operates if necessary for reliable operation and the authority to approve all transmission outages.

FERC also established eight minimum functions of an RTO including that it perform Tariff Administration and Design for transmission facilities under its control, that it perform congestion management functions on transmission facilities it controls, resolve parallel path flows, obtain ancillary services, prepare and maintain Oasis sites (i.e. internet sites) upon which Total Transmission Capability and Available Transmission Capability calculations are provided, that it conduct market monitoring activities, the planning and expansion of the transmission network and all required interregional coordination. Several of these functions will be further described below. The maintenance of Oasis sites deserves additional comment here however. An important element of any market is knowledge of what, in this case generation and transmission capacity, is available for sale. FERC requires that transmission

owners and operators must post on an internet site contemporaneously with its availability the total of particularly transmission capacity that is available on their system for sale. Absent this requirement, and the companion requirement that this information not be available on any other basis to any market competitors, including generation or distribution affiliates of the transmission service provider, the market could not exist since no market participants would have knowledge of the most important goods available for sale- transmission capacity. FERC has also prohibited the release by transmission providers to affiliates or others, or the improper use of commercially sensitive information obtained while transacting to provide transmission service. [1]

FERC further emphasized in Order 2000 that RTOs must develop and apply market mechanisms to manage transmission system congestion, particularly mechanisms which provide price signals to market participants respecting the congestion related consequences of their transmission system usage decisions. Although it does not mandate a particular form of mechanism, FERC notes that locational marginal pricing with a separate market for tradable fixed transmission rights is becoming the principal approach used to address congestion management in the United States.

Finally, FERC addressed the goals of its transmission pricing policy, noting that these goals are to support effective market development. Elimination of rate pancaking and development of market based congestion management mechanisms further these objectives. FERC notes that it is receptive to consider and will itself pursue Performance Based Rate mechanisms applicable to transmission services.

FERC and State Commissions have recently ordered significant modifications in market structure in one of the United States earliest markets (i.e. the California Market) to enhance competition and perhaps reduce recent price levels experienced in that market.

(b) Provision of Third Party Access and Ancillary Services in North America

FERC required third party or open transmission access in wholesale electric markets in the United States in 1996. [2] Such access is required to be provided pursuant to a Pro Forma Tariff whose terms were defined in a Rule (FERC Order 888) issued in 1996. These terms include a definition of two different forms of service (i.e. network and point to point), the process by which service is to be requested, the conditions of full utilization of transmission capacity pursuant to which service may be denied and the priority afforded different forms of service in utilizing scarce capacity (particularly service provided to "native load", i.e. a former transmission utility's franchise customers). Under these procedures, it is recognized that service may often be provided over otherwise constrained transmission lines after system "redispatch" or if capacity enhancing improvements are made to the system. A procedure is provided to examine the cost of these options and allow the proposed service customer to determine if it wishes to bear a properly allocable portion of their cost in order for service to be provided. Transmission owning utilities in the United States formally filed and FERC reviewed tariffs with the terms and conditions specified in the Pro Forma Tariff

[1] See Open Access Same Time Information and Standards of Conduct, 61 FR 21,540, Order 889 (May 10, 1996).

[2] See Promoting Wholesale Competition Through Open Access Non-discriminatory Transmission Services by Public Utilities and Recovery of Stranded Costs by Public Utilities and Transmitting Utilities, Order No. 888, 61 FR 21,540 (May 10, 1996).

and containing rate terms to recover their costs of providing the required transmission service. FERC has subsequently permitted transmission service providers to delay or suspend both firm and non-firm transmission service in order to prevent overloading of transmission lines. The service provider must follow a NERC procedure known as "Transmission Loading Relief" procedures to take such action. Network service is broader than point-to-point service, permitting transmission service to multiple generation and/or load use sites for a single cost whereas point-to-point service can be obtained only from a single generation to a single end-use point.

Ancillary services are services closely related to basic electric transmission service and which are needed to provide that service. They can range from services required to effect the transaction (i.e. such as scheduling and dispatching services) to services necessary to maintain the integrity of basic transmission service during the transaction (i.e. such as load following and reactive supply). FERC required in 1996 that six such Ancillary Services be provided by transmission service providers under their open access transmission tariffs as follows: (i) scheduling, system control and dispatch service; (ii) reactive supply and voltage control services from generation sources; (iii) regulation and frequency response service; (iv) energy imbalance service; (v) operating reserve/spinning reserve service; and (vi) operating reserve/supplemental reserve service. The transmission service provider is not required to physically provide the service from its owned or leased plant facilities, but must obtain the service from those able to provide it. As the services are generally related to the operation or availability of generation plant capacity, the services are often obtained through the same or related auction market processes as is power supply.

(c) Evaluating and Responding to Market Power

Market Power determinations are important to Regulator determinations to approve proposed mergers of service providers and requests to employ market based rates in the wholesale market. Market based rates are not permitted if the service provider can influence the level of those rates (i.e. they will not be determined solely by market forces) and mergers are not permitted where they will result in undesirable concentration in service provision or buying power. State Regulators also often direct that such evaluations be performed prior to permitting competition in retail markets.

The basic form of such evaluations is taken from the Horizontal Merger Guidelines which was developed by the United States Department of Justice. Two matters are reviewed. First, whether the service provider owns or controls essential facilities to market operations as to which market forces are unable to establish prices. Such facilities are, of course, represented by transmission and distribution plant which remain subject to regulation and are generally placed under the control of an RTO (i.e. transmission plant). Where the latter occurs, FERC has concluded that the facility owner is not able to use its ownership of the facility to influence price and no market power exists. Second, the concentration of buying or service provision power is reviewed through the use of a mathematical index known as the Herfindahl-Hirschman Index. To apply this Index, the market affected by the merger or service provider seeking market-based rates must be defined and the concentration of buying or service provision capacity must be measured. The market share of the participant whose market power is being measured is then squared, and if greater than certain specified values is considered potentially a competitive concern (i.e. in the range of 1000 to 1800 and with a change due to the merger in excess of 100) or clearly a concern (in excess of 1800 and the change due to the merger exceeds 50). Where the Herfindahl-Hirshman Index suggests

reason for concern respecting market power, a merger or market-based rates will not be approved unless conditions can be imposed or other actions taken to alleviate the competition related concerns. Market power analyses will also look at specific major transmission lines or isolated load pockets to determine the effects of mergers in reducing competition to supply customers through those lines or in those pockets. RTOs are further expected to monitor market operations to identify instances of improper conduct by market participants, such as withholding available generation from the market to game an auction market, and to penalize such conduct. If possible, the RTO will also look to alter market rules or operations so as to prevent such conduct from occurring in the future.

Although in the United States these considerations have typically been addressed as a matter of approving a service provider proposed action, Regulators in developing economies have occasionally required divestiture of distribution or generation assets where markets are found to be becoming too concentrated as the result of privatization or other factors. [3]

(d) Stranded Cost Determinations, Shopping Credits & Rate Caps

In North American Regulation, Stranded Costs are costs whose recovery would be permitted under Regulation but are unlikely to be achievable under the desired competitive supply market. Stranded Costs typically consist of four categories of items: (i) generation investment, maintenance or operation costs which exceed costs which could be recovered in a competitive market as existing generation is uneconomic as compared to currently available technologies or basic fuel costs; (ii) long-term supply purchase agreements with costs which are similarly uneconomic; (iii) costs whose recovery have been deferred under regulatory accounting principles and which must normally be recovered through prices on a current basis in a non-regulated setting; and (iv) other costs which may relate principally to costs incurred to initially establish the competitive market. A critical determination in defining Stranded Costs is a comparison of the monopoly service provider's supply costs to those anticipated as the result of the desired competitive supply market. Where future supply costs are anticipated, even in a competitive market, to be above existing costs because full cost recovery (including recovery of capital) is not now being achieved, Stranded Costs from moving to a competitive market from the initial two items above will be minimized or non-existent.

Stranded Costs are recovered through a non-bypassable charge under North American Regulation. The charge is applied in a way not to effect end-user consumption decisions and further so as not to effect the decision to take service from the old monopoly or new competitive supply providers. In other words, the Stranded Cost recovery charge must be paid regardless of who a customer selects as its future service provider and is typically paid over an established several year period. Stranded costs are a significant cost of moving to competitive markets in the United States and there actual level may vary from that estimated at the time of competitive market initiation.

Stranded Costs are also present in the European Union's move to competitive supply markets. EU Member States were required to identify potential stranded costs in filings to

[3] See, e.g., Argentina Orders Endesa to exit one of Buenos Aires Two Distributors, Electricity Week International (8/21/00); ANEEL: Light/Metropolitana must trim share of Brazil Distribution market, Electric Utility Week International (7/24/00).

the European Commission in October 1998. All Member States but Finland, Italy and Sweden did so. Significant stranded costs were experienced in Great Britain and Spain's move to competitive markets and were recovered also through a non-bypassable fee over an approximate eight year period. The European Commission has issued specific guidelines identifying five permissible types of stranded costs for recovery: (I) irrevocable fuel and power purchase agreements; (ii) renewable, CHP & indigenous fuel commitments, (iii) investments beyond the usual course of business imposed on electricity undertakings, (iv) decommissioning of nuclear waste costs which have not been provided for in prior rates, and (v) investments made into economically doubtful generation capacity based on guarantees of operation and the assumption of a captive market.

Shopping Credits are the costs saved to a former monopoly provider or provider of last resort under a State retail access program where the customer chooses to obtain his supply from a competitive supplier. Essentially, this is the base cost of electric supply without transmission or distribution charges. The level of this credit is important as it determines whether competitive suppliers can offer attractive service options to customers. If set too low, customers are encouraged to remain with their former monopoly supplier as no service cost reduction is obtained from competition. If set too high, however, customers remaining with the former monopoly provider/current provider of last resort are required to subsidize service to customers who participate in the new competitive market place as the latter's non-competitive services are underpriced (i.e. transmission and distribution costs). Some states have deliberately set this credit at a lower level initially and planned to increase it gradually over time as a means of gradually expanding retail competition in their States.

As the US Commissioners explained in their presentation to the Committee, the determination of a price cap and the period it will remain effective, the magnitude and recovery period for stranded costs and the "shopping credit" level are all related and affect the incentives that both end-use customers and competitive suppliers have to participate in the market. The level of stranded costs to be recovered may necessitate a longer period for their recovery or a higher price cap if a short period is desired. The shopping credit establishes the price against which an alternative supplier must compete, and if set too low, will retard the development of competition.

One additional feature of North American retail competition experience worthy of special mention is the role of the "Aggregator". Aggregator's are retail supply provider's who will take on the responsibility of obtaining supply for a homogenous or heterogeneous end-user group. For example, all schools in a given County or State, or all auto dealerships or dry cleaners may contract with an Aggregator to buy their retail supply from that Aggregator. The Aggregator will then contract with a generator or other wholesale supplier to obtain the required supply, which will normally be at significantly reduced cost because of the Aggregator's ability to purchase in bulk because of its aggregating the small supply requirements of each of its customers into a much larger supply purchase. A number of examples of significant savings from this mechanism can be cited from US retail competition experience.

(e) Competition in Metering and Billing

One area of traditional utility service which has been viewed by several State Commissions as potentially amenable to provision by competitive suppliers is billing and

metering services. [4] It is believed that significant savings could be obtained by expanding the availability of interval meters, i.e. meters that permit recording of usage in 15 minute increments as the result of possible customer response to this "time-of-use" information and pricing of power to recognize differences in its cost by time of day. With this information, customers would have the ability to evaluate the time related costs of electric usage and alter their usage patterns to lower cost periods. The major impediment to this activity, however, is the need to install and the cost of interval metering as compared to the savings obtainable. In addition, automated remote metering is being considered in a number of utility service territories and competitive provision of this new technology may reduce costs, though it may also eliminate desirable economies of scale in having this technology provided by a single supplier.

Several Commissions have, therefore, permitted the competitive provision of metering, meter reading and billing services for customers large enough to potentially achieve cost savings in excess of the costs of the more sophisticated metering. The size of customer permitted to take advantage of this competitive service need not be specified by the Commission, but where it is has generally been established in the 20 to 50 kw demand range. California and New York have also been considering the use of "load profiling" to permit smaller customers than the limit specified above (i.e. those for whom the installation of interval metering is clearly not economic) to take advantage of this competitive service. Under load profiling, a customers time differentiated electric use pattern is determined based on load research data, his characteristic and appliance profile rather than actual metering. Extensive load research data collection is ongoing to determine the viability of this approach.

Permitting competitive metering and billing raises a number of issues requiring Commission resolution. First, standards for acceptable metering equipment, installation and reading/processing personnel or licensing requirements to assure accuracy and interchangeability between competitors is required. Second, both the competitive supplier and the distribution & transmission utility will now be providing service and each will want to bill directly to establish their relationship with the customer. However, the customer may not desire to receive two bills. Most Commissions have therefore permitted customers the option of separate or consolidated bills, with the latter provided by the distribution utility or and in some states also the supplier. Where metering and billing is done by the competitive supplier, the distribution utility is required to provide a credit from its otherwise applicable charges.

(f) Provision of Reliable Service, Low Income Customer Protection & Environmental Protection

Much attention has been provided to maintaining the provision of reliable service under competitive market conditions. In the United States, prior to the development of competitive markets, reliability was provided pursuant to rules and procedures developed by voluntary industry associations, but whose application was subject to regulatory oversight. This system worked well because market participants, primarily vertically integrated monopoly service providers, had similar and at least non-conflicting economic interests and Regulator established prices encouraged the investments needed to maintain reliable service.

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[4] See, e.g., Re Proposed Policies Governing Restructuring California's Electric Services Industry and Reforming Regulation, 177 PUR4th 386 (Cal. PSC 1997); Re Competitive Opportunities Regarding Electric Service, 194 PUR4th 129 (NYPSC 1999).

Under competition, the price establishment structure is being changed in ways which may reduce these incentives and the similarity of interest between market participants in reliable service as compared to cost reduction may be reduced.
Thus, United States Regulators and the Government are reviewing carefully new, mandatory options for reviewing and promoting reliable service, including legislation presently being considered by the United States Congress. Moreover, as noted above, one of the principal functions of new RTO organizations is to assure reliable short-term transmission system operation as well as monitoring and planning to maintain reliability over the longer term.

Maintaining Universal Service, i.e. low-income customer protection, is a further significant objective addressed by United States Regulators in the development of a competitive supply market. Regulators are establishing new or continuing existing procedures to identify, with the aid of Government assistance programs, customers in need of assistance and mechanisms for providing that assistance. Winter and other limitations on service terminations, customer complaint procedures and the development of basic commercial conditions for fair service provision continue to be defined and enforced by Regulators as to monopoly services and in some matters as to competitive services as well. Use of the service termination procedure for monopoly services is generally limited to the recovery of costs related to those services and not competitive services. Competitive service providers are licensed to assure their technical and financial capability to provide service.

Careful attention is also provided to preventing competition from reducing environmental protection in electric supply production and delivery. In the United States, this function is largely beyond the direct involvement and control of Utility Regulators, and is overseen by separate Environmental Regulators. Under Regulation, the costs of environmental protection became a part of cost of service rates and were recovered from end-users. This reduced a Generator's incentive to seek to avoid these costs and reduce the protection of the environment at its facilities. Under competition, however, an economic incentive for such reductions potentially exist in that reduced protection may mean reduced costs which permit lower market bid prices while still achieving higher profits. Assuring that all Generators comply with the same environmental standards becomes an important element of fairness in market structuring.

Item 3a Ukraine Committee Representative prepared Paper on Ukraine Wholesale Energy Market Operations

Why Is the Power Market Not Working?

Problems with the operation of Ukraine's Wholesale Power Market (WPM) during the period of its formation in 1997-99 may be attributed to the fact that the fundamental principles by which it was to function were not fully implemented.

The market's current ineffectiveness is due to the following:

— customers' failure to pay and power distribution companies' failure to perform fully their financial contractual obligations with regard to power purchases have made it impossible for generating companies to purchase fuel for power plants, in turn resulting in inefficient competition between them and higher prices instead of the expected decrease in prices;

— bureaucratic interference by government agencies in payment and accounting relations between market participants and the dependent status of economic and technical dispatching (on account of subordination to a government agency in the electric power industry) have resulted in the creation of competitive advantages for some market participants at the expense of others, unequal terms of competition for power suppliers, a lack of confidence in the market on the part of some participants and, as a consequence, use of non-banking forms of accounts;

— the absence of a mechanism for self-regulation, i.e. a market auditor or arbitrator, the Market Council's failure to perform its designated functions (which has resulted in the subjects of the market losing control over payments in the market and over market participants' performance of their financial contractual obligations), failure to impose fines and other penalties on WPM members who do not meet their obligations, the temporary repeal of the procedure by which oblast power companies were allowed to ensure performance of financial obligations through use of advance payment, and failure to make appropriate amendments to regulations governing the market.

In the situation that currently exists in the WPM, monitoring of distribution companies' compliance with the terms of their licensing with regard to payment for power has become a major focus of efforts by the National Electric Power Regulatory Commission (NEPRC). Consideration of cases involving oblast power company violations of licensing terms and imposition of penalties to force the government-designated guaranteed distribution company to perform its obligations in an appropriate manner have been an ongoing part of the Commission's work throughout 1999 and 2000. As a result, 34 rulings requiring oblast power companies to eliminate violations of the "Terms and Rules for Engaging in Commercial Electric Power Distribution at a Regulated Rate" have been issued, three licenses have been temporarily suspended, and four fines have been imposed in response to violations of laws governing the power industry.

Regarding fines for violation of laws governing the power industry. NEPRC rulings imposing fines for violations of laws governing the power industry were appealed to

Ukraine's Supreme Court of Arbitration, which supports the position of those distribution companies with regard to restrictions on their operations by NEPRC.

Regarding license revocation. The Commission deemed it necessary to revoke licenses authorizing the distribution of electric power at a regulated rate in the cases of four oblast power companies, in view of their systematic violation of the terms of their licensing with regard to payments to the WPM and failure to abide by NEPRC rulings requiring elimination of violations under the terms of their licenses. However, the Commission could not revoke their licenses, as each of the aforementioned oblast power companies has a monopoly within its oblast and under current legislation must provide guaranteed electric power supply to the region in question. After setting a preliminary deadline for revocation of these licenses, the Commission repeatedly appealed to the Ministry of Energy and to the appropriate oblast governments, requesting that they designate companies to provide electric power to the oblasts whose suppliers were to have their licenses revoked. However, as a result of failure by those governmental bodies to submit reasoned proposals with regard to substitutes for the guaranteed suppliers that would not violate current legislation, the decision to revoke the distribution licenses of these oblast power companies was not carried out; the oblast power companies continue to operate in violation of the contract between the members of the wholesale power market and the terms of their licensing.

Regarding license suspension. This action played a positive role by focusing attention on the extremely unsatisfactory status of payments between the oblast power companies and the WPM; however, it not only did not tend to improve the status of those payments, but actually heightened fears regarding the effects of temporary suspension of operations by the oblast power company during the period of license suspension (with regard to continuation of the procedure for purchasing power from the WPM, as well as maintenance of uninterrupted power distribution services to customers, since the law forbids operating without a license).

Thus the idea — seemingly attractive in terms of improving the status of payments — of applying penalties against oblast power companies by suspending or revoking licenses demonstrated the absence of legal and regulatory mechanisms by which to attain a positive result.

At the present time restoration of order in the WPM is being facilitated by legislative amendments designed to force the government-designated guaranteed power supplier to perform its obligations in an appropriate manner. This refers primarily to passage of the Ukrainian law "On Amendments to the Ukrainian Law 'On the Electric Power Industry'" (as it pertains to resolution of power sale and purchase issues and payment for power), which among other things sets forth a procedure governing payments for electricity in the wholesale power market and defines in law the obligations and liability of members of the wholesale power market, i.e. electric power suppliers. Furthermore, this law grants the National Electric Power Regulatory Commission the right to apply penalties to electric power suppliers that violate the terms of their licensing and the stipulations of this law, in the form of warnings, fines, appointment of a temporary manager (or management), suspension of licensing to engage in commercial power supply within the area in question, or revocation of licensing to engage in commercial power supply within the area in question.

It should be noted that in our opinion only the release of the government's stock interests in distribution companies and the formation of unified (controlling) stock interests of greater than 50% of shares for sale through competitive bidding to a strategic investor will make it possible to designate a responsible owner and possess leverage over that owner, up to and including forcible revocation of ownership rights in the event of systematic violation of the terms and rules governing the conducting of licensed operations.

Item 3b Kazakhstan Committee Representative prepared Paper on Kazakhstan - Wholesale Energy Market

The power sector of Kazakhstan consists of a group that includes restructured on functional basis energy generating enterprises, transportation company JSC "KEGOC" and distribution companies. Energy wholesale market includes government as well as private companies. 80% of the energy sources are privatized; management of concession is also handed over. Today's whole-sale energy and power market consists of a system of relationships between energy producers, energy transmitting, suppliers and consumers engaged in buying and selling and transferring electric energy and power.

In 1996 the government of Kazakhstan had decided to reform the government monopoly into generating and electro-networking assets, and thereby creating the preconditions for the development of a competitive power market. To accomplish this task a government program of privatization and restructuring of power was worked out.
Realization of this program created the separation the competitive sector (generation of elector-energy) from the natural monopoly (transmission and distribution of elector-energy) and thus removing the previously existing vertically integrated structure of the government monopoly:

Big Thermal Power stations were sold to strategic investors;

Regional electric and heat generating plants were transferred to the local administration as community owned property (Akimati).

On the basis of the assets of the main high voltage class network; 1150, 500 and 220 KV of a total length of 23,5 thousand kilometers the Kazakh power network management company JSC "KTGOS" was created, on the basis of the regional electric network 110-35 KV and local electric network of 6-10 and 0,4 KV voltage the electric distribution network shareholding company JS "REK" was created.

The main task of the JSC "KTGOS" was to create an optimal structure for the organization and commissioning of the National electric network and create an effective wholesale power market.

The program of further development of the energy market had envisaged the following model:

- Competition of pricing of the supplied electro-energy
- Inclusion of two market levels (whole-sale and retail) of electro-energy
- Organization of sale of power on the basis of two sided buying-selling fixed-time contracts between the market participants, having a timetable of power consumption confirmed with supplier as a mandatory component of this contract.
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The implementation of this market model of power has provided following positive changes in the power sector:

The competitive market of two sided fixed time (futures) contracts has been created and is functioning rather effectively.

The centralized dispatcher administration has undergone restructuring, which has adopted itself to function when the competitive and monopoly sectors of electric energy and power have been separated. The centralized dispatcher administration, a part of OAO "KTGOS", is at a higher level of the dispatcher administration of the Unified Energy System of the Republic of Kazakhstan (UES RK), the regional dispatcher centers, dispatcher centers of the whole-sale consumers are situated at much lower level.

The market of reserve power has been created and is functioning, and it is operated by a pool of electric power reserves (EPR pool). Open access to the energy resources and transmission network is provided, by signing contracts with the participants of the market for purchasing electric energy and providing services in transmission and distribution of electric energy on the interregional network (JSC "KEGOC"), regional and local levels (RECs-Regional Electric Companies).

At present, about 52 sources of electrical energy (including 38-Thermo-EPS, 9-Hydro-EPS and 5-Heat-electric EPS) one transportation company JSC "KEGOC" and 20 distribution companies. Delivery of power directly to the consumers by JSC "KEGOC" consists of approximately 60% of the total transmission volume, 40% is delivered to RECs. As per its position of energy delivery in the energy system JSC "KEGOC" is a natural monopolist, performing the transmission of electrical energy generating sources to the wholesale consumers. Our agency regulates the cost of services provided by "KEGOC".

RECs are assigned the task of providing energy to small whole-sale and retail buyers of the regional market, where the tariffs are determined by Departments of the Agency as a Fee-for-Service for transmitting power through the regional network ("entry tariff" of RECs), and retail tariff for different consumer groups. Besides this, there exists an independent network of power suppliers (traders) who do not have distribution network, present day their number is more than 40. These providers mainly supply electric energy to communal and domestic consumers.

Toughening of competition, among the large Power Stations of National importance, to sell the electric energy generated by them, has lead in certain regions, to substantially lower the delivery price of the power produced by large Power stations. Thus the delivery price of electric energy at Ekibastuz- HEGP-1 (Company AES- Ekibastuz) and Ekibastuz-HEGP-2 (100% shares owned by the Government) is approximately 1,0 cent per 1kW/Hr.

The competition that exists in the wholesale market for electric energy among the largest electric generators was restrained by the existing method of calculating the tariffs for transmitting power along the interregional network, based on the distance of transportation, reducing the appeal to use the transportation system to transmit electric energy over long distances.

Thus, for developing the competition further for the sale of electric energy at the regional retail market between the local TES and large Electric stations of National importance, it was decided to lower the dependence of the tariff on distance for JSC "KEGOC". At the same time, it was decided to lower the dependence on distance in several stages.

The new method introduced in April 2000, unlike the previous one, takes into consideration the limiting effect of the variable of the tariff when the distance of electric transmission is more than 600 km and also assigns payment for dispatching power. In this manner, the precondition was created for separating from the transportation company JSC "KEGOC" the technical and commercial operator of the market.

Experience gained form the functional model of the market, defined by the decision of the Government of the Republic, has brought to light certain shortcomings of the power trade. The main unresolved problems are the following:

Substantial non-payment amounts for the consumed electro-energy, and non-payment also for the transmission and distribution services, that creates low liquidity of the market because of barter buying-selling deals for power and the persistence of low payment discipline of the participants of the market.
Lack of development of normative legal base, regulating the
Different aspects of relationship between the market participants
Absence of transparent centralized market mechanism of
Balancing the production and consumption of power and power in a regimen, close to real time regimen, that requires creation of supply of power (spot market)
Resolution above-mentioned problems demands development of power trading exchange in the Republic, which in turn will permit:

- The creation of a transparent trading mechanism
- Employ indicative prices for disbursement of electric
- Energy by the energy sources for planning the deals with the end users, which in turn is one of the guarantees for them to have a free choice of power providers
- Substantially increase the proportion of direct money payments between the participants of the market
- Provide insurance for commercial risks for non-payment for power by introducing banking mutual clearing system for the electric energy delivered.
- A market operator "KOREM" with 100% government capital has already been created. The main activity of SC "KOREM" is defined as organization of centralized trading of available (spot) and balancing power and power, and also the creation of the market of auxiliary services.

From the beginning of its work the market operator "KEGOC" performs the function of technical operator for the EES RK fulfilling the time table set by the production-consumption of power, managing the regimen of transmission interregional net-work, provide the reliability of the functioning of the EES RK and provide additional services of technical nature.

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SERIES OF LICENSING AND COMPETITION RELATED ISSUE PAPERS

PAPER NO. 3
WHAT WE HAVE LEARNED IN OUR LICENSING/MONITORING PRACTICES

Prepared by
Licensing/Competition Committee
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LICENSING/COMPETITION COMMITTEE PAPER NO. 3
WHAT WE HAVE LEARNED IN OUR LICENSING/MONITORING PRACTICES

1. STATUTORY POWER OF LICENSING/MONITORING PROCEDURES

The first section of the report discusses the different tasks and responsibilities delegated by the statutory power to the regulatory organizations of the Licensing/Competition Committee. Upon review of the various answers from committee members, it proved necessary to list the different tasks performed by the regulators in a table format in order to enable a clear comparison of similarities and differences in the member countries.

However, it is important to be aware of the following comments and additions to the tables below.

The **Lithuanian National Control Commission for Prices and Energy (NCC)** has a special status among the regulatory bodies since to date it has not been authorized to issue licenses to suppliers. However, as of January 1st, 2001 a new Law on Electricity Energy authorizes the Commission to issue licenses for transmission, distribution and supply. At the same time, a governmental authority shall grant licenses to market operators.

The situation in Kazakhstan is rather complex. The **Agency of the Republic of Kazakhstan for Natural Monopoly Regulation, Competition Protection, and Small Business Support** is another committee member not authorized to issue licenses or monitor activities in the field of electricity. The main task of the Agency is to adopt government policies in the field of price setting and development of competition and business. In the Republic of Kazakhstan, licenses are issued by the Ministry of Energy, Industry and Commerce which is also responsible for determination of energy policy. This Ministry has the authority to issue licenses to already existing companies.

The **Romanian Electricity and Heat Regulatory Authority (ANRE)** described a special case in which Government Emergency Ordinance No. 63 regarding electricity and heat authorizes local (city, town and village) councils through the authority transferred to them by ANRE, to issue licenses and authorizations according to ANRE regulations. The types of authorizations and licenses that may be issued are:

1. initiation authorizations for:
    a) attainment of new production, transmission, storage, dispatching and distribution capacities for electricity and heat;
    b) modification of existing energy capacities for production, transmission, dispatch and distribution for electricity and heat;
2. commissioning permissions for:
    a) electricity and/or heat production capacities;

b) electricity and/or heat transmission installations;
c) systems of electricity and/or heat distribution;

3. operating authorizations for:
    a) generation capacities for electricity and/or heat;
    b) electricity and/or heat transmission installations;
    c) electricity and/or heat storage systems;
    d) electricity and/or heat dispatching systems;
    e) electricity and/or heat distribution installations.

Licenses:

1. licenses for *generation* of electricity and/or heat;
2. licenses for *transmission* of electricity and/or heat
3. licenses for ensuring *system (ancillary)services*
4. *dispatching* licenses (system operator and commercial operator)
5. electricity and/or heat *distribution* licenses
6. licenses for *supply* of electricity and/or heat.

The **Energy Commission of Armenia** listed the following task: "Register supply agreements between licensed entities, develop and introduce standard agreements between consumers and distribution companies regarding supply of electric and heat energy, as well as natural gas."

Task performed by agency	Issue licenses*	Issue initiation licenses**	Amend, suspend, withdraw licenses	Determine minimum production limits (standards)	Determine minimum financial and performance indicators	Supervise export-import	Monitor compliance with license conditions and law
Albania	♦			♦			
Armenia	♦	♦	♦	♦		♦	♦
Bulgaria	♦	♦	♦		♦		♦
Estonia	♦	♦	♦	♦	♦	♦	♦
Georgia	♦		♦			♦	♦
Hungary	♦	♦	♦				♦
Kazakhstan							
Kyrgyz Rep.	♦	♦	♦		♦ quality of delivered energy		♦
Latvia	♦		♦				♦
Lithuania							
Moldova	♦		♦				
Poland	♦	♦	♦				♦
Romania	♦	♦	♦		♦	♦	♦
Russia	♦		♦	.			♦
Ukraine	♦		♦	See Note. 1	♦		♦

* licenses for commercial activities: generation, transportation, distribution, supply, dispatching

** construction licenses

NOTES

1. According to the Procedures and Conditions for conducting business involving the electric power generation sector the following parameters are regulated:

a) Businesses generating electrical energy, which own or use power generation equipment with installed capacity no less than 5 MW shall be licensed.

b) All the electric power produced by the licensee's power plant with output capacity more than the minimum and produced at power plants with installed capacity of lower than 20 MW and/or produced at power plants where the total annual output of the electric power delivered to the system was less than 100 million KW, during the previous year shall be sold on the wholesale market.

Task performed by agency	Inspect documents related to licensed operations	Impose punitive sanctions	Approve/consent to significant changes in ownership structure	Supervise the commercial activities of participants	Promote competition	Set wholesale and retail rates	Serve as court of arbitration between licensees and consumers
Albania	♦			♦		♦(Approve and refine methodology)	♦
Armenia	♦			♦	♦	♦	
Bulgaria	♦		♦	♦	♦	♦	
Estonia	♦	♦		♦	♦	♦	♦
Georgia	♦	♦	♦	♦	♦	♦	♦
Hungary	♦	♦	♦				
Kazakhstan							
Kyrgyz Rep.		♦					
Latvia	♦				♦	♦ (approve and elaborate methodology)	♦
Lithuania				♦ (oversee pricing)		♦ (establish principles, check calculations, negotiate prices)	
Moldova				♦	♦		
Poland		♦				♦ (set wholesale rates)	♦
Romania	♦	♦	♦	♦	♦	♦	♦
Russia	♦	♦		♦	♦	♦	♦
Ukraine	♦	♦	See Note 2.				

Note. 2. Regulations and Conditions regarding conduct of business in the electric power industry require all licensees to apply to the NERC to determine if they are in compliance with these Regulations and Conditions in cases of liquidation, reorganization, such as merger, affiliation, participation in associations, as well as purchase or sale of more than 25 percents of total shares, or assets.

When committee members were asked whether they felt there were shortcomings in the current law in the country that required amendment, the majority who provided an answer stated they were satisfied with current relevant legislation..

" The law currently in effect gives NERC broad authority sufficient for efficient licensing and monitoring work." **(NERC Ukraine)**

According to **ANRE Romania,** relevant Romanian legislation is very precise and clear regarding the process of granting, modifying, suspending and withdrawing licenses and authorizations. *(Government Decision No. 567/99)*

ANRE Moldova thinks that a penalty mechanism should be included in their law. A bill requesting amendment has already been submitted to the Parliament, however, it has not been approved yet.

HEO Hungary reported that a new law (an amendment of the existing one) was approved by the government and was sent to the Parliament. This law provides HEO with additional autonomy but price setting remains in the power of the Minister. HEO Hungary is satisfied with its statutory power in the field of licensing/monitoring.

Some suggestions regarding the licensing process were also elicited:

GNERC Georgia would like to see the following addition to their authorized powers:

- To require a company to fire the management if their non-compliance was a result of the company's managing personnel.

- To suspend a license for a specific period without termination of operations it controls and to transfer all revenue for this period to the state budget.

- In the case of non-compliance with the conditions of the license NERC would like to be empowered to apply penalty sanctions.

2. PREPARATION OF OPERATING LICENSES

Question No. 2 asked committee members about the preparation of operational licenses, specifically, who prepared the draft and the final version of these licenses and whether the regulatory organizations discussed the conditions of the licenses with the applicants and with their customers. In addition, they were asked who was authorized to issue licenses to existing companies and how many operating licenses had been issued to date.

According to the responses received, in the majority of the cases the regulator itself was responsible for the draft and final versions of the licenses. This was true in **Bulgaria, Estonia**, **Georgia**, **Hungary, Latvia, Moldova, Poland, Romania, the Kyrgyz Republic** and **Ukraine** where the draft and the final version of operating licenses were prepared by the regulatory authorities. **ANRE Romania** intends to delegate the power to grant authorizations

to local authorities (in the case of small capacities, less than 10 MW). In **Hungary, Ukraine** and **Romania,** license conditions were discussed with the applicants. HEO personnel consulted the applicants and customers' representatives throughout the preparation process. Foreign and domestic advisors were also consulted. **ANRE Romania** has a process allowing negotiations between the authorizing agency and the applicant with respect the provisions of the license.

In **Moldova,** the regulatory authorities prepared draft licenses with substantial assistance from USAID consultants. These drafts were discussed by all the interested ministries and power companies.

In **Georgia,** both the draft and the final versions of licenses are generated by GNERC. During preparatory work, discussions are held with future license holders and a consulting firm.

EMI Estonia mentioned that the procedures for issuing, extending, and revoking licenses, as well as monitoring licensed operations were established by Government regulation. However, the licenses themselves were drafted by EMI.

In **Ukraine,** procedures and regulations approved by NERC requires licensed operations to also be registered with the Ukraine's Ministry of Justice. NERC periodically reviews the procedures and regulations relating to all types of licensed operations in order to modify those documents on the basis of experience and to render them consistent with the government legislation. A set of Conditions and Regulations Governing of the Business Operations in the Energy Sector of Ukraine (Conditions and Regulation) has been developed by NERC in accordance with the following laws of Ukraine: "On Private Business," "On Private Business in Ukraine," "On Electric Power," "On Natural Monopolies." NERC also received consultation assistance from USAID in generating licensing conditions.

In **Armenia**, the Commission prepared the draft license. The final version was issued after discussion with the applicants and other stakeholders. According to the "Law on Energy" in effect in the Republic of Armenia, only the Commission has the authority to issue licenses to the pre-existing businesses.

In **Bulgaria**, drafts and final versions of licenses were prepared by the Commission in compliance with the requirements of the Energy and Energy Efficiency Act and statutory documents concerning {either licensing or the licensed operations.). For each particular case, both general and specific provisions were stipulated. The conditions of the license condition were discussed with applicants' representatives and other interested parties during an open session before the licenses were issued.

Kazakhstan again is an exception since the Ministry of Energy, Industry and Commerce drafts licenses that are then approved by the government. These procedures were modified in July 2000.

In **Albania**, **Hungary, Latvia, Moldova** and **Romania,** granting of licenses to existing companies falls under the authority of the regulatory organizations of these countries.

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The number of issued licenses is summarized in the tables below

1. ELECTRICITY

	GENERATION	TRANSMISSION	DISPATCHING	DISTRIBUTION	SUPPLY	WHOLESALE
Albania	1	1	1	4	4	1
Armenia	25	3	1	4 (6)		
Bulgaria	7 + in process of licensing	1		7		
Estonia	7	1		85	85	60
Georgia	74	2	2	105		
Hungary	12	1***			3****	
Kazakhstan						
Kyrgyz	3	1				46
Latvia	32	1		11	12	
Lithuania						
Moldova	6	1	1	5	5 with restricted rates 15 with unrestricted	
Poland	71	206		206(Transmission distribution)	259 (trade)	
Romania *	11	1	1	3	10	n.a.
Russia						
Ukraine	126	47				39 with restricted rates 654 with unrestricted

2. GAS

	WHOLESALE	DISTRIBUTION	TRANSMISSION	SUPPLY	DISPATCHING
Albania					
Armenia		1	1		
Bulgaria		15	1(In addition 1 transport license, 1 gas storage license)		
Estonia	2	4	6	6	
Georgia		29	2	34	
Hungary	1			9	
Kazakhstan					
Kyrgyz	1				
Latvia	1	1	1	1	
Lithuania					
Moldova		16	1	17 with regulated rates 7 with unregulated	
Poland	43	43	43	43	
Romania *	n.a.	n.a.	n.a.	n.a.	n.a.
Russia					
Ukraine			2 by main pipelines 45 by distributive??? pipelines	43 with regulated rates 459 with unregulated tariffs	

*ANRE-Romania is not responsible for regulating the gas sector
** Ukraine listed three other operations that are licensed:
*** In Hungary the transmission company has dispatching and wholesale function as well
**** Supply and distribution together
Storage of natural gas – 2
Transportation of petroleum by main oil pipelines – 2
Transportation of petroleum products by main oil pipelines - 1

3. HEAT

	GENERATION	SUPPLY
Albania		
Armenia	3 (25)	3
Bulgaria	22	22
Estonia	15	30
Georgia		
Hungary	14	5
Kazakhstan		
Kyrgyz	5	
Latvia	89	41
Lithuania		
Moldova		
Poland	816	811
Romania *	22	22
Russia		
Ukraine		

* on 10/22/2000

The **Kyrgyz SEA** listed another type of license issued that is not included in this table. This is a license for oil processing for which one such license has been issued.

ANRE Moldova noted that 3 distribution and 3 supply licenses were withdrawn due to the privatization of 3 distribution companies. These privatized distribution companies were issued new licenses.

3. INITIATION LICENSES FOR NEW GENERATORS

Member organizations were asked if they issue licenses for initiation (construction, start-up, etc), how many different types of initiation licenses they prepare and what factors are taken into consideration when they receive an application.

ANRE Moldova, **NERC Ukraine, GNERC Georgia,** the **Kyrgyz SEA** and **ERC Latvia** do not issue initiation licenses. In **Kazakshtan**, licenses to construct different energy facilities are issued by a third organization – the Committee on Construction Affairs. In **Georgia,** this function is carried out by the Ministry of Fuel and Energy. In **Moldova,** the government must approve the construction of power stations with capacity exceeding 20 MW, of gas transmission mains and of gas reservoirs with volume exceeding 0.1 million m3.

In **Hungary,** initiation licenses are granted by HEO. HEO has drafted and issued 8 preliminary power plant initiation licenses, 11 power plant initiation licenses and 4 power plant commissioning licenses to date. When it received an application HEO reviews the a feasibility study conducted by the applicant, the environmental impact of the project, a statement on environmental feasibility, a letter of intent to buy power, financial feasibility and the availability of professional personnel.

In **Armenia**, the Commission issues licenses for construction of power and heat generating plants. The following main factors are considered in the process of reviewing an application for a license: 1. The licensed party shall have the status of a legal person and all approvals necessary under Armenian legislation., 2. Creditworthiness and availability of own resources, 3. Rational utilization of natural resources (mainly for hydropower plants), 4. Minimal environmental impact.

In **Bulgaria**, when issuing construction licenses, SERC requires compliance with both the country's energy policy and its development plans. The main analysis is made on the basis of least-cost planning and advanced technologies. There are also specific requirements regarding the technical and economical status of the applicant.

The **Kyrgyz SEA** issues construction licenses to power generation stations, substations and transmission lines.

Romanian law specifies different categories, such as an *initiation authorization* for a new capacity, a *commissioning permit* for start-up and an *operation authorization* for long term operation. ANRE Romania so far has not issued establishment initiation licenses. When issuing a license they examine the structure and the competency of the personnel and management, financial creditworthiness, and whether there is environmental authorization.

In **Poland** a so-called promise of license is issued by ERA. There have been 54 such documents issued. During the licensing procedure the financial standing of the company , its technical and environmental issues are examined by Polish regulators.

4. LICENSING EXPERTS

A natural question regarding licensing involves the expertise of regulatory organization personnel. In order to evaluate the situation in this area, we asked committee members what types of experts are employed in their agency and what type of additional expertise they feel they lack.

The answers to this question were quite similar; virtually all of the regulatory organizations employ lawyers, economists and engineers on their staffs. **ANRE Moldova** employs three engineers and a lawyer; and to improve their monitoring performance they would like to hire financial-auditing experts and well-trained regulators who are expert not only on the energy industry but also in the legal matters and economics.

ANRE Romania added that in some cases they would welcome the expertise of neutral specialists in order to get a more intensive evaluation.

In **Hungary,** outside consultants with intensive knowledge in a particular subject are used from time to time.

ERC Latvia expressed the need for economists on staff. Consulting experts are used in certain cases.

5. GENERAL COMMENTS ON LICENSING PROCEDURE

Committee members were asked what about the strengths and weaknesses of their licensing procedures. This question elicited the following comments.

NERC Ukraine replied. “NERC strictly oversees the wholesale market for electricity because of the problem of failure to pay for supplied power. Careful attention is given to supply of power at a restricted rate provided by Oblenergos, and in particular to financial transactions on the wholesale market. NERC has issued punitive sanctions (fines, license suspension, and provisional license cancellation) to Oblenergos for violating NERC decisions and applicable laws. These sanctions were not very effective because of lack of procedures to implement them. For example, fines were contested in Arbitration Court, and cancellation of license was not possible because of lack of an alternative power supply service in the area.

“A new Law, “On Changes in the State Law On Electric Energy,” has given NERC additional authority, particularly in the area of punitive sanctions for violation of license conditions regarding trade on the wholesale market. A new sanction has been introduced. Now NERC may appoint a temporary manager for a power supply company that does not pay on the wholesale market and violates consumer rights. However, the specific procedures of this

sanction have not been developed yet. Thus, we expect to increase the efficiency of NERC's role in the area of license holder control.

"Thus, NERC would like to receive information from fellow commissioners who have had experience in appointing provisional managers for power supply company. We are sure that such information would be useful to others besides our Commission."

GNERC Georgia names the following licensing procedures as being efficient: economic analysis, open public discussions of conditions and stipulation of licenses. They think that license revocation is not as efficient as it is impossible in the case of natural monopolies

ANRE Romania added that there are non-discriminatory and transparent (clear) rules for granting licenses to current and new participants in the Romanian electricity and heat market. Each license is issued in a public meeting. On the other hand, the primary legislation specifies the rather low maximum of 250 kW for authorizing energy capacity. The Romanian committee member considers this to be too low.

With regard to Hungarian practice, the **HEO** thinks that stricter conditions should be set for mergers and buy-outs of companies. A possible solution could be a more accurate amendment of the existing law.

SERC Bulgaria emphasized that licensing procedures were developed to provide sufficient public awareness and to assure the applicant of objectivity during the decision making process. However, considering the short period available for analyzing a large number of applications, some of the economic and technical aspects can only be clarified after the licenses are issued.

ANRE Moldova is satisfied with their thorough procedure of the examining submitted documents. However, problems may occur because the statutory basis for the licensing procedures has not been completed yet and because certain statutes of the "Law on Licensing" and the "Law on Electricity and Gas" contradict each other.

EMI Estonia noted that, to comply with the Energy Act, they cannot refuse to issue licenses to new (inexperienced entrepreneurs. This causes the Inspectorate problems in the case of fuel enterprises.

ERC Latvia commented that "issuing licenses and the information gathering analysis process used to be easier."

Armenia noted that: "The applicant must spend considerable time to obtain all approvals necessary under Armenian law and based on the maximal amount of time needed by all corresponding institutions to issue licenses."

6. MONITORING

We were interested in whether the statutory power granted the regulator and/or the licensing provisions enabled the monitoring activities of the regulatory organization. We also asked the committee members whether they had a structured, planned monitoring system in place that allows them to follow up on the activities of the license holders. As one can see from the

answers, monitoring is quite well developed in many regulatory bodies and many of them have a well-structured system.

In Hungary the statutory power has definitely enabled **HEO**'s monitoring activities. The Office has a structured monitoring system to evaluate compliance with license conditions and with different regulations, financial stability, efficiency and improvements.

ANRE Romania is entitled to carry out monitoring of licensees. Each license contains a special provision that requires the license holder to report its technical and financial performance to ANRE annually. There is also a special unit responsible for the monitoring and audit of licensees. ANRE will establish a database for the electricity and heat sector that will make it possible to compare the cost, quality of service etc. of similar businesses.

The "Law On Electric Energy" delegates the right to monitor to **NERC Ukraine.** The Department of License Control and Local Representation performs this monitoring. This department is responsible for resolving conflicts related to non-compliance with regulations and also coordinates the activities of the regional offices.

Statutory power has a positive influence on **GNERC Georgia's** monitoring activities. A structured system of monitoring is being established now and should be implemented in the near future. The commissioners of Georgia would support the Licensing/Competition Committee's development of recommendations for the system for monitoring licensed companies.

ANRE Moldova described their monitoring activities in detail. Monitoring activities are divided between three different departments. The Licensing Department is responsible for monitoring production and the necessary technical/economic indices. The Rate and Economic Analysis Department is responsible for monitoring the financial and economic activities of the license holders. The Customers' Rights Protection Department checks on whether customers' complaints are answered and also monitors the quality of supply. There is no separate monitoring department within ANRE.

However, ANRE Moldova, stated that they are not performing monitoring in the requisite manner. This is partially due to a lack of sufficient experts and expertise to the fact that the department is heavily occupied with the development and implementation of basic standard and regulatory documents. ANRE trusts that monitoring activities will be improved and strengthened since it is an important component of the regulation process.

ANRE performs other forms of monitoring using information from the Statistics Office and from other government agencies such as the Ministry of Justice, Ministry of Foreign Affairs, Customs Office, Privatization Agency etc.

ANRE suggested the following proposal regarding monitoring: if it is to achieve high quality operational monitoring, a regulatory organization must have a clear understanding of the spectrum of monitoring indices, the list of necessary documents, what should be required of the personnel in charge of monitoring, and of the optimal conditions for on-site checks.

Pursuant to the **Armenian** "Law on Energy," monitoring of licensed activities is the responsibility of the Commission. The revisions of this Law and the licensing conditions had a

positive effect on monitoring performance. Realizing the importance of monitoring licensed operations, on September 1, 2000 the Commission created a Monitoring Department.

In **Latvia,** monitoring is performing by requiring companies to submit annual report to ERC. In addition to ERC, the Competition Council, the Environmental Protection Inspection, the State Income Board have monitoring functions.

In **Estonia,** EMI has a Market Supervision and Technical Department. A plan-based monitoring system is currently being developed.

In **Bulgaria,** SERC is planning to establish a Monitoring Section that will monitor compliance with license conditions.

In **Lithuania,** in the future the Commission will be authorized to monitor the license holders regarding compliance with the license conditions. The Commission has the right to demand all information necessary to perform its duties.

In the **Kyrgyz Republic**, the Gosenergo Inspection of Electricity and Gas operating under SEA is responsible for monitoring, but they lack a structured monitoring system.

In **Albania,** ERE has statutory power to perform monitoring but as they state, "electricity is a natural monopoly and for this reason we have many economic problems."

In **Poland ERA** has a Control and Analysis Department responsible for monitoring licensed activities. However, because of the high number of the license holders, it is very difficult to effectively monitor the power sector.

7. RIGHTS AND PRACTICES IN AMENDING EXISTING LICENSES

The next question focused on amending energy licenses. We asked program participants whether their organizations have the statutory power to amend licenses and whether they have actually had such cases. The situation again seems to be rather homogeneous, practically all the regulatory organizations are empowered to amend licenses. However, we received a slightly different answer from **Hungary** where only the license holder can initiate the amendment of the license. In the case of non-compliance with the law, HEO is entitled to withdraw the license. At the same time, HEO would welcome being authorized to amend a license.

Amendment of the Conditions and Regulations can be initiated either by the license holder or by **NERC Ukraine** if the Ukrainian laws in effect have been amended or there is a resolution of the Ukrainian Antimonopoly Commission or of the court. Amendments suggested by the licensee must be well justified and submitted in written format. They will then be discussed jointly by the NERC and the licensee.

ANRE Romania is empowered by law to amend the provisions of licenses in certain situations, such as changes in the regulatory framework, new developments in the structure of the market, etc. This already has occurred (new businesses appearing after CONEL's last restructuring). All licenses issued contain a provision stating that during the first year their conditions are subject to change, through negotiations with the licensee.

A Law in **Moldova** provides for the amendment of licenses both on the initiative of the regulator and of the license holder, with the consent of both parties. During the first year of the enactment of this law it authorized the regulator to amend the license without the consent of the license holder with the objective of protecting consumers' rights. The regulators have exercised this right.

According to the **Armenian** Law on Energy, the Commission has a right to amend licensing conditions with the consent of the licensee. However, to date no such amendments have been made. Licensing conditions can be also amended at the request of a licensee with the agreement of the Commission.

EMI Estonia is also entitled to amend licenses and they have often done so.

SERC Bulgaria is authorized to amend licenses, but they have not yet done so.

ERC Latvia has the right to amend licensing conditions and have done so.

GNERC Georgia also frequently exercises its right to amend existing licenses.

ERA Poland is entitled to amend the licenses. The number of amendment decisions reached 2281.

8. MARKET POWER ISSUES

We asked if the market share is controlled exclusively by the regulatory organization or conjointly with other agencies such as the Antimonopoly Committee, the Competition Office or any other. We also asked if there is a legal justification provided for Market share. Finally, we asked committee members whether they had ever experienced problems in this area. In answering these questions, all the participants tried to describe the market situation and conditions in their country which provides us a with very complex picture.

In **Hungary,** market share is controlled jointly with the Economic Competition Office (ECO) with regard to share acquisition rules. In compliance with the current Electricity Law, HEO requests a so-called competition policy opinion from ECO if shares of licensed companies exceed 25 or 50%. The new law (to be amended in 2001) will have provisions regarding capital concentration as well (based on the draft). [Capital concentration a) of an outsider in a licensed company, b) of a licensed company in another licensed, c) outsider or licensed indirectly.] A legal explanation justification for market share is provided in the Hungarian Competition Law.

In **Romania,** ANRE is authorized to survey the market and propose measures to the government in order to prevent the abuse of dominant market position. There are certain provisions in some licenses preventing the licensee from performing activities which could contribute to the establishment of a monopoly company. These measures shall be performed in collaboration with other authorities involved in market control, such as the Council of Competition (an autonomous body responsible for regulation s of competition) and the Office of Competition (a government agency authorized to carry out investigations to prevent monopoly practices).

According to the current law, **NERC Ukraine** controls only the wholesale electricity market of electric power supply. The "Energorynok" state enterprise provides the day-to-day performance parameters of the Unified Energy System of Ukraine with respect to: price bids from heat power stations, volume of power produced, volume of power supplied, amount to be paid to the generators, amount to be paid by the suppliers, price of electricity on the wholesale power market. To prevent a price increase for electricity under these limited competition conditions, NERC regulates the rate for electricity from heat power stations by limiting both the price bid and the fixed cost element. NERC has created an efficient control system and a regulated economic environment for the Unified Energy system of Ukraine under conditions of a multi-party agreement negotiated with wholesale market operators. This agreement coordinates the legal, economic and administrative aspects of activities on the wholesale market.

In **Moldova,** the natural gas market was deregulated in 1999, meaning that every consumer has the right to choose his supplier and every supplier has free access to any transport or distribution lines. On the other hand, in the electricity market every producer or supplier can sell only to the distribution company. This is connected with the fact that in Moldova the local energy generation sources do not own more than 30% of electric power. This market is expected to be deregulated only after 2001. In Moldova the term market control is not employed, rather the term market regulation is used. There are no other organizations authorized to perform market control.

Market control is the authorized responsibility of **GNERC Georgia**. The function of the commission is to approve market regulations and to supervise the activities of the energy market within the framework of its delegated authority.

In **Bulgaria**, in addition SERC there are two other organizations responsible for market power issues. The State Agency of Energy and Energy Resources is responsible for general policy in the field of energy and energy resources. SERC issues licenses for energy-related activities and the State Agency of Energy Efficiency is responsible for energy efficiency related issues.

In **Estonia**, EMI works very closely with the Estonian Competition Board in market share issues.

Armenia answered, "There is no competitive market at the present time. The single buyer model is in place."

ERC Latvia described the situation in their country as follows: "an electricity market does not yet exist yet." The **Kyrgyz SEA** gave exactly the same answer.

In **Lithuania** if one producer owns more than 25% of the market, the Commission must establish rules regarding price regulation of that producer.

The answer received from **Albania** is that **ERE** does not control the market share at all.

In **Poland** there is an Antimonopoly Office in place responsible for regulating market power issues. ERA is responsible only for licensing and tariff related issues.

9. ADDITIONAL ISSUES RELATED TO LICENSING/MONITORING

Finally, we asked program participants to express their general thoughts and ideas regarding licensing and monitoring.

Commenting on this topic, **NERC Ukraine** described a very special situation. According to them, the operational problems of the Unified Energy Market are rooted in the fact that many of its fundamental principles have never been implemented. There is an inefficient market because of non-payment by consumers and non-performance of financial contractual obligations on electricity purchases by energy suppliers. This has resulted in the power generators being unable to purchase fuel and this in turn resulted in insufficient competition and rate increase instead of the reduction expected. These problems are the result of the state administrative and executive bodies' involvement in the financial transactions of market operators; the lack of a self-regulatory mechanism (i.e. arbitration court and audit); the absence of penalties and other sanctions for non-compliance with contractual agreements; and, ignorance of reasonable proposals for changes in the market regulations.

The inequitable energy market in Ukraine demands state involvement, which could help eliminate the above problems. However, it must be stated that NERC's role and its level of authority are very unpopular and there have been many attempts to reduce its power. NERC is witnessing attempts to eliminate the economic mechanism (law of supply and demand) from the energy market's operation. The Ministry of Finance, particularly, wants to terminate NERC's funding the only items included in the budget are salaries. Thus, it is clear that there has been a direct attempt to eliminate NERC as a regulator and to transfer its functions to administrative methods.

Thus, at this point the main problem is trying to maintain the independent status of NERC. A proposed solution could be consideration of international experience in the field of regulation of natural monopolies in terms of maintaining distance from private interests between the regulator on one side, and the consumer and the state on the other, in order to avoid political pressure on NERC's decisions. Another solution could be to provide NERC with an autonomous organizational mechanism with a sufficient and stable source of funding from license fees paid by license holders – and thus ensuring efficient licensing control, rate policy, and protection of the rights of license holders and consumers.

ANRE Romania commented as follows:

"In our opinion the process of granting licenses and authorizations provides the regulator with an intensive knowledge of the regulated economic agents of the sector, in both its technical and economical aspects.

"License conditions impose very clear provisions on the licensee. The most important of these are: quality of service (performance standards), establishment and compliance with financial guarantees, separation of financial- accounting records, provision of a normal competitive environment and equal treatment for other market participants and consumers, elimination of cross subsidies, informing the appropriate authority about share transactions or sale of assets. Consistent supervision and control are critical.

ERC Latvia put the question, "How can the regulator influence licensing conditions if the energy supply companies simply ignore them?"

ERE Albania would like to obtain information pertaining to their unique situation where the regulatory body is authorized by statutory power but at the same time is unable to perform its regulatory duties because the power sector is organized as a vertically integrated, 100% state-owned natural monopoly.

SERC Bulgaria wanted to emphasize that their agency is only 1 year old and currently their main focus is on licensing the energy companies that were active on the market prior to the Energy and Energy Efficiency Act. So far, 130 applications have been submitted to SERC and only about half of them have been answered.

ANRE Moldova asked the following questions regarding this topic:

- Is it necessary to designate the geographic area for a licensee and in what form (including expansion of the net to neighboring territories)?

- Can other licensees compete in the geographic area assigned to a specific license holder with similar operations since that may provide better service to the customers and higher customer satisfaction (as the designated licensee is a monopolist on the designated territory)?

- Is the license holder on a designated territory compelled to develop its net and under what conditions?

ENERGY REGULATORY AUTHORITIES IN CEE/EURASIA

Abbreviation	Country	Energy Regulatory Agency
	Kazakhstan	Agency of the Republic of Kazakhstan for Natural Monopoly Regulation, Competition Protection and Small Business Support
ANRE	Moldova	National Energy Regulatory Agency
ANRE	Romania	National Electricity and Heat Regulatory Authority
ECRA	Armenia	Energy Commission of the Republic of Armenia
EMI	Estonia	Energy Market Inspectorate
ERA	Latvia	Energy Regulation Council
ERA	Poland	Energy Regulatory Authority
ERE	Albania	Electricity Regulatory Authority
FEC	Russian Federation	Federal Energy Commission of the Russian Federation
GNERC	Georgia	Georgian National Energy Regulatory Commission
HEO	Hungary	Hungarian Energy Office
NCC	Lithuania	National Control Commission for Prices and Energy
NERC	Ukraine	National Electricity Regulatory Commission
SEA	Kyrgyz Republic	State Energy Agency under the Government of the Kyrgyz Republic
SERC	Bulgaria	State Energy Regulatory Commission

List of documents necessary for obtaining a license in the Kyrgyz Republic

To obtain a license an applicant shall submit the following documents to SEA:

- An application in the accepted format;
- A copy of a Certificate of State Registration;
- Copies of the Charter;
- Documents confirming payment of the licensing fee;
- A summary describing the abilities and the level of qualification of the applicant;
- Complete information about financial and technical capabilities, information about the presence of qualified experts who will provide quality and safe services as a part of the licensed activities, as well as financial status report, including a list of funding sources, and others;
- A list of standards and technical documentation based on which the licensed activities will be conducted;
- A precise description of the area where the licensed activities will be conducted;
- An impact statement issued by the State Sanitary Inspection and Environmental Control Agency (if necessary);
- A note from the Social Fund confirming the act of registration and allocation of resources to the Fund.

When necessary, SEA may request additional information:

- Confirmation of registration from the Tax Agency;
- Calculation of cost of a KW/h of power sold or transmitted (if obtaining a license to sell or transmit power).

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Export Import Working Group

Electricity Trade and the Role of the Regulator

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ELECTRICITY TRADE AND THE ROLE OF THE REGULATOR

EXECUTIVE SUMMARY

The development of competitive electricity markets in regions with two or more countries, or two or more Transmission System Operators (TSOs), is a recent phenomenon. Power sector restructuring within a single state, province, or country has led to competitive markets that are now spilling over the boundaries of states, provinces, and countries. This is a global trend that has important implications for Central Europe and Eurasia.

Regulators in Central Europe and Eurasia can participate in the creation of regional associations of Transmission System Operators (TSOs) and countries, so that these TSOs and countries will be able to harmonize the legal and regulatory framework for electricity trade. This report provides general guidelines concerning the topics to be discussed and the role of Regulators, government representatives, and TSOs. The purpose of this report is to (1) define the role of the regulator to facilitate regional electricity trade; (2) help create conditions in each country that are essential for expanded trade; and (3) support national level electricity market reforms and the creation of competitive regional electricity markets.

Why electricity Trade?

The movement toward expanded regional electricity trade is emerging as countries reform their power sectors. Why are electricity exports and imports important? First, generation costs savings can be achieved which should be reflected in lower consumer prices. Second, macroeconomic benefits result through lower prices and economic development. Third, power sector reform is enhanced as the benefits can be greater in a regional competitive electricity market than in a single country. Fourth, future participation in the European Union (EU) electricity market is an incentive to reform and common practices.

Current Conditions

At the present time policies and rules on export, import and transit are generally not well established and transparent; the roles of the key organizations (Ministry, Regulator, Transmission Company, Generation and Distribution Companies) are inadequately or inappropriately defined; and legal and regulatory frameworks are inadequate. In some countries, non-payment problems can be a serious obstacle to trade. Other impediments to trade can include (1) a "Single Buyer" transmission company arrangement that brings out monopoly behavior and restrictions on trade that harm consumers; (2) long-term power purchase agreements with domestic producers that can impede competitive exports, imports and transit, and; (3) import restrictions to protect jobs in higher cost power generation and coal facilities. Despite these problems and the decline in electricity demand and trade in the early 1990s, there is a growing recognition of the benefits of regional trade and cooperation in the Baltics, Central Europe, Southeast Europe, Central Asia and elsewhere.

Measures Needed to Support Export, Import and Transit

Successful regional electricity trade development will depend upon the extent that each country implements national power sector reforms. At the national level it is important to have a strategy including the legislative and regulatory frameworks to support competitive national and regional

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markets. This should cover international interconnections, harmonized transmission tariffs, network access and market rules among several countries. Such market rules may include transit agreements, bilateral contracts to buy and sell electricity among a buyer and seller in different countries, and some kind of spot market. Tariff issues to be addressed include network service tariffs, transmission and ancillary service costs.

To support a competitive electricity market, a Transmission System Operator (TSO) should be independent in management terms from generating and distribution companies, large customers and the government. A separate legal entity with broad governance is the simplest and most transparent approach to independence.

On a regional basis, it is necessary to have coordination among: (1) national policies; (2) transmission system operators; and (3) energy regulators. This can lead to cooperation and rules on protection of grid stability, access rights to networks and network service tariffs.

Role of the Energy Regulator and Others in Electricity Imports, Exports and Transit

It is important to define the respective responsibilities of the energy regulator, government representative (Ministry) and Transmission System Operator (TSO). Most energy regulators in Central Europe and Eurasia today lack the explicit legal authority to play a regulatory role on the regional level. Because their budgets and resources are small, some regulators may allow Ministries and TSOs to take the lead in international activity. However, foreign investors, international financial institutions, and the international community generally perceive a strong regulator as an essential part of the development of competitive electricity markets. In addition to its normal functions of licensing, tariffs and monitoring, the energy regulator can advise the Government on national and regional electricity market policy and laws and support development and approval of grid code and market rules.

Rules for regional electricity trade must cover three major components: (1) protection of grid stability;
(2) access rights to networks and methods of managing congestion as well as responsibility for planning and investments in new interconnections; and (3) network service tariffs, including payments among TSOs and by transmission network users to their TSOs.

The “Government Representative” (usually a ministry) plays a key role in electricity market policy and legislative development that should move toward commercial trade away from government-to-government arrangements. Design of the reformed power sector should consider the historical government control of transmission and dispatch operations for political purposes. The ministry has regional level responsibilities including the interpretation and enforcement of international agreements signed by the country and to participate in negotiations with other countries to establish regional electricity markets.

A Transmission System Operator should play a role in developing rules for regional electricity trade including those dealing with grid stability, access rights, connection and interconnection and payment arrangements.

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Electricity Trade and the Role of the Regulator

Chapter 1. Background

1.1 Regional Energy Regulatory Program

With the assistance of the U.S. Agency for International Development (USAID), the National Association of Regulatory Utility Commissioners (NARUC) coordinates an information exchange program among the new energy regulatory bodies in Central and Eastern Europe and Eurasia. The core of the program is the work done by two committees: the Licensing/Competition Committee and the Tariff/Pricing Committee.

At the 3rd Annual Energy Regulatory Conference in Budapest, Hungary on 7-9 December 1999, the Licensing/Competition Committee decided to form an Export Import Working Group chaired by Maria Manecuta, Director of the Licenses and Technical Regulations Department of the Romanian National Energy Regulatory Authority (ANRE). The Working Group included regulators from the Tariff Committee as well.

The Export Import Working Group was created to address issues concerning import, export, and transit among groups of countries. The member countries of the Working Group cover a large area stretching from Hungary, in the west, to Kazakhstan, in the east. This area is subject to new developments in exports, import and transit as a result of political and economic changes such as the development of competitive regional markets.

The Export Import Working Group held its first meeting in Riga, Latvia on 17-18 June 2000 and developed an outline of this report. The purpose of this report is:

1. To define the role of the regulator to facilitate regional electricity trade
2. To facilitate the creation of conditions in each country that are essential for expanded trade
3. To support electricity market reforms at the national level
4. To support the creation of competitive regional electricity markets.

The creation of a competitive electricity market requires the formation of generating companies, distribution companies, and an independent transmission company as well as the opening of the market to large electricity consumers at the national level. If the market is properly designed, competition among generating companies and importers should result in lower annual average prices to consumers, compared with price levels in a market controlled by a vertically integrated monopoly and restrictions on exports and imports. In larger countries competition is possible at the national level, although in some of the smaller countries competition among generators and importers is possible only at the regional level. In either case market reforms must begin at the national level before the benefits of electricity trade can be fully realized.

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International electricity trade began to develop in the 1950s and reached a high level of technical development in the 1980s. However, the development of competitive electricity markets in regions with two or more countries, or two or more Transmission System Operators (TSOs), is a recent phenomenon. Restructuring of the power sector within a single state, province, or country has led to the creation of competitive markets that are now spilling over the boundaries of states, provinces, and countries. This is a global trend which has important implications for Central Europe and Eurasia.

Perhaps the next step to be taken by Regulators in Central Europe and Eurasia is to participate in the creation of regional associations of TSOs and countries, so that these TSOs and countries will be able to harmonize the legal and regulatory framework for electricity trade. This report provides general guidelines concerning the topics to be discussed and the role of Regulators, Government representatives, and TSOs in the harmonization process.

1.2 Why are electricity exports and imports important?

There are four reasons why regulators should support the development of a legal and regulatory framework for import, export, and transit among a group of countries:

1. *Generation cost savings*. Over the whole region composed of a group of countries, the development of electricity trade enables each country to meet hourly electric load and customers' annual requirements using a least-cost mix of generating sources. Because generating resources are varied, including hydroelectric resources, electricity trade usually enables power systems to lower their generation costs over any 12-month period. The cost savings should be reflected in lower prices to the consumer or greater capital expenditure on measures needed to reduce losses, reduce theft, and improve system reliability. In either case the customer should receive a benefit. Because the cost of electricity from a new generating unit is related to its location, a regional market allows generators to choose from a wider variety of sites to find the one that is expected to minimize generation and transmission costs. The potential for generation cost savings is particularly important for smaller countries and for countries that are heavily dependent on a single fuel or type of power generation.

2. *Macroeconomic benefits*. Lower electricity costs enable suppliers to provide electricity at lower prices to the customer. When electricity trade results in lower prices, the economic development of the region is promoted. The countries that have a comparative advantage in electricity generation – for example, countries with surplus hydroelectric power or high-quality coal reserves – will export electricity to countries that have a comparative advantage in other types of economic activity. International trade is normally beneficial to economic development when import and export prices are not artificially manipulated by governments.

3. *Power sector reform*. It is easier to create a competitive electricity market in a group of interconnected countries than in a single country, unless it is a large country with a highly interconnected grid. The larger the number of generating stations and producers connected to the grid, the greater the chances that the consumer will benefit from a

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competitive electricity market. This consideration is particularly important for countries in which generating resources are controlled by a company with monopoly power. Power sector reform in small countries is more effective when a regional market is established for an unbundled power sector, because regional markets facilitate competition.

4. *Participation in the internal market of the EU*. For the EU accession countries, interconnection with UCTE and Nordel will accelerate the process of power sector reform by subjecting transmission system operators to rules for trade with EU countries and by introducing the principle of reciprocity. The accession countries, under the principle of reciprocity, may not export electricity to the EU unless they open their markets to producers from the EU.[1]

There are two possible conditions of electricity trade among interconnected power systems:

1. *Import, export, and transit among a group of countries*. This kind of trading arrangement will enable the countries to maximize the benefits from electricity trade. In this situation it is possible for a country to import electricity from a country that is not a neighboring country. When a large geographic area is involved, the number of possible import and export transactions is very large; this is the most favorable condition for a competitive electricity market to develop. To facilitate energy flows over a large number of possible physical paths it is necessary to have one large synchronous interconnected system. A small number of physical paths can be implemented by asynchronous interconnections. To create a single market for electricity in a large geographic area, normally both synchronous and asynchronous interconnections are needed.

2. *Export-import trade between neighboring countries*. This kind of trading arrangement will permit the countries to obtain only limited benefits from electricity trade. These transactions can be implemented with either AC or DC interconnections. Asynchronous (DC) interconnections are used where it would be very difficult to achieve a high degree of coordination or to implement uniform standards for network construction and operation. When a country imports electricity from its neighbor, in some cases the electronic energy flows over a short physical path (for example, 100 km). Perhaps the simplest example of import-export trade between neighbor countries is the connection of a small "island" to a large neighbor country.[2]

In special situations it is possible to have synchronous interconnection with no export-import trade. The interconnections among high-voltage networks of neighboring power systems make it easier to stabilize frequency and voltage and reduce the cost of instantaneous reserves and spinning reserves for the power systems that are joined together. It is technically possible to

[1] See Appendix C for information on the EU accession status of Central European countries.

[2] For example, Uralsk and Aktyubinsk are located in Kazakhstan but connected to the Russian power system because they are far from the main interconnected power network of Kazakhstan. In 1999 the unified power system of Russia operated in an island mode with the power systems of Kazakhstan, Finland, Norway, China, and Mongolia. http://www.cdo.org

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achieve these benefits without import, export or transit. Synchronous interconnection requires a high degree of coordination and cooperation among dispatch centers, and requires the acceptance of uniform standards for construction and operation of high-voltage networks to ensure system reliability.[3]

Chapter 2. Current Conditions

2.1 Current condition of energy regulators in Central Europe and Eurasia

In Central Europe and Eurasia (CE&E) there is a general trend toward restructuring of electricity markets to promote competition among generators and suppliers, and a trend toward privatization of generation and distribution companies. Both of these trends establish power sector structures in which there is a need for an independent regulatory authority. In general the countries that have made the most progress toward restructuring and/or privatization are the countries that have made the most progress in establishing politically independent regulatory agencies. The independence of the regulator, the ability of the regulator to initiate tariff hearings and set tariffs, and the ability of the regulator to issue licenses and enforce license conditions vary from country to country. The legal framework for government supervision and regulation of electricity export, import, and transit also varies from country to country.

One of the purposes of this Issue Paper is to define the role of the regulator to facilitate regional trade. Under current conditions this role is undefined because:

- Generally, policies and rules on export, import and transit are not well-established and not transparent
- The roles of the key organizations (Ministry, Regulator, Transmission Company, Generation and Distribution Companies) are inadequately defined.
- Legal and regulatory frameworks are inadequate.
- Non-payment problems can be a serious obstacle to trade. In some regions the importers have accumulated large debts to the exporters. If an entity would like to import electricity but cannot pay for it, electricity trade may be impossible.
- Policies concerning confidentiality of information and documents are not clear.
- Situations in each country vary with regard to the regulator's authority to license exporters and importers, and the regulator's authority to approve or regulate transit fees.

[3] For example see UCPTE, *Summary of the current operating principles of the UCPTE*, October 1998. This document is available from http://www.ucte.org/Publikationen/English/Default_Pub_E.htm and is listed among Publications as "UCTE-Principles of Network Operation."

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- Power sector reforms needed to facilitate optimal imports and export are not complete. For example, the regulator may have authority to license new (restructured) companies, approve Market Rules, and approve a Grid Code but the regulator may be waiting for other players to implement the necessary reforms.

- Situations vary with regard to excise taxes on electricity exports and imports. Some countries have VAT on electricity sales to final customers and therefore VAT on imports.

When a regulatory agency is created, elected officials agree that a regulator is needed to protect domestic consumers. In most countries, however, there is a political coalition in favor of privatization, and that coalition tries to establish a regulatory framework that will make the to-be privatized companies attractive to investors. For example, privatization may require an increase in electricity tariffs, a tough policy toward debtors, and other politically unpopular measures. The regulator in this situation must balance the interest of investors against the interests of consumers.

In trying to resolve the conflicting interests of investors, consumers, and energy sector workers the Parliament, President, and Cabinet of Ministers may be unable to establish a clear policy on government supervision and regulation of electricity export, import and transit. Although consumers will benefit from any trading arrangements that reduce costs and improve efficiency of the power sector, consumers typically do not understand export-import issues and would prefer to leave these questions to specialists. Investors will have competing interests – some will favor competition among generators, other will favor long-term power purchase agreements, and it will not be easy for the regulator to decide which policy will attract more foreign investment.

Because export-import issues touch on questions of "state policy" it is necessary for Ministries to play an important role in export-import issues. If a country becomes dependent on imported electricity, for example, and loses the ability to meet electricity demand from domestic generating stations, there is either a real or perceived threat to national security. If a lot of money or a lot of jobs are involved in electricity import, export, and transit there is a tendency for political authorities to look at electricity trade as a foreign policy issue affecting relations with neighbor countries. All of these considerations lead to involvement of a Ministry or perhaps the entire Cabinet of Ministers.

In the absence of a clear policy on government supervision and regulation of export, import and transit, the power sector may end up in one of the following situations:

- *Deregulation*. Export, import and transit become unregulated activities conducted by transmission system operators and other companies in the power sector. In this situation the management of a company will try to figure out what is in the company's best interest, and then negotiate agreements with entities in neighbor countries.[4]

[4] The dispatch center DC Baltija is an example of partial deregulation. It was formed as a joint stock company owned by three vertically integrated power systems, who sign contracts with each other. The supervisory board,

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- *Ministry control*. The Ministry that is considered the "owner" of the power sector controls export, import, and transit. International agreements are prepared by energy specialists in the Ministry and signed by the Minister in charge (or perhaps the President of the country).

From the regulator's standpoint, neither situation is satisfactory. If domestic trade is regulated, then why should international trade be without a regulatory framework? If trading results do not favor the consumer - for example, if export revenues are lower than forecast and imported electricity costs are higher than forecast – should the regulator immediately and automatically raise electricity tariffs to the consumer? If domestic generating stations are licensed, then why should importers be unlicensed?

2.2 Trade restrictions

From the consumer's standpoint, the best trade policy is usually the least restrictive trade policy. Consumers benefit from international competition among producers and from having a market with access to a large network with many possible physical paths available to implement buy-sell transactions, and with a substantial flow of information. However, some countries have adopted policies that inhibit electricity trade:

- Some countries have selected a power sector structure in which the transmission company has a monopoly over all purchases from producers and all sales to distribution companies. This is sometimes called a "Single Buyer" system although that phrase is used in the EU Electricity Directive to describe a different kind of legal framework.[5] In Central Europe and Eurasia, Single Buyer arrangements tend to bring out monopoly behavior and restrictions on electricity trade that are against the interests of final consumers.

- Some countries do not support the flow of information to consumers concerning generation costs, import and export prices, or electricity tariffs in neighboring countries, and even restrict the flow of information about competitive alternatives that could pose a threat to a company under state ownership.

- Existing long-term power purchase agreements (PPAs) with domestic producers are an impediment to expanded competitive export, import, and transit. These PPAs are also an impediment to spot market development and where generation is privately owned, potential losses may create serious legal problems and costly settlements.

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which holds quarterly meetings, includes representatives of the three Ministries of Economy as well as the three power companies. Energy regulators do not license DC Baltija.

[5] Under the Electricity Directive one of the possible forms of market opening in an EU member country is a Single Buyer system in which the Single Buyer purchases energy from producers and suppliers and resells electric energy to qualified customers and distribution companies but buyers and sellers in the wholesale market nevertheless have the right to negotiate contracts with each other. This is not a form of monopolistic control but an alternative way to achieve the same economic results that regulated third party access or negotiated third party access would achieve.

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- Some countries restrict imports to protect the jobs of workers in the power sector and/or the coal mining sector. These restrictions are inhibiting electricity trade.

- Some national policies and practices, such as the disconnection of a national power system from the power system of another country, impede transit of electricity.

One of the complex questions for Central European countries is the opening of their electricity markets to competition with the member countries of the European Union. Because the EU countries have the financial resources needed to construct modern, efficient, power stations meeting strict environmental requirements, Central European generating companies will eventually have difficulty paying for fuel at world prices and selling electricity at competitive market prices. Consumers will benefit from international competition among producers, but the financial weaker generating companies and coal producers will be threatened by competition. As long as Central Europe has a surplus of generating capacity, the generating companies can keep their production costs below long-run marginal cost. Eventually the capacity surplus will be used up and it will be necessary to build new power stations or import electricity. The new power stations, and the stations that have been rebuilt according to strict environmental standards, might have difficulty competing in the internal EU market.

In Central Europe and Eurasia, competition may also come from other countries in the region (for example Russia and Ukraine). To the extent that thermal power export prices are based on artificially low fuel costs, or nuclear power export prices exclude the true cost of waste disposal, fuel storage, and decommissioning, there is a valid basis for domestic generating companies to ask for protection from competition with imported power. On the other hand, opening the market to competition may demonstrate that countries such as Russia and Ukraine have a true comparative advantage in electricity generation.[6] It is necessary to ensure that electricity trade is founded on long-term agreements among Government representatives, Regulators, and TSOs for the mutual benefit of all of the countries involved. Long-term power purchase agreements between buyers and sellers are usually necessary to support investments in power generation, but Government representatives and Regulators should not allow these agreements to create serious trade restrictions.

In some countries of Central Europe and Eurasia the transmission system has a surplus of transmission capacity, relative to the amount of capacity needed to serve domestic customers.[7] A country in this situation will benefit from electricity trading arrangements that increase the utilization of that country's transmission network. When electricity trade restrictions are

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[6] If country X has high prices for generation and country Y has low prices for generation, restrictions on electricity trade will hurt consumers in X and help consumers in Y but the economic development of the whole region will suffer. For example, if Russia generates electricity that is truly low-cost and is sold to Russian consumers at very low prices, electricity exports would bring benefits the Russian economy but higher prices to Russian consumers. To promote economic development, the best policy is to allow trade.

[7] The reasons for low utilization of transmission interconnections in CEE and Eurasia are: (1) a 30 to 50 percent drop in electricity consumption relative to 1990, (2) asynchronous operation of high-voltage networks where frequency is unstable; (3) inability of the importing country to pay for electricity imports, and non-payment for imported fuel and energy; and (4) trade restrictions related to national independence and national security concerns.

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removed and as a result transmission system services needed to support international trade are added to transmission system services needed to meet domestic electricity demand, the TSO may be able to propose tariffs that reduce the amount of the fixed costs of the transmission network that must be recovered from tariffs to domestic customers.

If transit and export require new investment in a country's internal transmission network, as well as investment in interconnections, transmission tariffs to all customers might need to be increased.[8] Although the cost of new investment in interconnections might be recovered from special tariffs for the use of these interconnections, other categories of transmission system investment will affect domestic transmission tariffs and therefore the benefits associated with removal of trade restrictions will be reflected in competition among generators rather than in transmission tariff reductions.

2.3 Emergence of regional electricity trade

In Central Europe and Eurasia there was a sharp drop in electricity demand in 1990-92 which led to a general reduction of regional trade in electricity. Electricity importing countries typically responded to the fall in electricity demand by reducing the level of imports, not by reducing the level of domestic power generation. Because the level of trade declined, and because some countries (or regions within countries) had difficulty maintaining frequency and voltage within reasonable limits, the pattern of interconnections among power systems of Central Europe and Eurasia began to change. Toward the end of the 1990s the benefits of regional trade were recognized and a revival of regional electricity trade began to develop.

At present there are six groups of countries in Central Europe and Eurasia in which electricity export, import and transit agreements are being developed:

- Poland, Hungary, Czech Republic, Slovak Republic (the countries that have already formed an association called Centrel)
- Estonia, Latvia, Lithuania (the countries that have agreed to form a Common Baltic Electricity Market)
- Romania, Bulgaria, FYR Macedonia, Greece, Albania, and Bosnia-Herzegovina (the countries that signed the Thessaloniki Agreement on 10 September 99 calling for a regional electricity market by 2006)[9]

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[8] When generation, distribution, or transmission assets are fully utilized and demand is growing, there is nothing wrong with tariff increases based on true economic costs. It is better for customers to have higher tariffs and reliable electric service than face electricity shortages.

[9] Five of the six countries that signed the Thessaloniki Agreement - Romania, Bulgaria, FYR Macedonia, Greece, and Albania – maintained synchronous operation during most of 1999. Bosnia-Herzogovina was not synchronously connected, however. The Federal Republic of Yugoslavia did not sign the Thessaloniki Agreement despite the fact that in 1999 its network was synchronously connected to the first five signatories.

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- Ukraine and Moldova (countries that operate an interconnected power system that was originally developed in the 1970s and 1980s)

- Georgia, Armenia, and Azerbaijan (countries that share a high voltage network and may be able to form a Caucasus regional electricity market)

- Kazakhstan, Uzbekistan, Turkmenistan, Kyrgyzstan, and Tajikistan (the countries which drafted a Central Asia interconnection agreement in 1997).

Because Russia has electricity trade with a number of countries, it would not be correct to say that Russia belongs to a particular group. The simplest form of trade - export-import between neighboring countries - exists with Norway, Finland, and China. The more advanced form of trade - import, export and transit among a group of countries – exists in the Baltic Sea region and in the Caucasus region. Because the high-voltage power system connecting the Urals with western Siberia passes through Kazakhstan there are complex issues associated with Russia-Kazakhstan electricity trade.

Additional information about the current situation is presented in Appendix E.

Chapter 3. Measures Needed to Support Export, Import and Transit

It is important to facilitate the creation of conditions in each country that are essential for expanded trade, and also support the creation of competitive regional electricity markets. New institutional arrangements and reforms are needed at two levels: national and regional. Activities at the national level provide the basic foundation for establishment of competitive electricity markets. The transformation of vertically integrated power companies into separate generation, transmission, and distribution companies can only happen at the national level, for example. To obtain generation cost savings and to increase the competitiveness of the electricity market it is necessary to establish cooperation at the regional level and form regional markets. Finally it is useful to consider the possibility of integration of various regional markets into larger markets.

This chapter begins with a discussion of measures needed to support export, import and transit at the national level, and then proceeds to the regional level.

3.1 Energy strategy at the national level

At the national level it is useful to develop a strategy on how to achieve an electricity market that is truly competitive, and how to strengthen competition. In small countries the creation of a competitive national electricity market will be difficult when most of the thermal generation is provided by a small number of generating stations and most of the national hydroelectric generation is provided by one or two rivers.[10] If the country has only a few major cities there

[10] A cascade of hydro stations cannot be divided into competing companies because the upstream reservoirs control the amount of water flow available to the downstream reservoirs. Revenues are maximized when all of the reservoirs on the river are operated in a coordinated dispatch schedule.

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may be a small number of commercially viable distribution companies. If the wholesale market will not have many buyers and many sellers at the national level, a useful measure is to join a market formed by several countries, or possibly to join the electricity market of a neighboring country that is large enough to have many buyers and many sellers.

A nation that would like to participate in a regional electricity market may choose one of the following strategies:

1. *Start with a national market*. If possible and appropriate, establish a competitive market and related rules at the national level, and then see whether a regional market can be developed. The essence of this strategy is to implement reforms as soon as possible, without waiting for neighbor countries. If it appears that the regional electricity market will develop slowly and that addressing competition issues will facilitate regional cooperation, this is a sensible approach. It is advantageous to be the first in the region to prepare for an electricity market that will develop sooner or later. Being first to have an independent TSO, grid code, market rules, and so forth will give a competitive advantage.

2. *Start with a regional market* . The essence of this strategy is to avoid duplication of effort and ensure that the legal and regulatory framework will be harmonized among all the countries in the region. One approach is to join an electricity market that is already operating in a group of countries, by accepting the market rules and industry structure already established by that group. For example, the Baltic countries could try to join the Nordic electricity market (Norway-Sweden-Finland-Denmark). Another approach is to form a new and independent regional market by negotiating an agreement to prepare one set of TSO rules and a harmonized regulatory framework for the market.

A nation that has only a weak commitment to participate in a regional electricity market might establish a competitive market at the national level, and then invite other countries to participate only if it is advantageous to let them join the market. For example, one idea is to let producers in neighbor country X have access to customers in country Y only when producers in Y have access to customers in X. Until there is *reciprocity*, X and Y operate independent national markets. Although this strategy might be beneficial for producers, it is not likely to serve the interests of consumers. Normally consumers will benefit from expanding the market geographically.

Some of the member states of the EU have suggested a need to restrict trade between an EU country and any non-EU country in which electricity market access conditions relating to unbundling, transmission fee, grounds for refusal of access, and dispute settlement are not equivalent to the market access conditions prevailing inside the EU. This concept has never been clearly defined, because access conditions vary considerably within the EU. Nevertheless, in April 1999 the European Commission recommended that "bilateral agreements or understandings could be concluded between the EU and third countries enabling the establishment of a reciprocity-based framework ensuring equivalent market opening and a level playing field."[11] The first test of this concept is the negotiation of a bilateral agreement between

[11] European Commission, *Second Report to the Council and the European Parliament on Harmonization Requirements: Directive 96/92/EC concerning common rules for the internal market in electricity*, Page 24.

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the EU and Switzerland. If this approach were fully implemented, Hungary, for example, would trade with Austria on the basis of a reciprocity agreement between the EU and Hungary. This approach might not be consistent with the trade provisions of the Energy Charter Treaty.[12]

3.2 Actions that can be implemented at the national level

To create the conditions essential for expanded trade and to support the creation of competitive regional markets, the different entities involved in electricity market (Ministry, Regulator, Transmission Company, Generation and Distribution Companies) should work together to establish:

- A primary legislative framework that will support the creation of competitive regional and international markets
- A secondary regulatory framework to implement the basic principles defined by legislation
- A clear understanding of who is responsible for writing the electricity market rules, who is responsible for approving and issuing them, and who is responsible for implementing them, at the national and regional levels.

Reforms at the national level are the foundation for the development of competitive electricity markets at the regional levels. If competition is possible in the domestic electricity market, then it will be only natural to expand the geographic scope of the marketplace to the regional level so that buyers and sellers may be located in neighbor countries with a similar legal and regulatory framework. On the other hand, if reforms are not implemented at the domestic level it is less likely that consumers will benefit from the development of regional markets. To establish a competitive electricity market it is necessary to have an energy law or electricity law, an independent regulatory agency, and a transmission system operator that is independent of generating companies and distribution companies, in management terms.[13]

3.2.1 Primary legislative framework

The legislative framework should distinguish different types of international agreements and clarify who has the authority to sign and negotiate international agreements dealing with the

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Download at http://www.europa.eu.int/comm/energy/en/elec_single_market/florence/index_en.html . See also Angus Johnston, The EC Energy Law 1999: Reciprocity and the Gas and Electricity Directives, 4 CEPMLP 21 (1999). Available at http://www.dundee.ac.uk/cepmlp/journal/html/article4-9.html

[12] This issue was debated in a Eurelectric conference held in January 2000.

[13] In Germany the Energy Industry Law establishes the basis for implementation of EU Directive 96/92/EC but the energy regulator is the European Commission. The relevant national regulator is the anti-monopoly board. This approach is not suitable for CEE and Eurasia.

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electricity market.[14] Legislation should define the roles of Government Representatives and Regulators in at least the following three types of agreements:

1. Declarations of state policy – for example, policy concerning future interconnections. Normally this type of agreement will be signed by Government Representatives. A government may decide to support interconnections that ensure synchronous operation with UCTE rather than interconnections that will not improve power system stability.

2. Agreements to harmonize transmission tariffs, network access requirements, and electricity market rules among several countries, and agreements concerning compensation payments among TSOs. These agreements may be signed by Government Representatives, TSOs, and Regulators.

3. Interconnection agreements that define the general guidelines for synchronous operation among two or more countries, and define the obligations of each country to protect and stabilize the high voltage network. Normally this type of agreement is signed by Transmission System Operators but it may also require approval by Government Representatives.

Ideally, the legislative framework should also clarify the Regulator's role concerning agreements that are more commercial in nature:

4. Agreements to construct new power lines or interconnections across national borders. These agreements are signed by the entities who will own the fixed assets or provide long-term financing for the fixed assets.

5. Transit agreements designed to support individual transactions between buyer and seller. These agreements may be signed by TSOs but subject to approval by Regulators.[15] These agreements are not necessary in a competitive electricity market with many transactions among many buyers and sellers, and ideally transmission tariffs should not be transaction-based. If the legal and regulatory framework of the electricity market requires the TSO to negotiate a lot of transit agreements to support a lot of buyer-seller transactions, these agreements should be monitored by the regulator and investigated only when the regulator has some reason to suspect abuse.

6. Bilateral contracts to buy and sell electric energy, when buyer and seller are located in different countries. These commercial agreements are signed by companies or state enterprises in the electricity market.

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[14] The Final Act of the European Energy Charter Conference was signed on 17 December 1994 by government representatives such as the Minister of Energy of Estonia. For each Contracting Party the process of ratification of the Treaty demonstrated that the Parliament agreed with the person who signed the document.

[15] When electricity transit involves national security considerations (for example, electricity transit from the main part of Russia to Kaliningrad), Government Representatives may also have an important role.

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7. Agreements to form a spot market or exchange for trading physical products. These are typically commercial agreements among the owners of the spot market operator or exchange operator. The Regulator will have an interest in monitoring performance to identify abuses.

8. Agreements to trade financial products such as futures contracts or forward contracts. These are purely commercial agreements and they are similar to agreements to form a spot market.

A common problem is a situation in which the government decides that the power sector will be restructured, but there are no laws or regulations on trade with neighbor countries and therefore the vertically integrated power system tries to maintain "single buyer" control over exports and imports. When a law requires a transmission company or transmission division to be formed, the legislative framework must clearly separate the supply function (buying and selling electric energy) from the network service function (ownership and operation of the "wires business").

The legislative framework should establish authority for approval of electricity market rules. The best approach is to give this authority to an independent energy regulatory agency. In some countries the legislative framework also establishes a timetable for providing different categories of customers with open access to the transmission network.

If there is a need to form a regional interconnection, a regional spot market, or a regional electricity market operator, the legislative framework should clearly define who has the authority and responsibility to negotiate the necessary agreements. If the legislation states that approval is needed at the highest level (the Parliament, the Cabinet of Ministers, or the President) then it will be necessary to clarify who will write the documents that will be submitted for approval. Because electricity networks are technically complex, it is not reasonable to expect politicians to resolve all of these questions; a lot of the work must be done by Regulators and Transmission System Operators.

Each country participating in international electricity trade should provide its trading partners with information on the legislative framework for electricity trade. Normally the legislative framework may be defined as the set of laws passed by the Parliament. In some countries, however, the Parliament allows the President to make key decisions on power sector restructuring and privatization. This situation can occur when a weak Parliament and a strong President face an urgent need for reform. Under these conditions the legislative framework may be defined as the combination of laws and Presidential decrees.

3.2.2 Secondary regulatory framework

The regulatory framework consists of regulations and decisions made by government organizations such as the energy Regulator, the Ministry responsible for the power sector, and the Cabinet of Ministers. This framework must include:

- Licensing or authorization of participants in the domestic market, including some of the participants in export, import, and transit agreements.

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- License conditions designed to establish the reliability and quality of electric service to domestic and international customers. For example, the regulator may choose to set conditions under which both groups are affected by a sudden loss of generating capacity. The load shed plan might include export customers as well as domestic customers.

- Guidelines for access to national-level information about market transactions. Spot market prices must be available via Internet on a daily basis and perhaps even on an hourly basis.[16] The guidelines may also describe access to information from international organizations such as ETSO although this information will be regulated at the international level.[17]

- Guidelines to protect confidentiality of contracts and other documents. The TSO must not release contract prices and other sensitive commercial information to other parties such as companies affiliated with the TSO.

- Tariff issues, which are described below.

The following tariff issues should be addressed:

1. *Network service tariffs*. For regional and international electricity markets the most important tariff issue is the definition of network service and the structure of the network service tariff. Perhaps the best solution is to define network service as access to all producers and consumers in the wholesale market regardless of national borders. The tariff can be structured as an energy charge plus a connection fee, with different connection fees for producers and consumers. Then the TSOs must agree on a system of compensation among each other. Under this approach the producer or customer does not have to pay transit tariffs to two or more countries. When he pays the TSO serving his network, that TSO might share the revenue with TSOs in other countries but the producer or customer does not have to worry about the sharing formula.

2. *Transmission costs borne by domestic consumers*. Transmission services offered by a TSO can be grouped in four categories: transit of electric energy from domestic producers to domestic consumers, from domestic producers to other TSOs (export), from other TSOs (import) to domestic consumers, and from one TSO to another TSO (transit). Obviously it would not be fair to ask domestic consumers to pay for all of these services. The TSO should reach agreement with other TSOs to determine how much of the cost of transmission will be paid by foreigners (including producers,

[16] When the spot market is owned and managed by an independent exchange operator there is no need for regulations requiring information to be posted on the Internet. Such regulations are needed only when the spot market is controlled by a state enterprise or affiliated with key participants in the electricity market.

[17] For EU member countries, Available Transfer Capacities in winter and summer are published at http://www.etso-net.org .

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consumers, and transit customers). At the national level the regulator must develop tariff methodologies to ensure that the allocation of transmission costs is fair to domestic consumers.

3. *Bundled tariffs*. In some countries the vertically integrated power system exports electric energy under a flat tariff per kWh so that generation, transmission, and ancillary services (balancing and reserves) are bundled together. Under this approach it is impossible to measure the portion of transmission costs borne by domestic consumers. This approach to export pricing should be rejected.

4. *Stranded generation costs*. If certain high-cost generating stations will not be able to compete in a regional electricity market but have signed long-term power purchase agreements, it may be necessary to add stranded costs to the tariff component that reflects the market price of generation.

5. *Ancillary service costs borne by domestic consumers*. Any country interconnected with other countries must participate in a coordinated system of dispatch to ensure that customer load is balanced with generation plus net imports. Generating capacity reserves are needed to ensure that load and generation can be balanced at all times. At the national level the regulator must develop tariff methodologies to ensure that the allocation of the cost of ancillary services (including capacity reserves) is fair to domestic consumers. These costs may be significant when a small country must maintain a large amount of reserve capacity to support exports of electricity generated at nuclear stations.

If the legislative framework does not contain a timetable for providing different categories of customers with open access to the transmission network, then this issue must be addressed by the regulatory framework. If the legislative framework places restrictions on the participation of generators in a regional electricity market (either to protect generators with environmentally preferred technologies, to protect certain high-cost generators that employ a lot of workers, or to restrict exports of low-cost hydroelectric generation) then the regulatory framework will have to explain exactly how these restrictions are applied.

3.2.3 Market rules

At the national level it is necessary to ensure that rules for electricity market operation are conducive to export, import, and transit. The method of preparing market rules depends on the strategy for participating in a regional electricity market:

1. *Develop national rules*. If the strategy is to establish a competitive market at the national level, and then see whether an international market can be developed, the draft and final market rules should be prepared at the national level. Later, if an international electricity market develops, the country may considering revising the market rules to suit the needs of its trading partners. If it is impossible to develop a competitive electricity market at the national level, the first draft of the market rules can be developed at the national but the final version must be developed at the regional level.

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2. *Develop or use regional rules*. If the strategy is to join an electricity market that is already operating in a group of countries, then it is necessary to accept the market rules already established by that group. It may be necessary to revise the national legislative and regulatory framework to comply with the international treaty or commitment (for example, EU membership). If the strategy is to join a group of countries and negotiate an international agreement to form a regional electricity market, then the market rules should be developed first by an international committee or working group and then adapted (if necessary) to local conditions. It will be necessary to ensure that the rules developed at the regional or international level are consistent with the national legal framework. It may be necessary to harmonize the national legislative and regulatory frameworks of the countries in the group, by introducing new legislation in each country.

3.3 Formation of an independent TSO

To support a competitive electricity market, a TSO should be independent in management terms from generating companies, distribution companies, large customers, and the government. The simplest and most transparent method of preserving the independence of the TSO is to make it a separate legal entity with transparent operations and broad governance. For example, in Central Europe the first TSO formed as a separate company is CEPS, a.s., which serves the Czech Republic. Unfortunately CEPS management is not independent from the parent company CEZ.[18] The creation of CEPS is an important step, although a greater degree of management separation will probably be needed to comply with the EU Electricity Directive.

The European Federation of Electricity Traders (EFET) has complained that some of the participants in ETSO are not TSOs but vertically integrated companies and are not releasing Available Transfer Capacity to the market.[19] EFET supports the independence of TSOs:

> TSOs need to be organized as separate legal entities (or divisions) from their supply and generation affiliates. For the sake of full transparency different ownership may even be preferred. We advocate that wherever a TSO is in the same ownership as a company or business generating and/or supplying power, the TSO should act entirely independently.[20]

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[18] Transmission system assets were transferred from the parent company to CEPS on 1 August 99. The CEPS Annual Report 1999 is available at http://www.ceps.cz/english/vyrocni_zprava/index.htm . CEPS is governed by a Board of Directors and a Supervisory Board. The Board of Directors of CEPS consists of the CEO of CEPS; the Finance Director of CEPS; and the former Director of Transmission System Development of CEZ. The Supervisory Board of CEPS consists of the 1st Deputy of the CEO of CEZ; the Director of the Electricity and Gas Department of the Ministry of Industry and Trade; and the Chairman of the trade union branch committee.

[19] For example, EFET's comment on the France-Spain interconnection is that "the available capacity on this interconnector (350 MW), which is to be allocated on a first-come, first-served basis, has already been reserved by EdF (250 MW) and Electrabel (100 MW) under long-term take-or-pay contracts." See EFET, "Further Development of the European Single Market in Electricity," http://www.efet.org Position Papers.

[20] European Federation of Energy Traders, *European Electricity Trading and a Single Market in Electricity*, presented at the European Electricity Regulation Forum, Florence, November 1999, page 3. See http://www.efet.org Position Papers.

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Some countries may choose to establish a regional Independent System Operator (ISO) to coordinate the work of the TSOs in the region.[21] If there will be a regional Market Operator responsible for both contract and spot transactions then this is a logical solution. However, it is possible to operate a regional spot market (in Nord Pool, for example) without a regional ISO.

3.4 Rules for regional electricity markets

3.4.1 Coordination among countries in the region

Every country needs to coordinate electricity import, export, and transit with countries to which it is connected. If a country is a member of a regional association such as Centrel then the country has an obligation to coordinate activities with all of the other members of the association. Three kinds of coordination are essential:

- *Compatibility among national policies*. Governments need to establish compatible national policies that facilitate export, import and transit.

- *Coordination among transmission system operators*. From a purely technical perspective this is necessary to ensure reliable operation of the power system. The rules and procedures for TSO coordination in UCTE and Nordel are already well defined. An interconnection agreement should be signed by all of the TSOs in an area of synchronous operation.[22]

- *Coordination among energy regulators*. To promote international electricity trade among a group of countries it is necessary for the energy regulators to try to harmonize the regulatory framework in those countries. Regular meetings of a committee of energy regulators can be held.

One of the issues to be discussed to ensure compatibility among national policies, is the placement of restrictions on the participation of generators in the regional electricity market. Four types of restrictions are relatively easy to implement in region outside the EU:[23]

1. Reciprocity provisions that limit the ability of a neighbor country's generators and suppliers to sell energy to qualified customers and distribution companies. For

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[21] Intelligent Energy Systems, *Review of Worldwide Experience with Independent System Operators*, a report for the World Bank, July 1999. IES is located at http://www.iesys.com.au/ies/home2.html .

[22] Unfortunately in April 1999 the Lithuanian Power Company did not sign the interconnection agreement with its neighbor power companies in Estonia, Latvia, Russia, and Belarus. The Defense Council of Lithuania decided that the power company should not sign an agreement with Russia, but the government did not prohibit the power company from signing agreements about interconnection with Poland.

[23] Restrictions can be imposed on electricity trade among EU member countries but only to protect environmentally preferred generating sources or perhaps "public service obligations" associated with CHPs whose heat supply is considered essential. Reciprocity provisions can be applied by the EU as a whole, in electricity trade with a non-EU country.

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example, one type of reciprocity provision prohibits generators and suppliers in Country B from selling energy in Country A unless the electricity market opening in Country B is raised to at least the level of Country A.

2. Capacity payment restrictions that limit the ability of a neighbor country's generators and suppliers to receive capacity payments from qualified customers and distribution companies. If domestic generators are entitled to negotiate or receive capacity payments then energy prices in the regional market can fall to the level needed to recover the variable costs of energy generation. Capacity payments will enable domestic generators to recover at least a portion of the fixed costs associated with investment in generating capacity.

3. Import taxes on electricity. For example, countries which agree to form an electricity market within a region could agree to place a tax on electricity imports from countries outside the region. Generators within the region would compete freely with each other.

4. Stranded cost provisions that enable generators to recover stranded costs through tariffs set by the Regulator. For example, a Regulator could impose a special surcharge on sales of energy to qualified customers and distribution companies in Country A, to pay for stranded costs incurred by generators in Country A.

It would not be very easy, however, to develop a coordinated policy to prevent "dumping" of electricity in a regional market. The essence of the concept of dumping is that a product should not be exported at a price level that is below the true economic cost associated with those exports. If the Regulator in Country A accuses a generator in Country A of dumping, there is a possibility to resolve the dispute at the national level. If Country A accuses Country B of dumping, however, the dispute must be resolved at the regional or international level. The only effective way for Country A to investigate the cost of power generation in Country B is to submit the dispute to a regional authority or court, or to an international authority such as the World Trade Organization.

3.4.2 Framework for electricity market development

The first step in preparing rules for regional electricity markets is to decide who should be responsible for the development of the legal and regulatory framework. Countries in each region face a choice among three policy alternatives:

1. *National framework*. Each country could develop its own legal and regulatory framework for the electricity market without giving legal authority to any regional organization. Two or more countries could meet to define the region within which a single electricity market should be formed. Through coordination among Government Representatives, Regulators, and TSOs it will be possible to achieve some degree of harmonization, if each country voluntarily agrees to modify its legal and regulatory framework to come closer to the market model or concept chosen by the Government Representatives and others.

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2. *Regional framework*. The countries outside the EU could form regional associations for the purpose of writing rules for international exchanges of electricity. For example there could be a Centrel region, a Baltic region, a Balkan region, and so forth. In each region new rules could be written by a working group or coordinating body representing the member countries.

3. *A framework similar to the EU framework*. On the basis of the EU Electricity Directive and decisions taken by the European Electricity Regulatory Forum, a standard framework for competitive electricity markets could be developed for use by all of the non-EU countries. A working group representing the non-EU countries could modify the text of EU rules so that the principles reflected in the EU framework can be applied to non-EU countries.

Option 1 is certainly the simplest from a political standpoint but it creates the risk that the various national markets will not be harmonized, and the benefits of regional trade will not be fully captured.

Option 2 represents a phased approach to market development, first establishing separate regional markets and later developing links among the regions. Option 2 enables each region to proceed at its own pace. For example, countries that have been invited to negotiate EU accession could draft rules for electricity trade, and in the second phase of market development the non-accession countries could join. Countries could develop expertise at the regional level that will be valuable when linkages among regions are developed in a later phase.

Option 3 is conceptually the simplest approach but politically very difficult to achieve. It would lead to the development of a framework for the whole region covered by the Energy Charter Treaty. From the standpoint of the accession countries, option 3 is attractive because it eliminates the need for a transition from non-EU rules to EU rules. However, there is a practical difficulty with option 3: the EU does not yet have a clear framework. The Electricity Directive ignores the development of spot markets; the EU does not have a clear policy on congestion management; the harmonization of use-of-network tariffs is still in an early stage of development; and there are no rules for electricity trade with non-EU countries, other than the principle of reciprocity and the release of information on Available Transfer Capacity. If the non-EU countries must wait for the 15 member countries of the EU to reach a consensus on these issues, reforms in the non-EU countries could be delayed.

If the EU member countries accept a vision of a broader electricity market, they will eventually need to expand membership of the institutions involved in developing the legal framework for electricity trade. Option 3 does not create an "internal market" defined by EU borders; it creates an even larger "area without internal frontiers" for the electricity market.[24]

[24] Option 3 may give a competitive advantage to companies that are already involved in the electricity market of the EU. However, these companies are already foreign investors in non-EU countries.

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3.4.3 Rules needed to protect grid stability

Because all countries in a synchronous interconnection have an interest in maintaining the reliability and stability of the network, the issue for which it is easiest to reach international agreement is the issue of network security. Even if neighbor countries have different approaches to power sector restructuring and privatization, the TSOs should be able to agree on the following issues:

- Rules for communication and exchange of data among dispatch centers
- Procedures for metering cross-border flows of electric energy
- Conditions under which spinning reserve and short-term (up to one hour) reserves can be made available to a neighbor country
- Identification of regional or "high-level" dispatch centers (if any)
- Procedures for enforcing dispatch instructions given to generating stations
- Procedures for reviewing applications to connect new countries to the high-voltage network
- Procedures for connecting new generators or new loads to the high-voltage network.

Normally all of these rules are written and enforced by TSOs and their associations such as UCTE and Nordel. To support competitive electricity market development the regulator may want to have the legal right to approve these rules, to ensure that these rules are not used to restrict trade. If there is a trade restriction, however, it is not likely that the problem will be overcome by rewriting the rules that protect grid stability. The source of the problem is likely to be inadequate metering equipment, an inadequate system of communication among dispatch centers, or control of the TSO by a vertically integrated company, or inadequate TSO transparency and governance.

3.4.4 Rules needed to define access rights to networks

Because there are already many interconnections among the high-voltage networks of countries in Central Europe and Eurasia, rules are needed to define access rights to these interconnections. If each country had a vertically integrated power system with a monopoly on import and export, the number of buyers and sellers would be relatively small and therefore the rules would be relatively simple. For example, some interconnections could be regulated by bilateral agreements. If each country restructures its power sector to create a competitive electricity market, however, there will be a large number of potential buyers and sellers who have the right to import and export. Three basic questions must be answered:

- Who has access rights to the interconnections?
- If congestion develops, how should it be managed? What is the least damaging way to allocate interconnection capacity when there is not enough of it?

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- If existing interconnections are inadequate, given the demand for transfer capacity, who has the responsibility for transmission system planning? Who has the responsibility to make investments in new transmission facilities to increase the available transfer capacity?

These questions have to be answered by all countries, with or without restructuring, and with or without privatization.

The European Union is discussing these issues and has not found a simple solution.

- *Access rights* are defined by the EU Electricity Directive, by national regulations that define qualified customers, by long-term contracts for use of transmission capacity, and by EU rules concerning competition. On one hand the Electricity Directive gives a large number of producers and qualified customers and distribution customers the right to negotiate supply agreements involving import and export. On the other hand the Directive does not explicitly give them access to available transfer capacity. If long-term contracts give available transfer capacity to a small number of market participants and competition is restricted, then the EU has the right to prohibit those agreements on a case-by-case basis.[25] The EU hopes that owners of interconnectors will voluntarily make capacity available to the market.

- *Congestion management* is being considered by the European Electricity Regulation Forum in cooperation with ETSO. On 31 March 00 the Forum agreed that the European Commission "will put forward a document outlining the proposals for the most appropriate regulatory approaches towards the allocation of interconnection capacity in the EU."[26] In general market-based approaches are preferred but no decision has been taken.

- *Investments in new interconnection capacity* are being influenced by the Trans-European Energy Networks (TEN) program, which subsidizes interconnection projects proposed by TSOs and national governments.[27] However, no one is specifically responsible for making sure that there will be enough transfer capacity.

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[25] "Agreements between undertakings which may affect trade between Member States and which have as their object or effect to prevent, restrict or distort competition within the common market are prohibited under Article 85 EC Treaty. Furthermore, any abuse by an undertaking of a dominant position is a substantial part of the common market is prohibited under Article 86 EC Treaty. The Commission … will examine the contracts governing the use of interconnectors with a view to evaluate to what extent these restrict competition within the meaning of Article 85 or 86." European Commission, *Second Report to the Council and the European Parliament on Harmonization Requirements: Directive 96/92/EC concerning common rules for the internal market in electricity*, 16 April 99, page 10.

[26] *Conclusions of the Fifth Meeting of the European Electricity Regulation Forum*, Florence, 30-31 March 2000, pages 5-6.

[27] See http://www.europa.eu.int/comm/energy/en/tn_2_en.html

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> The Commission assumes that the private sector will invest in interconnection capacity when it is needed.[28]

It is possible that these issues will be simpler to resolve in non-EU countries because long-term transmission contracts are less common in the formerly socialist countries.

On its web site the ETSO publishes Available Transfer Capacity (ATC) for all EU countries, together with definitions of ATC, and there appears to be a consensus among European organizations that this information is accurate and useful. It would be useful to publish ATC for non-EU countries, according to the same procedures.

For the governments of Central Europe and Eurasia, the preparation of rules concerning access rights and congestion management will appear to be a "low-cost" activity compared with investment in transmission interconnections. For example a government could give access rights to a small number of generating companies and large industrial customers, and manage congestion by rationing capacity, giving first priority to long-term bilateral agreements and second priority to the spot market. If the rules are unnecessarily restrictive, they will have a negative effect on economic development but they will not cause a direct expenditure from the state budget. On the other hand, investments in new interconnection capacity are obviously expensive. It is unlikely that Ministry energy strategies or five-year plans will result in any real investment. The financial resources can come only from electricity tariff increases or from long-term financing made by possible by long-term import and export agreements or by a very favorable financial outlook for interconnection projects.[29]

There are three basic approaches to the problem of attracting new investment needed to remove capacity bottlenecks in transmission networks. The ownership structure of the transmission sector can take one of the following forms:

- *Monopoly of transmission system planning and ownership*. The national transmission company may be given a long-term monopoly on the ownership of all existing and future transmission networks, so that no other company is permitted to construct interconnections or improvements to the horizontal network. The *horizontal network* is the part of the transmission system which is used to transmit electricity between countries and within the country.[30] This is a reasonable solution when the transmission company is financially healthy and able to invest in the improvements needed to prevent or eliminate congestion. The monopoly rights of the transmission company may be stated as a license condition, for example. However, the

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[28] European Commission, *Second Report to the Council and the European Parliament on Harmonization Requirements*, 16 April 99, page 13.

[29] To promote economic development the World Bank, the EBRD, and the Asian Development Bank may choose to approve loans for interconnection projects that are not backed by long-term import and export agreements. For such projects the forecast level of transmission service revenue would have to be high enough to persuade the banks that their financial risk will be acceptably small.

[30] See Appendix B for the definition issued by ETSO.

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transmission company must also be given an obligation to construct transmission capacity to meet the needs of the electricity market, even if that new capacity will adversely affect a generating company or distribution network affiliated with the transmission company.

- *Monopoly of transmission system planning with multiple ownership of facilities*. The existing transmission company may be given ownership of the existing transmission network and the right to be a TSO, as well as the right to conduct transmission system planning for the entire country, but the transmission company and other qualified companies and consortia may be given an opportunity to construct interconnections and improvements to the horizontal network. This is a reasonable approach when a regional market is being created but the national transmission companies are unable to finance the necessary interconnections or are unable to make the investments needed to prevent or eliminate congestion after the regional market will be opened. In Europe it is normal to allow new consortia to own and construct undersea cables linking countries. The same principle could be applied to interconnections on land (for example, Lithuania-Poland). Any company that hopes to make a profit by removing a transmission capacity bottleneck will be invited to submit a license application. The result is that a country will have two or more transmission companies, but only one TSO.

- *Competitive approach to transmission system planning and ownership.* The existing transmission company may be given ownership of the existing transmission network, but other qualified companies and consortia may be given an opportunity to develop their own transmission system plans and to construct interconnections and improvements to the horizontal network. If the national grid functions as a single grid from a technical standpoint, there is no reason to create two or more TSOs. On the other hand, if the national grid actually consists of two horizontal networks with asynchronous operation or with limited transfer capacity between them (as in Denmark, for example), it is possible to establish two TSOs.

At the national level, the choice between these three options depends in part on the way citizens and customers regard the existing transmission company. If the company has failed to complete interconnections that were promised years ago, or if it has provided unreliable service, it has not "earned" the right to be a monopoly. The issue of attracting investment in the transmission network is not only a national issue, however. Because there will be a need to harmonize the framework for the regional electricity market, it may be a good idea to try to make a regional choice among these three alternatives.

The rules for investments in new interconnection capacity must address four questions:[31]

[31] Similar questions arise when new generating facilities are needed to provide ancillary services for the benefit of two or more countries.

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- *Planning*. Who should plan the new interconnections or the improvements to the horizontal network that are needed to support electricity trade? Who is responsible for transmission system planning when international trade is involved?

- *Approval*. What government agencies or institutions should approve plans for new interconnections or improvements to the horizontal network? Who should issue a license or permit to build new lines, cables, and substations?

- *Investment*. Who will be the owner(s) of the new interconnections or improvements to the horizontal network? Who is responsible for arranging sources of financing, managing the construction project, and owning the new assets?

- *Operation*. Who will be responsible for day-to-day operation and maintenance of the new interconnection? Although dispatch is the responsibility of the TSO, maintenance could be the responsibility of the owner of the interconnection (when an undersea cable or non-synchronous connection is involved, for example).

There is no question that tariff-setting will ultimately be the responsibility of the energy regulators. If the regulators are excluded from the planning and approval process, electricity customers will have a legitimate concern that they should not support tariff increases needed to pay for transmission investments that were never approved by the regulators. From the investor's point of view, therefore, it make sense to include regulatory agencies in the planning and approval process and not simply in the tariff approval process.

3.4.5 Rules for network service tariffs

At a minimum, the legal and regulatory framework for a regional electricity market must include a definition of network service tariffs (see section 3.2.2) and a procedure to enable TSOs to recover the cost of cross-border transactions. The rules should provide a commercial framework under which a qualified customer or distribution company in country A can purchase energy from a producer in country B. Market rules can be developed at the national level or at the regional level. For example, consider the example of an international electricity market in countries A and B. There are three kinds of transactions:

- *Transactions among market participants other than TSOs*. Producers, qualified customers, distribution companies, and independent suppliers may participate in the spot market and may sign bilateral contracts. The buyers may purchase electric energy under bilateral contracts or from the spot market. Participants may also trade in futures and forwards[32] without making payments to TSOs. Distribution network users make payments for the use of distribution networks.

[32] In a forward contract, the buyer agrees to sell energy to the seller and the period of delivery begins in the future (for example, a one-month period beginning 2 years from now). Both parties expect to see a physical delivery of energy. In a futures contract the potential buyer has an option to buy at some future date, or the potential seller has an option to sell at some future date. The parties to a futures contract are very interested in spot market prices but they do not really care how much energy is physically delivered.

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- *Payments made by transmission network users to their TSOs*. Transmission network users are the producers, distribution companies, and qualified customers with access to the transmission network (either through a direct connection to the high voltage grid or through the distribution network). Payment to a TSO gives the network user access rights to the combined transmission networks of A and B. Network users in country A pay the TSO in country A, and network users in country B pay the TSO in B.

- *Payments among TSOs*. The TSOs in A and B should make payments to each other so that the total amount of transmission service revenue collected by them is fairly distributed, given the costs incurred by the two TSOs.

The legal and regulatory framework must define the payments among TSOs and must identify the *regional network users* – the transmission and distribution network users who have access rights to the combined transmission and distribution networks of A and B. The list of regional network users will include producers, distribution companies or public utility suppliers,[33] large industrial customers, and perhaps independent electricity suppliers. The framework must establish a single definition of network service for regional network users, and a single tariff structure. For example, the rules may state that every regional network user pays a monthly connection fee per kW and every purchaser pays an energy charge per kWh delivered to the customer. Countries A and B must have similar tariff methodologies defining the payments made by regional network users to their TSOs.

Ideally, the tariffs for access to the horizontal network in countries A and B should have not only a similar structure, but the same tariff level. In that way the horizontal network would be equally available to all regional network users without discrimination. The tariffs for access to distribution networks may vary from one location to another, according to the cost of distribution and the extent to which rural networks are cross-subsidized by urban networks (in accordance with policies established by the relevant Ministry and energy regulatory agency).

When a regional electricity market is just getting started, it is not necessary for the regional network users in A and B to have exactly the same tariffs for access to the horizontal network. The electricity market can begin to work even when users in country A have low-cost network service and users in B have high-cost network service. Once a decision is made to create a regional electricity market, however, the ultimate goal of regulators in A and B should be the harmonization of all rules and tariff methodologies concerning transactions between regional network users and their TSOs, and a common tariff for access to the horizontal network.

Because the payments made by transmission network users to their TSOs should include an energy charge per kWh, the TSOs in each country will need to know how much energy was produced by each producer and how much was consumed by each transmission network user

[33] In most Central European countries the distribution company will have both a network service function and a supply function. However, it is possible to have completely separate companies - network service companies and public utility suppliers.

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(distribution company or qualified customer). However, the terms and conditions of transactions among market participants other than TSOs, may be considered a "national" issue.[34]

The European Energy Regulatory Forum is planning to implement a system of payments among TSOs in EU member countries. The EU is trying to encourage cross-border trade and create a payment system that will be understood by the participants in the European electricity market. Organizations such as EFET are trying to improve the transparency of cross-border trade. Therefore it should be very easy for non-EU countries to learn from EU experience in setting up a system of payments among TSOs.

If countries are able to harmonize their national and regional rules for transactions among market participants other than TSOs, the regional electricity markets will eventually merge into larger regional markets.

Chapter 4. Role of the Energy Regulator and Others in Electricity Imports, Exports, and Transit

4.1 Energy regulator

4.1.1 National level and regional level

Every energy regulator conducts activities that can be implemented at the national level. At the national level the regulator must comply with domestic laws and regulations but he is not obligated to implement international agreements. For example, the regulator listens to the concerns of regulated companies and consumers (and perhaps other interest groups such as potential investors and energy sector workers) and issues licenses and tariff decisions that affect the activity of regulated companies within the borders of one country. In Central Europe and Eurasia the regulated companies in the energy sector typically are legally registered and managed from offices located inside the country, and do not make investments outside the country. Therefore the regulator does not need to separate the "domestic" assets of the regulated company from its "foreign" assets and the regulated company does not report income earned from foreign investments. However, the regulator has to address licensing and tariff issues related to export, import, and transit. For example if there is a vertically integrated company with a monopoly on export, import, and transit, the regulator may decide that the total cost of domestic electricity generation plus domestic network operation plus electricity import is borne by domestic customers, but these costs are offset by the total revenues earned from export sales and from transit service. Although the regulator collects information from a domestic company

[34] A rough analogy could be made to mobile telephone networks. A mobile telephone user must pay a network service provider in his home country. If the customer is qualified to receive international service, he can travel from country to country without negotiating any agreements with network service providers outside his home country. The network service providers must compensate each other, and they all need to know which customers have paid for access to the international network, but each customer simply makes payments to his home network. There are no international rules about telephone rates to customers.

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about revenues from international transactions, he approves a tariff based on national laws and regulations. This is an example of "national level" activity.

To facilitate regional electricity trade, however, an energy regulator should also conduct activities that can be implemented at the international level. The regulator may have one or more of the following responsibilities:

- To apply the principles of international agreements that have been signed by the regulator's country
- Collaboration and coordination with regulators in other countries so that regional electricity and gas markets will be properly regulated
- *[For countries invited to join the EU]* To prepare for EU accession by interpreting and enforcing the Electricity Directive and other regulations concerning the internal market for electricity
- *[For countries invited to join the EU]* To participate in collaboration with other organizations in one or more chapters of the screening exercise under which the European Commission evaluates the readiness of countries for accession.

Activities at the regional level are not based on domestic laws and regulations. For example, it is impossible to measure Available Transmission Capacity (ATC) at the national level, with a single TSO. One of the principles of ATC measurement is that at each national border, estimates of transfer capacity for must be collected from both TSOs and compared.

Most energy regulators in Central Europe and Eurasia today lack the explicit legal authority to play a regulatory role on the regional level. Because their budgets and resources are small, some regulators may allow Ministries and TSOs to take the lead in international activity. However, a strong regulator is perceived by foreign investors, international financial institutions, and the EU as an essential part of the development of competitive electricity markets. This point is particularly important for the regulators in countries that have applied for EU accession and started the screening process on Chapter 14, Energy.[35] If the country has formed a regulatory agency it will be practically impossible for the government to negotiate the energy chapter of the screening exercise without involving the regulator in the process.

Under international law the actions of a regulator are subject to international agreements, such as the Energy Charter Treaty, that have been signed by the regulator's country. Although the energy regulator may be independent in the sense that he is "above" national political influence, the regulator is "below" the authorities that enforce the Energy Charter Treaty and other international agreements affecting the energy sector. Therefore it would be logical for the regulator to have some responsibility to apply the terms of these agreements.

[35] The home page for the enlargement process is http://www.europa.eu.int/comm/enlargement

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In principle, an international legal framework or some form of regional cooperation might be needed to ensure that companies or divisions under the regulator's jurisdiction (for example, distribution and transmission) are properly separated from companies or divisions that are unregulated (for example, generation and supply) or located in another country.[36] In practice, regulators in Central Europe and Eurasia try to deal with this issue at the national level. The possibility that a regulated company will shift profits to an unregulated business through transactions with an offshore company is a more serious question in the natural gas import/export business than in electricity import/export, but it may become an issue when the supply business is deregulated.

4.1.2 Activities that can be implemented at the national level

Under ideal conditions, the energy regulator has full responsibility for licensing and tariff activities described in section 3.2.2 including:

- Licensing of participants in the domestic market, including some of the participants in export, import, and transit agreements.
- Setting license conditions designed to establish the reliability and quality of electric service to domestic and regional customers
- Approving the definition of network service
- Approving the structure of the network service tariff and the level of network service tariffs
- Monitoring electricity tariffs to ensure that the allocation of transmission costs and the allocation of the cost of ancillary services (including capacity reserves) is fair to domestic consumers
- Developing guidelines for confidentiality of information contained in license applications and tariff applications. Encourage transparency by requiring licensees to submit requests to keep specific information confidential and demonstrate the need for keeping that information confidential.

The energy regulator should also advise the Government on the policy and legal framework for the electricity market. The regulator should have an opportunity to participate in drafting energy sector legislation and commenting on draft laws. The regulator should participate in the development of a national strategy on how to achieve an electricity market that is truly competitive, and how to strengthen competition (see section 3.1). If the legislative framework does not contain a timetable for providing different categories of customers with open access to

[36] For information on how the EU competition rules are enforced in the power sector, see Angel Tradecete, *The Role of EC Competition Policy in the Liberalization of EU Energy Markets*, download file *sp2000_003_en.pdf* from http://www.europa.eu.int/comm/energy/index_en.html

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the transmission network, then this timetable will need to be set by someone else, possibly the regulator and/or the institution responsible for the energy sector.

Market rules may be developed at the regional level or the national level, depending on the choice among alternative strategies for participation in an regional electricity market. If market rules and the grid code are developed at the national level, there should be a working group in which the regulator is a participant. In any case the draft market rules and the grid code should be submitted to the regulator for approval.

A number of entities, at the national and regional level, may be involved in developing guidelines for access to information regarding confidentiality of contracts and other documents. For example, a stock exchange issues regulations that give buyers and sellers of stock (in effect, everyone) access to financial information about the companies whose shares are traded on the exchange. The issue of confidentiality should be covered by electricity market rules, which should be subject to regulatory approval. Normally an electricity exchange gives buyers and sellers access to information about closing prices but not individual bids. The regulator should establish guidelines regarding the confidentiality of documents that are prepared for license and tariff applications and are not required for any other purpose.

4.1.3 Activities that can be implemented at the regional level

The rules for regional exchanges of electricity include three major components:

- Rules needed to protect grid stability
- Rules needed to define access rights to networks, to select methods of managing congestion, and to assign responsibility for planning and investments in new interconnection capacity
- Rules for network service tariffs, including payments among TSOs and payments made by transmission network users to their TSOs.

Because there needs to be a harmonization of the legal and regulatory framework and electricity market structures among all countries participating in regional electricity trade, there is a need for regional cooperation to develop modified EU rules (see section 3.4.1). The role of the regulator varies, depending on the type of rules to be developed:

- *Grid stability*. This is a task for TSOs and there is no need for the regulator to get involved except to ensure that the TSOs do not use these rules to restrict the development of a competitive electricity market.
- *Access rights, congestion, interconnection*. These questions must be discussed by Ministries, regulators, and TSOs at the regional level. The regulators from individual countries have an advisory role. An international agreement could give authority to publish Available Transfer Capacities to an entity such as ETSO.
- *Network service tariffs*. The rules defining payments among TSOs and payments made by transmission network users to their TSOs should be resolved by cooperation

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among national regulators. Tariff issues are best addressed by regulators rather than Ministries. Ideally a single set of rules could be established through regional cooperation. The rules defining transactions among market participants other than TSOs can be established in each country at the national level, or established in regional electricity trading arrangements.

4.2 Government representative

In every country there is one ministry with primary responsibility for the electric sector, and in some countries this ministry is also regarded as the "owner" of power sector assets. It may be a Ministry of Economy, Ministry of Energy, or Ministry of Industry and Trade, or other authorized Ministries. This Government representative should play a key role in developing the policy framework for the electricity market. For example, a Ministry has primary responsibility for drafting energy sector legislation and commenting on draft laws. A Ministry should also take the lead in developing a national strategy on how to achieve an electricity market that is truly competitive. If the legislative framework does not contain a timetable for providing different categories of customers with open access to the transmission network, then the Ministry should take the lead.

Unless an independent TSO has already been formed, the Ministry will play a key role in establishing a TSO either as an independent company or as a daughter company in which the management of the TSO is not controlled by the holding company. If market rules and the grid code are developed at the national level, the working group may be led by the Ministry and at a minimum the Ministry should be a participant. The Ministry should support domestic power sector reform to facilitate competition, including competition for exports and imports. Government policy in the electric sector should encourage a transition toward electricity trade among companies or commercialized enterprises and away from trade based on government-to-government involvement. Design of the reformed power sector should consider the historical government control of transmission and dispatch operations for political purposes.

The Ministry conducts activities that can be implemented at the regional level and has several responsibilities in the electricity sector:

- To interpret and enforce the terms of international agreements, such as the Energy Charter Treaty, that have been signed by the Ministry's country
- To participate in negotiations with other countries to establish regional electricity markets
- *[For countries invited to join the EU]* To prepare for EU accession by interpreting and enforcing the Electricity Directive and other regulations concerning the internal market for electricity
- *[For countries invited to join the EU]* To participate in one or more chapters of the screening exercise under which the European Commission evaluates the readiness of countries for accession.

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In the development of rules for regional exchanges of electricity, the Ministries of different countries can play a key role in drafting the rules that define access rights to networks. The role of the Ministries may be summarized as follows:

- *Grid stability*. There is no need for Ministry involvement because this is a task for TSOs in cooperation with regional associations such as UCTE and Nordel.

- *Access rights, congestion, interconnection*. Because decisions concerning interconnection (or disconnection) with neighbor countries involve energy security, it is appropriate for Ministries to make policy recommendations and participate in bilateral negotiations on new interconnections.

- *Network service tariffs*. Ministries may be involved in establishing a regional forum for discussion of these issues, but tariff issues are best addressed by regulators.

In some countries the Ministry may collect and disseminate data on electricity sector statistics, including export, import, and transit, but this role is not essential; the task of data collection and dissemination may be given to an regional organization such as UCTE.

4.3 Transmission System Operator

The TSO should have the primary responsibility to prepare a Grid Code. If the TSO is organized as an independent company it should also have input into the preparation of Market Rules. One of the difficulties facing regulators in Central Europe and Eurasia, however, is the fact that in many countries the TSO is part of a vertically integrated company or has a management that is controlled by a holding company with generation and distribution assets. If the TSO is not independent, and if Market Rules must be prepared at the national level, the rules can be prepared by a Ministry or regulatory body with assistance from foreign advisors. If Market Rules must be prepared at the regional level it is possible to establish a working group in which TSOs, regulators, and ministries are represented.

TSOs should play a key role in developing rules for regional exchanges of electricity:

- *Grid stability*. These rules should be developed by TSOs and made available on the Internet.

- *Access rights, congestion, interconnection*. These questions must be discussed by TSOs together with Ministries and regulators. The data needed to calculate Available Transfer Capacities must be provided by TSOs to an regional entity such as Centrel or to an international entity such as ETSO.

- *Network service tariffs*. A regional organization representing TSOs should prepare draft rules defining payments among TSOs, and submit the draft rules to the national regulators or a council representing the national regulators. On the basis of information provided by ETSO and the European Electricity Regulation Forum, a working group appointed by national regulators should draft rules for payments made

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by transmission network users to their TSOs. The TSOs should have an opportunity to comment on these draft rules before they are finally approved.

Because ETSO is already established and has experience with these issues, it would be logical for ETSO to either expand its membership to non-EU countries, or form a sister organization with the participation of UCTE and all of its non-EU members, and also encourage the formation of regional organizations comparable to Centrel.

TSOs are the key players in the day-to-day operation of an regional electricity market. Once the rules for regional exchanges of electricity are approved, it is largely up to the TSOs to implement cross-border transactions.

4.4 Initial steps to support competitive regional electricity markets

Given the current conditions described in Chapter 2, it will take some time to implement all of the measures needed to support export, import and transit. It is important to develop a set of priorities so that Regulators and others can identify the next steps that are most urgently needed to support the creation of competitive regional electricity markets. A suggested list of initial steps is as follows:

1. *Elimination of non-payment problems in wholesale markets*. All of the generators, public electricity suppliers and distribution companies, qualified customers, independent suppliers, and other participants in the wholesale electricity market should be able to transact business without any serious non-payment problems. The wholesale market should be free of non-payment problems, even if public electricity suppliers have an obligation to serve certain categories of customers (for example, military bases) that do not pay for electricity received.

2. *Formation of a TSO*. Create a TSO that is legally separate from generation companies and distribution companies, and is managed by representatives of government agencies, research institutes, and other organizations that are not under the control of a vertically integrated power company or holding company in the power sector. Although the owner of the TSO might be a state-owned holding company, management of the TSO must be independent of generation and transmission companies.

3. *Restriction or elimination of barter in international electricity trade*. To support a competitive regional electricity market it will be necessary to establish payment for network services and ancillary services in freely convertible currency or hard currency. It is impossible to support spot markets and difficult to develop competitive bilateral contract markets, unless all transactions are paid in currency.

4. *Establishment of a framework for Third Party Access (TPA) at the national level*. To support a competitive regional market it is necessary to create the legal and regulatory framework for qualified customers to buy electricity from producers. The bilateral contract market must include qualified customers. Regulated TPA is more

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transparent than Negotiated TPA, but both forms are acceptable under the EU Electricity Directive.

5. *Formation of a regional association of countries committed to promoting electricity trade.* It is useful to identify a specific set of neighbor countries who will work together to promote electricity trade. Programs for the exchange of information and cooperation among Government representatives, Regulators, and TSOs can then be organized for a specific group of countries.

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APPENDIX A

Proposed Glossary of Terms
Used by the Export Import Working Group

Term	Definition
Electricity trade	Scheduled flows of active power between two countries or among three or more countries, and payment for imported energy and transit services based on signed contracts for electricity export, import, and transit.
Electricity transit	Scheduled flows of active power among three or more countries, based on an agreement in which at least one of the countries is neither an exporter nor an importer. The country which neither exports nor imports power, under the agreement, is a transit country and is compensated for making possible the physical flows of energy necessary for other countries to export or import power. Electricity transit is one form of *electricity trade*.
Swap agreement	An international agreement to provide *electricity transit* services which are defined by the delivery and receipt of energy at national borders, regardless of physical flows within the transit country. For example, if transit country A receives electricity from B and delivers it to C, a swap agreement enables A to collect payment for transit service even when there is no physical flow of electrons from B to C.
Bilateral contract	Any contract which is signed by only two parties. Such a contract may include a description of services to be provided by a third party, which did not sign the agreement.
Open access	Any procedure approved by the government of a country or a group of countries, which enables electricity producers and consumers to negotiate contracts with each other.
Producer	(a) an independent company that generates electricity and has no transmission or distribution activities or (b) an undertaking that generates electricity and is independent, in management and accounting terms, from undertakings involved in transmission and distribution activity.
Grid Code	A document containing the minimum technical rules for connection to the network and maintenance of network stability, security and reliability, mandatory for all market participants. This document must be prepared by a transmission system operator and approved by a regulatory body (independent regulatory agency or ministry) representing the government of the country in which the TSO is located.
Market Rules	A document containing rules for the operation of an open electricity market. This document must be prepared by a committee representing the interests of different market participants, and must be approved by the regulatory bodies (independent regulatory agency or ministries or both) representing the governments of all of the countries in which the electricity market is located. If the electricity market exists in only one country then it is approved by only one regulatory body.
Open electricity market	An electricity market with open access.

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APPENDIX B

Glossary of Terms Used in the EU Electricity Directive, Reports Issued by the European Transmission System Operators, the Statistical Yearbook of the UCTE, and the Energy Charter Treaty

Term	Definition	Source of definition
Generation	The production of electricity	Directive 96/92/EC
Producer	A natural or legal person generating electricity	Directive 96/92/EC
Autoproducer	A natural or legal person generating electricity essentially for his own use	Directive 96/92/EC
Independent producer	(a) a *producer* who does not carry out electricity transmission or distribution functions in the territory covered by the system where he is established; (b) in [EU] Member States in which vertically integrated undertakings do not exist and where a tendering procedure is used, a *producer* corresponding to the definition of point (a), who may not be exclusively subject to the economic precedence of the interconnected system	Directive 96/92/EC
Transmission	The transport of electricity on the high-voltage *interconnected system* with a view to its delivery to final customers or to distributors	Directive 96/92/EC
Distribution	The transport of electricity on medium-voltage and low-voltage distribution systems with a view to its delivery to customers	Directive 96/92/EC
Customers	Wholesale or final customers of electricity and distribution companies	Directive 96/92/EC
Wholesale customers	Any natural or legal persons, if the Member States recognize their existence, who purchase or sell electricity and who do not carry out transmission, generation or distribution functions inside or outside the system where they are established	Directive 96/92/EC
Final customer	A customer buying electricity for his own use	Directive 96/92/EC
Interconnectors	Equipment used to link electricity systems	Directive 96/92/EC
Interconnected system	A number of transmission and distribution systems linked together by means of one or more *interconnectors*	Directive 96/92/EC
Direct line	An electricity line complementary to the *interconnected system*	Directive 96/92/EC

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Term	Definition	Source of definition
Economic precedence	The ranking of sources of electricity supply in accordance with economic criteria	Directive 96/92/EC
Ancillary services	All services necessary for the operation of a transmission or distribution system	Directive 96/92/EC
System user	Any natural or legal person supplying to, or being supplied by, a transmission or distribution system	Directive 96/92/EC
Supply	The delivery and/or sale of electricity to customers	Directive 96/92/EC
Integrated electricity undertaking	A vertically or horizontally integrated undertaking	Directive 96/92/EC
Vertically integrated undertaking	An undertaking performing two or more of the functions of generation, transmission and distribution of electricity	Directive 96/92/EC
Horizontally integrated undertaking	An undertaking performing at least one of the functions of generation for sale, or transmission or distribution of electricity, and another non-electricity activity	Directive 96/92/EC
Tendering procedure	The procedure through which planned additional requirements and replacement capacity are covered by supplies from new or existing generating capacity	Directive 96/92/EC
Long-term planning	The planning of the need for investment in generation and transmission capacity on a long-term basis, with a view to meeting the demand for electricity of the system and securing supplies to customers	Directive 96/92/EC
Single buyer	Any legal person who, within the system where he is established, is responsible for the unified management of the transmission system and/or for centralized electricity purchasing and selling	Directive 96/92/EC
Small isolated system	Any system with consumption of less than 2500 GWh in the year 1996, where less than 5 % of annual consumption is obtained through interconnection with other systems	Directive 96/92/EC
Regulated third party access	A regulated system of access procedure, giving eligible customers a right of access, on the basis of published tariffs for the use of the transmission and distribution systems, that is at least equivalent, in terms of access to the system, to the negotiated access procedure and the single buyer procedure described in Chapter VII of Directive 96/92/EC.	Directive 96/92/EC (wording based on Article 17, paragraph 4)
Qualified customers	*Customers* who have the legal capacity to conclude supply contracts with supply undertakings, in accordance with Articles 17 and 18 of Directive 96/92/EC. Each Member State shall publish by 31 January each year the criteria for the definition of qualified customers inside the territory of that	Directive 96/92/EC (wording based on Article 19, paragraphs 3 and 4)

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Term	Definition	Source of definition
	Member State.	
Eligible customers	*Qualified customers*	Directive 96/92/EC
Offsetting or superimposing counterdirected flows	If over an electricity line between A and B one contract is concluded to transport e.g. 100 MW in direction A and a second contract over the same time is concluded to transport e.g. 80 MW in direction B, then only 20 MW have to be physically transported in direction A. Thus, counterdirected contractual flows can be superimposed in order to cancel each other out. Consequently, the contractual capacity of an electricity line can be significantly higher than its physical capacity.	2nd Harmonization Report on 96/92/EC
Dispatching of generation	As the total capacity of power plants is not necessary to cover electricity demand, except during absolute peak hours, some mechanism has to be set up to decide which power plant should operate and which plant should be idle or on stand by. The selection or drawdown of the power plants for generation is called dispatching. Usually, it is the independent system operator that makes this decision according to objective and non-discriminatory criteria (merit order).	2nd Harmonization Report on 96/92/EC (Annex: Definitions)
Countertrading	If despite superimposing of counterdirected flows the resulting physical flow reaches the capacity of the transmission line, a situation of congestion or bottleneck exists in the resulting direction. Any further contractual transaction in the congested direction can only be carried out, if at the same time e.g. the system operator arranges a corresponding contractual flow in the opposite direction. To achieve this the system operator has to purchase or sell electricity from generators, or even consumers, that are willing to increase or decrease generation/consumption.	2nd Harmonization Report on 96/92/EC (Annex: Definitions)
Redispatching	This is an alternative to resolve an existing bottleneck, similar to *countertrading*. In case of redispatching the system operators of the concerned areas do not engage in offsetting trading contracts, but directly change the dispatching order of the power plants to create overall electricity flows which remain within the limits of the transport line constraints.	2nd Harmonization Report on 96/92/EC. See also ETSO, *Evaluation of congestion management methods for cross-border transmission*
Market splitting	This is another alternative to deal with a bottleneck, usually applicable in systems which already have a common spot market. As a reaction to the occurrence of congestion, the market operators provide for the possibility that there are different spot market prices on either side of the bottleneck. Thus, electricity is the area which is oversupplied becomes cheaper than electricity in the undersupplied area.	2nd Harmonization Report on 96/92/EC (Annex: Definitions). See also ETSO, *Evaluation of congestion management methods*

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Term	Definition	Source of definition
	Consequently fewer market participants are interested to purchase from the area which becomes more expensive, and the resulting flow over the bottleneck is reduced.	*for cross-border transmission*
Transaction oriented tariff	Equivalent to *point-to-point tariff*, this method of tarification calculates a transmission fee on the basis of information about entry point (*source*) and exit point (*sink*) of the electricity contract. Thus, if an eligible customer shifts from supplier A to supplier B, the parties would have to recalculate the transmission fee depending on the location of the new supplier.	2nd Harmonization Report on 96/92/EC (Annex: Definitions)
Non transaction oriented tariff	Equivalent to *point of connection tariff* or *nodal tariff*, this tarification methodology divides the overall transmission system costs exclusively to separate connection fees (or network access fees) for the producer and the consumer. Thus, the connection fee for an eligible customer remains the same, irrespective of a change of supplier.	2nd Harmonization Report on 96/92/EC (Annex: Definitions)
Point-to-point tariff	Transaction oriented tariff	2nd Harmonization Report on 96/92/EC
Point of connection tariff	Non transaction oriented tariff	2nd Harmonization Report on 96/92/EC
Nodal tariff	Non transaction oriented tariff	2nd Harmonization Report on 96/92/EC
Counterdirected flows	Offsetting or superimposing counterdirected flows	2nd Harmonization Report on 96/92/EC
Total Transfer Capacity (TTC)	The maximum feasible power exchange which can be transmitted between the systems A and B reliably and without affecting the system security.	ETSO, *NTC and ATC in the Internal Market of Electricity in Europe*
Transmission Reliability Margin (TRM)	A portion of *Total Transfer Capacity* that is reserved to cover the forecast uncertainties or tie-line power flows due to imperfect information from market players and unexpected real time events.	ETSO, *NTC and ATC in the Internal Market of Electricity in Europe*
Net Transfer Capacity (NTC)	*Total Transfer Capacity* minus *Transmission Reliability Margin*: NTC = TTC – TRM	ETSO, *NTC and ATC in the Internal Market of Electricity in Europe*
Notified Transmission Flow (NTF)	In a studied time frame, the portion of *Net Transfer Capacity* that is occupied by already accepted transfer contracts	ETSO, *NTC and ATC in the Internal Market of Electricity in Europe*
Available Transfer Capacity (ATC)	*Net Transfer Capacity* minus *Notified Transmission Flow*: ATC = NTC – NTF	ETSO, *NTC and ATC in the Internal*

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Term	Definition	Source of definition
Capacity (ATC)	ATC = NTC – NTF	*Market of Electricity in Europe*
Horizontal Network	That part of the transmission system which is used to transmit electricity between countries and within the country. It contains the transmission system elements that are influenced significantly by cross-border exchanges.	ETSO, *Cross-border Tariffs for the Internal Market of Electricity in Europe*
Vertical Network	That part of the transmission system which is used to provide access of the generation to the Horizontal Network and provide access of the load to the Horizontal Network	ETSO, *Cross-border Tariffs for the Internal Market of Electricity in Europe*
Imports/exports (GWh)	Values that take into account the physical exchanges on the cross-frontier transmission lines, but in addition also exchange values on lines <= 110 kV outside of the interconnected transmission system and on the other hand values resulting with regard to international contracts (water claim). For presenting the operation of the interconnected transmission system only interconnected transmission lines, which are registered in these terms, are taken into consideration.	UCTE, *Statistical Yearbook 1998* (Terminology paragraph 2.15)
Electrical energy supplied to the network (GWh)	Energy that has to be delivered to ensure the required supply to meet the *national electrical consumption*. In the special case of a national network this is equal to the sum of the net electrical energy supplied by all power stations within the country, reduced by the amount used simultaneously for pumping and reduced or increased by exports to or imports from abroad.	UCTE, *Statistical Yearbook 1998* (Terminology paragraph 2.3)
Own consumption (GWh)	The electricity absorbed by the auxiliaries of the power stations and the losses in the main transformers of the power stations, and that consumed for pumping and the network losses. These consumptions are commonly called "consumptions of the electricity sector."	UCTE, *Statistical Yearbook 1998* (Terminology paragraph 2.1)
Electrical energy absorbed by pumping (GWh)	The electrical energy absorbed by the motor-pumps in raising the water into the upper reservoir for the generation of electrical energy. It should include the electrical energy consumed by the auxiliary equipment and transformer losses during pumping.	UCTE, *Statistical Yearbook 1998* (Terminology paragraph 2.4)
National net electrical consumption (GWh)	The sum of: (1) the amount of electrical energy supplied by the electricity service utility to ultimate consumers of the network under consideration, (2) the amount of net electrical energy produced or directly imported from abroad by industrial or commercial concerns on the network and used directly for their own needs or to directly supply ultimate consumers, and (3) the amount of electrical energy consumed by establishments (offices, workshops, warehouses etc.) of the	UCTE, *Statistical Yearbook 1998* (Terminology paragraph 2.1)

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Term	Definition	Source of definition
	electricity service utilities, but excluding the electricity absorbed by the auxiliaries of the power stations and the losses in the main transformers of the power stations, and that consumed for pumping and the network losses.	
Network losses (GWh)	The network losses occurring in transmission and distribution networks are calculated as the difference between the *electrical energy supplied to the network* and the *net electrical consumption*.	UCTE, *Statistical Yearbook 1998* (Terminology paragraph 2.18)
National electrical consumption (GWh)	*National net electrical consumption* plus *network losses*.	UCTE, *Statistical Yearbook 1998* (wording based on Terminology paragraph 2.2)
Physical load flow between neighbor countries (MW)	The balance of the physical load flows, measured at 3 and 11 a.m. (Central European Time) at the cross-frontier substations of transmission lines (>= 110 kV). In general, a unique metering point is used, in agreement between the partners.	UCTE, *Statistical Yearbook 1998* (Terminology paragraph 3.6)
Contractual net balance of exchanges (MW)	The difference between the contractual power from other countries (import) and the contractual power to other countries (export). These values include only medium-term and long-term exchange contracts with firm dispatchability of power during the high load hours. Contributions from power stations with joint operation are regarded as contractual power from other countries or to other countries. In any case of indispatchability of contractual power from other countries or to other countries, whatever the reason may be, it must not be taken into account within the contractual exchanges. The total of contractual exchanges represents the exchange balance with third countries.	UCTE, *Statistical Yearbook 1998* (Terminology paragraph 3.9)
Operating transmission line	An internal 400 kV network connection of a country, and/or an interconnected line >= 100 kV.	UCTE, *Statistical Yearbook 1998* (Terminology paragraph 4.9)
Interconnection	A connection (lines, cables and equipment, including transformers, etc.) that may be used to convey electrical energy in either direction between networks, between power stations, or between power stations and networks. An interconnection may exist within the limits of a single undertaking or among several undertakings, within one geographical area or among several geographical areas, within one country or among several countries.	UCTE, *Statistical Yearbook 1998* (Terminology paragraph 4.10)
Interconnected network	All *interconnected lines*, without regard to voltage, included within the limits of a single undertaking or among several undertakings, within one geographical area or among several geographical areas, within one country or among several countries.	UCTE, *Statistical Yearbook 1998* (Terminology paragraph 4.10)

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Term	Definition	Source of definition
	countries.	
Interconnected line	A line providing an *interconnection*.	UCTE, *Statistical Yearbook 1998* (Terminology paragraph 4.10)
Interconnected countries	Countries that are linked together by one or more *interconnections*.	UCTE, *Statistical Yearbook 1998* (Terminology paragraph 4.10)
Networks in parallel	Interconnected networks functioning in synchronism, which is the usual condition.	UCTE, *Statistical Yearbook 1998* (Terminology paragraph 4.10)
Transit of electricity	A transaction for the transport of electricity under the following conditions: (a) transmission is carried out by the entity or entities responsible in each Member State for a high-voltage electricity grid, with the exception of distribution grids, in a Member State's territory which contributes to the efficient operation of European high-voltage interconnections; (b) the grid of origin or final destination is situated in the Community; (c) the transport involves the crossing of one intra-Community frontier at least.	Directive 90/547/EEC on the transit of electricity through transmission grids
Transit of energy materials and products	(i) The carriage through the *Area* of a *Contracting Party*, or to or from port facilities in its *Area* for loading or unloading, of Energy Materials and Products originating in the Area of another state and destined for the *Area* of a third state, so long as either the other state or the third state is a *Contracting Party*; or (ii) the carriage through the *Area* of a *Contracting Party* of Energy materials and Products originating in the *Area* of another *Contracting Party* and destined for the *Area* of that other *Contracting Party*, unless the two *Contracting Parties* concerned decide otherwise and record their decision by a joint entry in Annex N of the Energy Charter Treaty.	Energy Charter Treaty (Article 7, paragraph 10)
Contracting Party	A state or *Regional Economic Integration Organization* which has consented to be bound by the Energy Charter Treaty and for which the Treaty is in force.	Energy Charter Treaty (Article 1, paragraph 2)
Area	With respect to a state that is a *Contracting Party*: (a) the territory under its sovereignty, it being understood that territory includes land, internal waters and the territorial sea; and (b) subject to and in accordance with the international law of the sea: the sea, sea-bed and its subsoil with regard to which that *Contracting Party* exercises sovereign rights and jurisdiction. With respect to a *Regional Economic Integration Organization* which is a *Contracting Party*: the Areas of the	Energy Charter Treaty (Article 1, paragraph 10)

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Term	Definition	Source of definition
	member states of such Organization, under the provisions contained in the agreement establishing that Organization.	
Regional Economic Integration Organization	An organization constituted by states to which they have transferred competence over certain matters a number of which are governed by the Energy Charter Treaty, including the authority to take decisions binding on them in respect of those matters.	Energy Charter Treaty (Article 1, paragraph 3)

Additional definitions may be found in UCTE, *Statistical Yearbook 1998* (Terminology).

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Appendix C: Countries in Central and Eastern Europe and Eurasia

Country	Neighbor countries	EU accession status	Located on the eastern border of EU today	Border of EU after 1st & 2nd tier accession	Memberships	Regional Energy Regulatory Program	Export Import Working Group
Northern Europe region							
Czech Republic	**Germany**, Poland, Slovak R., **Austria**	1st tier	Yes	No	UCTE, Centrel, CDO	Observer	No
Estonia	*Russia,* Latvia	1st tier	No	Yes	DC Baltija	Yes	Yes
Hungary	Slovak R., *Ukraine,* Romania, *F.R.Yugoslavia, Croatia,* Slovenia, **Austria**	1st tier	Yes	Yes	UCTE, Centrel, CDO	Yes	Yes
Latvia	Estonia, *Russia, Belarus,* Lithuania	2nd tier	No	Yes	DC Baltija	Yes	Yes
Lithuania	Latvia, *Belarus,* Poland, *Russia*	2nd tier	No	Yes	DC Baltija	Yes	Yes
Poland	*Russia,* Lithuania, *Belarus, Ukraine,* Slovak R., Czech R., **Germany**	1st tier	Yes	Yes	UCTE, Centrel, CDO	Yes	No
Slovak Republic	Poland, *Ukraine,* Hungary, **Austria**, Czech R.	2nd tier	Yes	Yes	UCTE, Centrel	Observer	***No***

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Appendix C: Countries in Central and Eastern Europe and Eurasia

Country	Neighbor countries	EU accession status	Located on the eastern border of EU today	Border of EU after 1st & 2nd tier accession	Memberships	Regional Energy Regulatory Program	Export Import Working Group
Southern Europe region							
Albania	*F.R. Yugoslavia, F.Y.R. Macedonia,* **Greece**	Not an applicant	Yes	Yes	Thessaloniki REM	Observer	Yes
Bosnia-Herzegovina	*Croatia, F.R. Yugoslavia*	Not an applicant	No	No	Thessaloniki REM, UCTE	No	No
Bulgaria	Romania, *Turkey,* **Greece**, *F.Y.R. Macedonia, F.R. Yugoslavia*	2nd tier	Yes	Yes	Thessaloniki REM, CDO	Yes	Yes
Croatia	Hungary, *F.R. Yugoslavia, Bosnia,* Slovenia	Not an applicant	No	Yes	UCTE	No	No
FYR Macedonia	Bulgaria, **Greece**, *Albania, F.R. Yugoslavia*	Not an applicant	Yes	Yes	Thessaloniki REM, UCTE	Observer	No
Romania	*Ukraine, Moldova,* Bulgaria, *F.R. Yugoslavia,* Hungary	2nd tier	No	Yes	Thessaloniki REM, CDO	Yes	Yes
Federal Republic of Yugoslavia	Hungary, Romania, Bulgaria, *F.Y.R. Macedonia, Albania, Bosnia, Croatia*	Not an applicant	No	Yes	UCTE	No	No
Slovenia	**Austria**, Hungary, *Croatia,* **Italy**	1st tier	Yes	Yes	UCTE	No	No

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Appendix C: Countries in Central and Eastern Europe and Eurasia

Country	Neighbor countries	EU accession status	Located on the eastern border of EU today	Border of EU after 1st & 2nd tier accession	Memberships	Regional Energy Regulatory Program	Export Import Working Group
Turkey	**Greece**, Bulgaria, *Georgia, Armenia, Iran, Iraq, Syria*	Applicant, not invited	Yes	Yes		No	No
Eurasia interconnection							
Belarus	*Russia, Ukraine,* Poland, Lithuania, Latvia	None	No	Yes		No	No
Kazakhstan /North	*Russia*	None	No	No		Yes	Yes
Moldova	*Ukraine,* Romania	None	No	Yes		Yes	Yes
Russia	*China, Mongolia, Kazakhstan, Ukraine, Belarus,* Latvia, Estonia, **Finland, Norway**	None	Yes	Yes	CDO	Yes	Yes
Ukraine	*Belarus, Russia,* Romania, *Moldova,* Hungary, Slovak R., Poland	None	No	Yes	CDO	Yes	Yes
Caucasus interconnection							
Armenia	*Georgia, Azerbaijan, Iran, Turkey*	None	No	No		Yes	Yes

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Appendix C: Countries in Central and Eastern Europe and Eurasia

Country	Neighbor countries	EU accession status	Located on the eastern border of EU today	Border of EU after 1st & 2nd tier accession	Memberships	Regional Energy Regulatory Program	Export Import Working Group
Azerbaijan	*Russia, Iran, Armenia, Georgia*	None	No	No		No	No
Georgia	*Russia, Azerbaijan, Armenia, Turkey*	None	No	No		Yes	Yes
Iran	*Turkmenistan, Afghanistan, Pakistan, Iraq, Turkey, Armenia, Azerbaijan*	None	No	No		No	No
Central Asia interconnection							
Kazakhstan /South	*China, Kyrgyzstan, Uzbekistan*	None	No	No	DC Energija	Yes	Yes
Kyrgyzstan	*Kazakhstan, China, Tajikistan, Uzbekistan*	None	No	No	DC Energija	Yes	No
Tajikistan	*Kyrgyzstan, China, Afghanistan, Uzbekistan*	None	No	No	DC Energija	No	No
Turkmenistan	*Uzbekistan, Tajikistan, Afghanistan, Iran*	None	No	No	DC Energija	No	No
Uzbekistan	*Kazakhstan, Kyrgyzstan, Tajikistan, Afghanistan, Turkmenistan*	None	No	No	DC Energija	No	No

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Appendix C: Countries in Central and Eastern Europe and Eurasia

Country	Neighbor countries	EU accession status	Located on the eastern border of EU today	Border of EU after 1st & 2nd tier accession	Memberships	Regional Energy Regulatory Program	Export Import Working Group
EU accession countries that are islands							
Cyprus		1st tier	No	No		No	No
Malta		2nd tier	No	No		No	No

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APPENDIX D

Information About the Energy Charter Treaty:

List of Signatories and Status of Ratification

The table on the following page is an excerpt of the Energy Charter Treaty and Related Documents (at page 130). The tables on Status of Ratification were downloaded directly from **http://www.encharter.org** "Latest news and background."

The full text of the Energy Charter Treaty and Related Documents can be obtained from **http://www.encharter.org** by selecting "Full text of official documents adopted by the Energy Charter Conference" and then "Download the Treaty (Zipped Word version)."

The texts or excerpts of the Energy Charter Treaty and Related Documents may be copied freely or used as part of reports, contracts, descriptions of the Treaty and similar documents, provided reference is made that the material used is "an excerpt of the Energy Charter Treaty and Related Documents" published by:

The Energy Charter Secretariat
Boulevard de la Woluwe, 56
B-1200 Brussels
Belgium

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SIGNATORIES TO THE EUROPEAN ENERGY CHARTER AS OF 1st OCTOBER 1996

	FA	*ECT*	*P*		*FA*	*ECT*	*P*
The Republic of Albania	●	●	▲	The Republic of Kyrgyzstan	●	●	●
The Republic of Armenia	●	●	●	The Republic of Latvia	●	●	●
Australia	●	●	●	The Principality of Liechtenstein	●	●	●
The Republic of Austria	●	●	●	The Republic of Lithuania	●	▲	▲
The Azerbaijani Republic	●	●	●	The Grand Duchy of Luxembourg	●	●	●
The Kingdom of Belgium	●	●	●	The Former Yug. Republic of Macedonia	✔	✔	✔
The Republic of Belarus	●	●	●	The Republic of Malta	●	●	●
The Republic of Bosnia-Herzegovina	▲	▲	▲	The Republic of Moldova	●	●	●
The Republic of Bulgaria	●	●	●	The Kingdom of the Netherlands	●	●	●
Canada	×	×	×	The Kingdom of Norway	●	▲	▲
The Republic of Croatia	●	●	●	The Republic of Poland	●	●	●
The Republic of Cyprus	●	●	●	The Portuguese Republic	●	●	●
The Czech Republic	●	▲	▲	Romania	●	●	▲
The Kingdom of Denmark	●	●	●	The Russian Federation	●	●	●
The Republic of Estonia	●	●	●	The Slovak Republic	●	●	●
The European Communities	●	●	●	The Republic of Slovenia	●	●	●
The Republic of Finland	●	●	●	The Kingdom of Spain	●	●	●
The French Republic	●	●	●	The Kingdom of Sweden	●	●	●
The Republic of Georgia	●	●	●	The Swiss Confederation	●	●	●
The Federal Republic of Germany	●	●	●	The Republic of Tajikistan	●	●	●
The Hellenic Republic	●	●	●	The Republic of Turkey	●	●	●
The Republic of Hungary	●	▲	▲	Turkmenistan	▲	▲	▲
The Republic of Iceland	●	●	●	Ukraine	●	●	●
Ireland	●	●	●	The United Kingdom of Great Britain and Northern Ireland	●	●	●
The Italian Republic	●	●	●				
Japan	●	▲	▲	The United States of America	×	×	×
The Republic of Kazakhstan	●	●	●	The Republic of Uzbekistan	▲	▲	▲

Notes

FA: *Final Act of the European Energy Charter Conference*

ECT: *Energy Charter Treaty*

P: *Energy Charter Protocol on Energy Efficiency and Related Environmental Aspects*

● signed at the Lisbon Signature Ceremony on 17 December 1994

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▲ signed in accordance with Article 38 of the Energy Charter Treaty or Article 14 of the Energy Charter Protocol on Energy Efficiency and Related Environmental Aspects (i.e. from 17 December 1994 to 16 June 1995)

× did not sign

✔ in the process of acceding

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STATUS OF RATIFICATION

Contracting Parties to the Energy Charter Treaty (dates of Treaty's entry into force) as of 12 May 2000

16.04.1998	Austria
	Azerbaijan
	Bulgaria
	Croatia
	Cyprus
	Czech Republic
	Denmark
	European Communities
	Finland
	Georgia
	Germany
	Greece
	Italy
	Kazakhstan
	Kyrgyzstan
	Latvia
	Liechstenstein
	Luxemburg
	Moldova
	Netherlans
	Portugal
	Romania
	Slovakia
	Slovenia
	Spain
	Sweden
	Switzerland
	Tajikistan
	Turkmenistan
	United Kingdom
	Uzbekistan
19.04.1998	Armenia
13.05.1998	Albania
25.06.1998	The Former Yugoslav Republic of Macedonia
07.07.1998	Hungary
02.08.1998	Estonia
06.08.1998	Belgium
13.12.1998	Lithuania
27.01.1999	Ukraine

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14.07.1999	Ireland
27.12.1999	France
17.02.2000	Mongolia

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STATUS OF RATIFICATION

Status of ratification of the Energy Charter Treaty, 26 July 2000

I. Energy Charter Signatories which have deposited instruments of ratification/accession of the Treaty with the Depositary:

1	12.07.1995	Georgia
2	16.10.1995	Slovakia
3	15.01.1996	Latvia
4	12.03.1996	Uzbekistan
5	17.06.1996	Czech Republic
6	22.06.1996	Moldova
7	06.08.1996	Kazakhstan
8	19.09.1996	Switzerland
9	15.11.1996	Bulgaria
10	25.06.1997	Tajikistan
11	07.07.1997	Kyrgyzstan
12	17.07.1997	Turkmenistan
13	12.08.1997	Romania
14	04.09.1997	Greece
15	10.09.1997	Slovenia
16	27.11.1997	Luxemburg
17	09.12.1997	Croatia
18	12.12.1997	Liechtenstein
19	16.12.1997	Austria
20	16.12.1997	Denmark
21	16.12.1997	Finland
22	16.12.1997	Germany
23	16.12.1997	Italy
24	16.12.1997	Netherlands
25	16.12.1997	Portugal
26	16.12.1997	Spain
27	16.12.1997	Sweden
28	16.12.1997	United Kingdom
	16.12.1997	European Communities
29	23.12.1997	Azerbaijan
30	16.01.1998	Cyprus
31	19.01.1998	Armenia
32	12.02.1998	Albania
33	27.03.1998	The Former Yugoslav Republic of Macedonia
34	08.04.1998	Hungary
35	04.05.1998	Estonia
36	08.05.1998	Belgium
37	14.09.1998	Lithuania

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38	29.10.1998	Ukraine
39	15.04.1999	Ireland
40	28.09.1999	France
41	19.11.1999	Mongolia

STATUS OF RATIFICATION

Status of ratification of the Energy Charter Treaty, 26 July 2000

II. Charter Signatories which have not yet deposited instruments of ratification/accession of the Treaty with the Depositary:

a. and the Parliaments of which have approved ratification of the Treaty

42 Turkey
43 Bosnia And Herzegovina*
44 Poland

b. and the Parliaments of which have not approved ratification of the Treaty

45 Australia
46 Belarus*
47 Iceland
48 Japan
49 Malta
50 Norway
51 Russian Federation*

* apply the Treaty provisionally

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APPENDIX E

CURRENT CONDITIONS OF REGIONAL ELECTRICITY TRADE

E.1 International organizations involved in electricity trade

The following five international organizations are involved in developing the legal and regulatory frameworks for electricity export, import, and transit in Central Europe and Eurasia:

- *Energy Charter Conference*, which implements a treaty signed by 51 countries including all of Europe and Eurasia but. A Chinese translation has been issued to help China to consider signing the Treaty.[1] Although the Treaty deals with energy in a very general way and is not focused on electricity, disputes concerning electricity transit should be resolved according to the terms of the Treaty. The Energy Charter Conference has the legal authority to write regulations such as *Rules Concerning the Conduct of Conciliation of Transit Disputes*.[2] Twelve countries, including the United States, have an Observer status.

- *European Commission*, Directorate B (Transeuropean Networks, Energy & Transport or DG TREN) and the Council of the European Union. With regard to electricity trade the EU's principal focus is the implementation of Directive 96/92/EC concerning common rules for the internal market in electricity,[3] but the EU is also interested in facilitating development of electricity networks and implementing Directive 90/547/EEC on transit.[4] Every member country must follow Directives and similar regulations, and therefore the accession candidates must get ready to follow the Directive.

- *European Electricity Regulation Forum*, which was initiated by the European Commission but involves the EU independent regulatory bodies, EU member states, national ministries, transmission system operators, market operators and traders, and industry organizations such as Eurelectric and consumers' organizations. Representatives of the European Commission in coordination with the independent regulatory bodies and member states of EU take part in

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[1] Mongolia, Japan and Australia are signatories but China and India are not signatories. The home page is http://www.encharter.org . Documents are available in English and Russian.

[2] These rules are published at http://www.encharter.org/English/General/conciliation/Rules.html but you must go to the home page before you can reach this web site.

[3] The home page is http://www.europa.eu.int/comm/energy/en/elec_single_market/index_en.html . Most documents are available in English, German, or French. The home page of the European Commission is in Spanish, Danish, German, Greek, English, French, Italian, Dutch, Portuguese, Finnish, and Swedish.

[4] The home page is http://www.europa.eu.int/comm/energy/en/tn_2_en.html . The electricity transit Directive is published in European Commission, *Energy in Europe: Compendium of Legislation and Other Instruments Relating to Energy* (Special Issue, February 1995), pages 344-346.

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drafting the decisions of the Electricity Regulation Forum.[5] Moreover, the decisions taken by the Forum are supported by decisions of the Council of the European Union.[6] The result is that the Forum looks like a discussion group and acts like a regulator. It regulates cross-border transactions including export and import between EU countries and non-EU countries.

- *Council of European Energy Regulators,* which has been established very recently. It provides a forum for the national regulators of EU member countries to exchange information and experience to discuss policy issues.

- *European Transmission System Operators*, which represents the TSOs of the 15 member countries of the European Union.[7] ETSO is the official source of information on Net Transfer Capacity for cross-border transactions including export and import between EU countries and non-EU countries. ETSO gives advice to the European Electricity Regulation Forum and participates in the Forum. ETSO is governed by a Steering Committee with representatives of the 15 countries and by a Council with representatives of UCTE, Nordel, the United Kingdom TSO Association (UKTSOA) and the Association of TSOs in Ireland (ATSOI).

- *Union for the Co-ordination and Electricity Transmission* (UCTE), which represents the TSOs of a group of European countries that operate synchronously.[8] UCTE establishes technical standards for synchronous operation. It does not regulate export, import or transit but it collects and publishes statistics on import and export. A TSO on the border of UCTE may request permission to operate synchronously in parallel with UCTE; after parallel operation is established, the TSO may submit an application to become a member of UCTE. EU membership is not required.[9]

From the perspective of a country wishing to become a member of the EU, these organizations are already developing the legal and regulatory framework that will be applied to the accession countries. From the perspective of a country that has not applied for EU accession, practically speaking the EU is creating a regulatory framework that my be useful to non-EU countries.

From the perspective of countries which have not applied for accession such as Russia, Belarus, Ukraine, Moldova, and others, there are major technical and financial obstacles to synchronous

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[5] The most recent decision is entitled "Conclusions: Fifth Meeting of the European Electricity Regulation Forum, Florence, 30-31 March 2000." Download from the Florence process web site: http://www.europa.eu.int/comm/energy/en/elec_single_market/florence/index_en.html

[6] See "Council Conclusions: Internal Electricity and Gas Markets," May 2000. Download from the Florence process web site.

[7] The home page is http://www.etso-net.org . Documents at this site are available only in English.

[8] The home page is http://www.ucte.org . Most documents are available in English, German, and French.

[9] Since 1997 the UCTE zone of synchronous operation has included Morocco, Algeria and Tunisia (forming part of the COMELEC network). See UCPTE *Annual Report 1998*, page 41.

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operation between Europe and them. The accession countries which theoretically will be conducting cross-border trade with Russia, Belarus, Ukraine and Moldova according to European Electricity Regulation Forum rules or ETSO rules are not members of the EU, and therefore they have not been asked to discuss the application of EU laws and regulations to the "future EU border." The regulatory framework for trade between EU accession candidates and their non-EU neighbors has not been defined. There is no Electricity Treaty between the EU and Eurasia, although high-voltage power lines are already located along the national borders which someday may become the border of the EU. The operation of these interconnections will require cooperation between the TSOs on the European side and TSOs in non-accession countries.

E.2 Energy Regulators Regional Association (ERRA)

In December 2000, fifteen Energy Regulators from Central/Eastern Europe and Eurasia plan to formally establish a regional association. The purpose of the Association is to:

(i) improve national energy regulation in member countries (including enhancing regulatory methods and practices);

(ii) foster development of stable Energy Regulators with autonomy and authority;

(iii) improve cooperation among Energy Regulators.

The objectives of the Association are to increase communication, and the exchange of information, research and experience among Members, and increase access to energy regulatory information and experience around the world and promote opportunities for training. The formal establishment process follows an agreement in December 1999 by fourteen Energy Regulators from the region to develop an association. The regulators have pursued this process with the support of the U.S. Agency for International Development and the U.S. National Association of Regulatory Utility Commissioners. The Founding Members are:

Electricity Regulatory Authority of the Republic of Albania
Energy Commission of the Republic of Armenia
State Energy Regulatory Commission of the Republic of Bulgaria
Energy Market Inspectorate of the Republic of Estonia
Georgian National Energy Regulatory Commission
Hungarian Energy Office
Agency of the Republic of Kazakhstan for Natural Monopoly Regulation, Competition Protection and Small Business Support
State Energy Agency under the Government of the Kyrgyz Republic
Energy Regulation Council of the Republic of Latvia
National Control Commission for Prices and Energy of the Republic of Lithuania
National Energy Regulatory Agency of the Republic of Moldova
Energy Regulatory Authority of the Republic of Poland
Romanian Electricity and Heat Regulatory Authority
Federal Energy Commission of Russian Federation
National Electricity Regulatory Commission of Ukraine.

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The ERRA may engage regulators in the following types of activities: Annual Conference; Standing Committee meetings and development of issues papers, analyses and publications; regulatory study tours; newsletter; website and Internet communications; technical conferences (for non-regulators); and other matters which advance the objectives of the Association.

E.3 Organizations promoting co-operation between Europe and Eurasia

There are two key organizations that sponsor conferences and issue technical reports regarding the electricity market in Europe and Eurasia. They are not regulators and they have no legal authority, but they promote co-operation between Europe and Eurasia:

- *CDO*, which is similar to UCTE but does not operate synchronous interconnections.[10] The members of CDO are Russia, Ukraine, Romania, Bulgaria, Poland, Hungary, Czech Republic and a German company, Vereinigte Energiewerke AG (VEAG) which is the TSO in eastern Germany. CDO is an open international organization prepared to co-operate with TSOs interested in parallel operation.

- *Eurelectric*, an industry association whose full members include the TSOs of western European countries plus Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia.[11] The European affiliate members include TSOs in Albania, Bosnia-Herzegovina, Croatia, FYR Macedonia, and Russian Federation. Additional TSOs can be invited to become affiliate members.

These organizations support the creation of competitive regional and international markets.

E.4 Different visions of the electricity market

Some people perceive a conflict between the vision of the EU Electricity Directive and the vision of the Energy Charter Treaty.[12]

- The basic concept of the Electricity Directive is that EU member countries must be separated from non-members, and the EU must establish an internal market which is open to EU members only. The legal foundation of the Electricity Directive is the Treaty of Rome, which established the European Community. Trade with non-members is restricted. In effect

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[10] The home page is http://www.cdo.org . Documents are available in English and Russian.

[11] The home page is http://www.eurelectric.org . Documents at this site are available only in English.

[12] At the Euroelectric conference in Brussels, 20 January 2000, energy sector lawyer Leigh Hancher argued that the EU's "reciprocity" requirements are a violation of GATT Rules and a violation of Energy Charter Treaty provisions. Representing the European Commission, Karl Falkenberg argued that the EU has a right to insist on reciprocity and the GATT Rules and Energy Charter Treaty do not take away this right. See the Eurelectric press release, *Cross-Border Trade in Electricity: Speakers Signal the Importance of Reciprocal Market Access*, download file name *2000-030-035-1.pdf* .

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the European Parliament and the Council of the European Union said in December 1996, "Since we have already agreed to define the European Union as an area without internal frontiers in which the free movement of goods, persons, services and capital is ensured, we have written the Electricity Directive to remove barriers to electricity trade within this area."[13]

- The basic concept of the Energy Charter Treaty is that energy sector trade is beneficial to all of the countries in Europe and Eurasia, but a treaty is needed to establish a common legal framework that will promote investment in the energy sectors of the economies in transition. The countries signed the Treaty on 17 December 1994 because they were "wishing to implement the basic concept of the European Energy Charter initiative which is to catalyze economic growth by means of measures to liberalize investment and trade in energy."[14] All countries in Europe and Eurasia were invited to sign (see Appendix D).

What is actually happening in Europe is that electricity markets are expanding across national borders and investors are beginning to find similar "rules of the game" both inside and outside the EU. Inside the EU, most Members have decided that TSOs should publish transmission and distribution service ("use of network") tariffs, and that tenders are not necessary to determine which generating companies should receive permits to build new power stations.[15]

Congestion management is the set of actions needed to cope with shortages of Available Transmission Capacity.[16] When there is not enough cross border transmission capacity to implement all of the buy-sell transactions desired by electricity market participants, some kind of rationing or some form of price control may be needed temporarily. Through the European Electricity Regulation Forum, all EU members are seeking a common set of rules for cross-border transmission tariffs and for congestion management. However, the electricity industry does not want to put a "wall" around the EU and restrict electricity trade with non-EU countries. Norway and Switzerland are participating in the electricity market despite the fact that they are outside the EU.

An example of an industry viewpoint is the following vision statement, which was submitted to the European Electricity Regulation Forum in November 99 by the European Federation of Energy Traders (EFET):

> Future Vision of a common European electricity transmission and trading market. A common vision, shared among market participants, transmission system operators (TSOs) and regulatory authorities about the long term possibilities to transport and trade

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[13] This is not the exact wording, of course. See the first two pages of Directive 96/92/EC concerning common rules for the internal market in Electricity.

[14] This exact wording appears in the Preamble of the Energy Charter Treaty, on the first page.

[15] See "Implementation of the Internal Electricity Market Directive in the EU Member States," available from http://www.eurelectric.org . The 9 March 2000 draft will be updated with a new draft.

[16] See Appendix B for a definition of Available Transmission Capacity.

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> electricity is a necessity, if a smooth process of market development is to transpire. The ultimate vision is of transparent and liquid markets in electricity as a commodity throughout Europe, facilitated through trading unimpeded by national borders or other boundaries. The future European integrated transmission network would then allow transportation of electricity independently of network ownership, local temporary congestion problems or country differences in culture or attitudes. The rules for operation of networks and markets would be clear and simple, yet at the same time designed to stimulate the development of one - or several integrated - marketplaces.[17]

This "vision" does not include a definition of the geographic boundary of Europe. Recognizing that "the extension of synchronous operation might also contribute to the opening up of new markets for all the undertakings concerned," the UCTE decided in 1998 to continue to invite TSOs to be interconnected with the UCTE grid, without defining any border or limit to UCTE expansion:

> The UCPTE should also be open to any form of cooperation, in terms of system operation and the exchange of experience with third parties. To this end, the principle of reciprocity should be applied. In particular, any undertakings who have applied for the synchronization of their networks or UCPTE membership should facilitate and support analyses for the extension of the zone of synchronous operation beyond their own network.[18]

Therefore the European electricity industry is beginning to support the basic concept of the Energy Charter Treaty. The electricity industry favors a step-by-step process of eastward expansion of the marketplace rather than a rapid expansion into Eurasia. Unfortunately, no one has developed a future vision of a common Eurasian electricity transmission and trading market.

E.5 Interconnections Among Countries

The interconnection of high-voltage electricity networks over large areas such as Central Europe is a global phenomenon which was largely realized between 1950 to 1980. In Central Europe the first interconnection transmission line was put into operation between Hungary and Czechoslovakia in 1953. The first ring interconnection of Hungary, Poland, Czechoslovakia, German Democratic Republic and the Lviv power system of Ukraine SSR was started in March 1962. Central Europe was linked with the Unified Power System of the USSR when parallel operation of the 750 kV transmission line between the Ukraine SSR and Hungary was started in 1979. This interconnected system began to be divided in the 1990s, after the reunification of Germany and the breakup of the Soviet Union.[19]

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[17] EFET, *European Electricity Trading an a Single Market in Electricity*. Final version, 9 November 99. Available at http://www.efet.org "Position Papers."

[18] UCPTE, *Annual Report 1998*, page 49. This statement is the conclusion of the report on "Extension of the UCPTE and its zone of synchronous operation – Strategic considerations."

[19] According to CDO the division into non-synchronously operated parts began at the end of 1993. See http://www.cdo.org/en/eindexd.htm "The CDO History."

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Following the collapse of the centrally planned economies, there was a sharp drop in electricity demand in 1990-92 and a general reduction of international trade in electricity. Electricity importing countries typically responded to the fall in electricity demand by reducing the level of imports, not by reducing the level of domestic power generation. For example, there was a sharp reduction in exports from Ukraine to Poland and from Ukraine to Hungary along the 750 kV lines that were designed to export power from the Soviet Union.[20] At the same time there were problems with frequency and voltage regulation which led to the breakup of interconnected power systems. Shortages of natural gas and heavy fuel oil made it difficult to regulate frequency within recommended limits. Military activity created damage to the power grids of Bosnia-Herzogovina, Federal Republic of Yugoslavia, and Croatia but there are now attempts to re-connect all of the countries in the Balkan region.

In 1999 the Central Europe and Eurasia region was divided into many parts, as follows:

- Poland, Hungary, Czech Republic, and Slovak Republic operated as a group of countries (Centrel) in parallel operation with UCTE.[21] A high standard of power system reliability was achieved in 1999. The Burshtin power station of Ukraine was connected to Poland, creating a small island inside Ukraine.

- Slovenia and Croatia operated in parallel operation with UCTE, through interconnections with Italy. A high standard of power system reliability was achieved in 1999.

- Romania, Bulgaria, FYR Macedonia, Greece, Albania, and Federal Republic of Yugoslavia operated in parallel during most of 1999.[22] Various transmission line failures (6 March 99, 13th May 99, 16 June 99) plus the Greek earthquake on 7 September 99 led to the isolation of one or more countries in the region.[23] Moreover as a result of damage to the power grid in Serbia it was not possible to isolate Romania and Bulgaria from the other countries for the purpose of testing the readiness of these two countries to connect to UCTE via Hungary. It appears that parallel operation with Hungary will permit Romania and Bulgaria to connect with other countries only when UCTE reliability standards are preserved.

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[20] According to CDO, "electricity supply from the former USSR diminished from 34 TWh in 1988 to 4 TWh, i.e. decreased 8 times." http://www.cdo.org

[21] See http://www.centrel.org

[22] Both UCTE and ETSO maps show Albania as an island system that is not operated in parallel with its neighbors. Albania's response to the Export Import Working Group questionnaire shows that this information is incorrect, and Albania actually operates in parallel with UCTE.

[23] For details see UCTE *Annual Report 1999*, pages 67-69. A free copy can be ordered from http://www.ucte.org Publications.

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- Bosnia-Herzegovina actually operated as an island system in 1999 although it was a member of UCTE.[24]

- Russia (excluding Siberia), Belarus, Estonia, Latvia, and Lithuania operated an AC interconnection and the Northwest, Center, Middle Volga, and Urals regions of Russia remained interconnected during most of the year 1999. Frequency control in the Northwest and Center regions remained within reasonable limits. Under emergency conditions the Baltics can disconnect from the main portion of Russia and most of Belarus, while maintaining a supply to Kaliningrad, but island operation was not necessary in 1999. The serious low frequency problems that existed in Russia in September-October 1998 did not develop in 1999. However, the northern Caucasus portion of Russia was disconnected from the rest of Russia and operated in parallel with Ukraine, from 1 January to 23 April and from 30 June to 8 September 99.

- The power system of Ukraine was internally divided during half of the year 1999. The northern portion of Ukraine (excluding Burshtin power station) operated in parallel with Russia, but was disconnected from the rest of Ukraine, from 1 January to 23 April and from 30 June to 8 September 99. The northern and southern portions of the Ukraine power system were unified and operated in parallel with Russia from 23 April to 30 June and from 8 September to 27 November 99. From 27 November 99 through the end of the year, the power system of Ukraine was entirely disconnected from Russia. The southern portion of Ukraine operated in parallel with Moldova during all of 1999. The Burshtin power station operated in parallel with UCTE via a connection to Poland, during all of 1999.

- Georgia, Azerbaijan, and Armenia and the northern Caucasus portion of Russia operated a very high voltage interconnection (500 kV, 330 kV, 220 kV) in 1999 but there were serious problems with frequency and voltage control in the Caucasus region at 110 kV and lower voltages. The northern Caucasus portion of Russia (normally a part of the Middle Volga interconnected power system) was disconnected from the rest of Russia and operated in parallel with Ukraine, from 1 January to 23 April and from 30 June to 8 September 99.

- Armenia maintained an interconnection with Iran in 1999.

- The power system of Kazakhstan operated separately from the unified power system of Russia in 1999. A very weak interconnection was maintained between north Kazakhstan and the southeastern part of Kazakhstan. The southeastern part operated a very high voltage interconnection in parallel with Uzbekistan, Turkmenistan, Kyrgyzstan, and Tajikistan but there were problems with frequency and voltage control in the Central Asian region at 110 kV and lower voltages.

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[24] See the map of "Interconnected AC transmission systems in Europe" in the report by Dr.-Ing. Hans-Jurgen Haubrich and Dr.-Ing. Wolfgang Fritz, *Study on Cross-Border Electricity Transmission Tariffs*, Final Report (Aachen, April 1999), page 11.
This 108 page report is available as a PDF file from the Florence process web site, which is http://www.europa.eu.int/comm/energy/en/elec_single_market/florence/index_en.html

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- The Siberia region of Russia operated as an island in 1999, because Kazakhstan did not operate in parallel with Russia. Despite the existence of a high voltage transmission interconnection linking western Siberia with the Urals, the power system of Kazakhstan operated separately from the unified power system of Russia. The Far East region of Russia has always operated as an island.

The UCTE system is the only part of western Europe with AC interconnections to Central Europe or Eurasia. Except for very small portions of Finland and Norway, along the Russian border, the Nordel system has no AC interconnection with Central Europe or Eurasia. In 1999 Russia continued to operate a DC interconnection with Finland which has been used to export energy to Finland. Moreover, Turkey is not connected with Central Europe and Eurasia. Greece has a DC connection to Italy by an undersea cable but there is no interconnection between Greece and Turkey.

Despite the difficulties of re-establishing electricity trade, six groups of countries are successfully developing electricity export, import and transit agreements:

- Poland, Hungary, Czech Republic, Slovak Republic (the Centrel group)
- Estonia, Latvia, Lithuania
- Romania, Bulgaria, FYR Macedonia, Greece, Albania, and Bosnia-Herzegovina
- Ukraine and Moldova
- Georgia, Armenia, Azerbaijan
- Kazakhstan, Uzbekistan, Turkmenistan, Kyrgyzstan, and Tajikistan.

There are proposals to construct a new 400 kV DC interconnection between Poland and Lithuania, and to restore operation of the existing 220 kV AC line between Hungary and Romania, and to strengthen the Hungary-Romania interconnection. Therefore it is possible that all of the countries invited for EU accession, from Estonia to Bulgaria, will eventually join a single European electricity market. If UCTE's expansion plans are successful, several southeastern European countries that have not been invited for EU accession talks will have the interconnections needed to support electricity trade.

The experience of 1979-1990 demonstrates that from a technical standpoint it is possible to interconnect a large number of countries. Today there are indications that the area of synchronous operation of UCTE will expand into southeastern Europe and that electricity trade will continue along the north-south line marking the western border of Russia, Belarus, Ukraine and Moldova. After accession of all of the countries that are now candidates for EU membership, this north-south line will become the eastern border of the EU. It is safe to assume that electricity trade will continue along the western border of Russia and Belarus because there already exists a ring interconnection linking Estonia, Latvia, and Lithuania with St. Petersburg and Moscow.

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E.6 Current status of the Energy Transit Protocol

The Energy Charter Conference met in Brussels on 5 June 2000 and discussed a draft Energy Transit Protocol dealing with access rights to grids as well as pipelines. This document is not available on the Internet. The gas pipeline provisions deal with sensitive issues and therefore it might take a long time to negotiate this Protocol:

> Among the key issues in the negotiations are the principle of non-discriminatory access to available transit capacity, prevention of unlawful taking of energy in transit, and transparent criteria for tariff-setting.[25]

[25] Energy Charter Conference, *Charter News*, Issue No. 4 (Summer 2000), page 1.

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Appendix F

Maps and Diagrams

The map of physical electricity exchanges in 1999 is published by UCTE and is included in the file *exchanges_e.pdf* which can be downloaded from
http://www.ucte.org/Statistik/English/Default_Stat_E.htm

The load flow diagram is published by UCTE and is included in the file *memo1999.pdf* which can be downloaded from **http://www.ucte.org/Publikationen/English/Default_Pub_E.htm**

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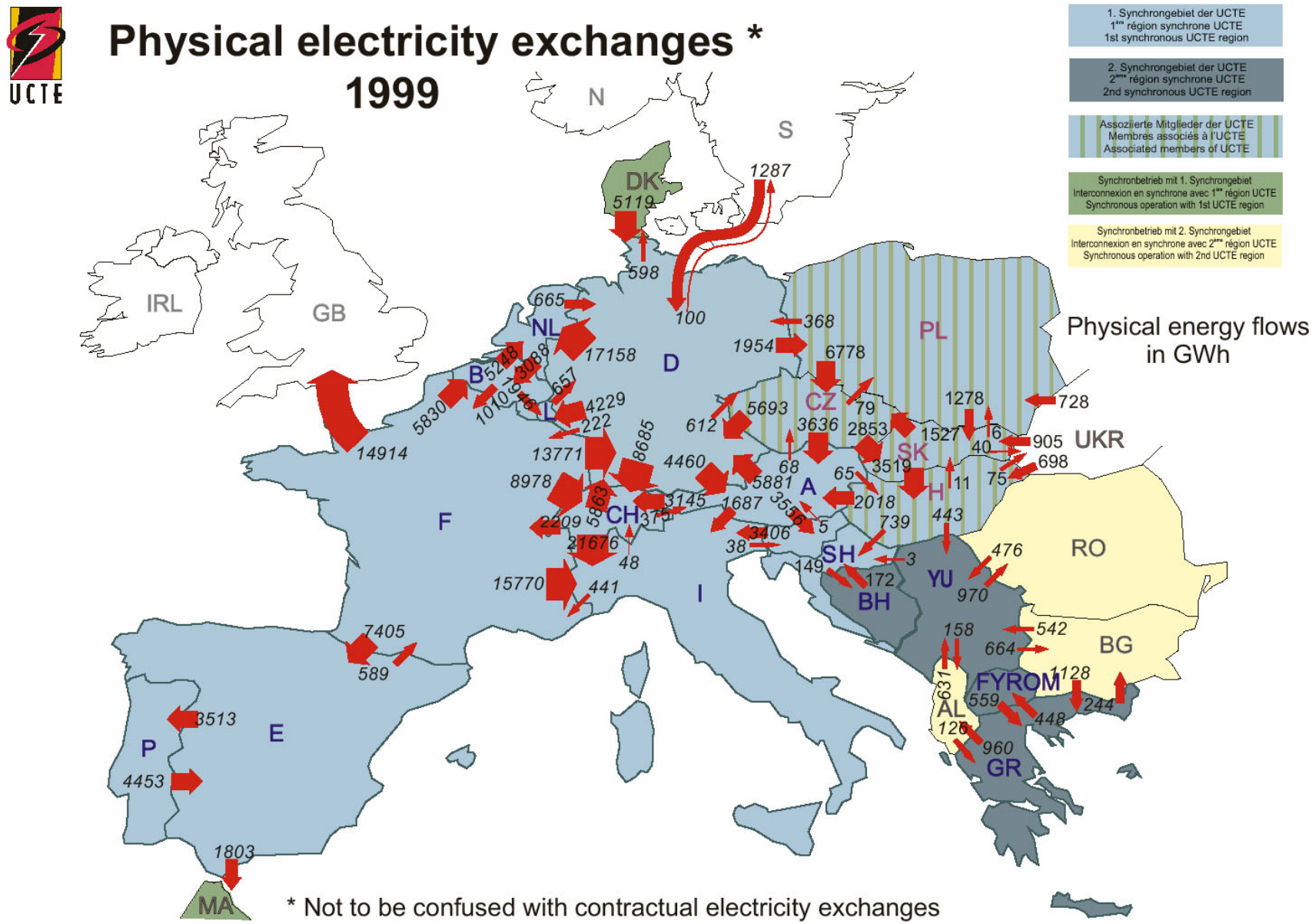

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LOAD FLOWS ON THE 3RD WEDNESDAY OF DECEMBER 1999

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1. Synchrongebiet der UCTE
1ère région synchrone UCTE
1st synchronous UCTE region

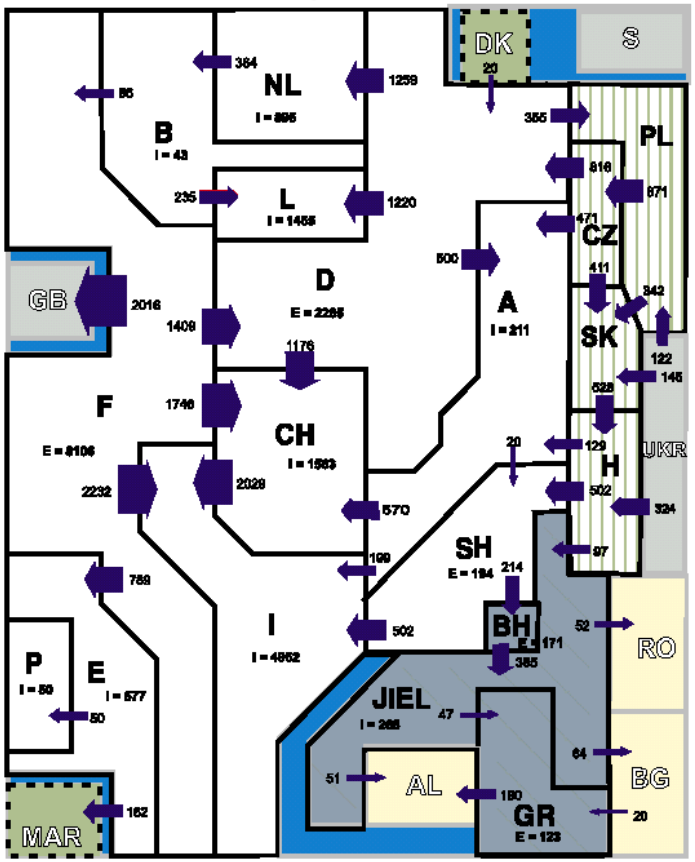
2. Synchrongebiet der UCTE
2ème région synchrone UCTE
2nd synchronous UCTE region

Assoziierte Mitglieder der UCTE
Membres associés à l'UCTE
Associated members of UCTE

Synchronbetrieb mit 1. Synchrongebiet
Interconnexion en synchrone avec 1ère région UCTE
Synchronous operation with 1st UCTE region

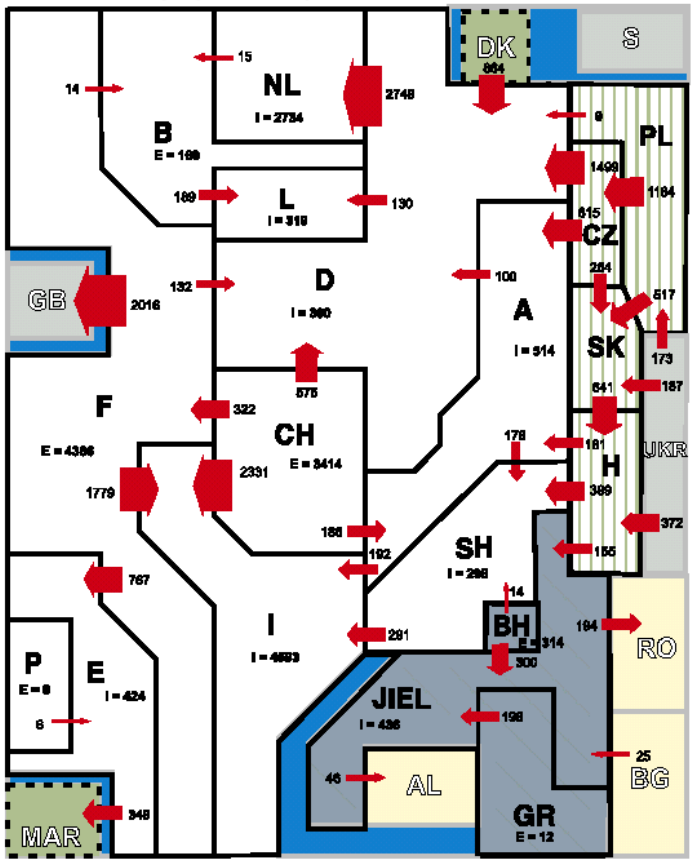
Synchronbetrieb mit 2. Synchrongebiet
Interconnexion en synchrone avec 2ème région UCTE
Synchronous operation with 2nd UCTE region

Nacht / nuit / night 15-12-1999, 3:00 [1]



Summe der Leistung des Energieflusses Somme des puissances des flux d'énergie = Sum of load flows	UCTE	UCTE+CENTREL	TOTAL
	18362	22890	26651

Tag / jour / day 15-12-1999, 11:00 [1]



Summe der Leistung des Energieflusses Somme des puissances des flux d'énergie = Sum of load flows	UCTE	UCTE+CENTREL	TOTAL
	17650	23162	27548

[1] G.M.T. + 1
I = Importsaldo - Solde importateur - Import balance
E = Exportsaldo - Solde exportateur - Export balance

Werte in
Valeurs en MW
Values in

APPENDIX G

Nordel: An Example of a Regional Organization

Source of information: www.nordel.org

Nordel is a body for co-operation between system operators in the Nordic countries. The association also serves as a forum for technical co-operation and co-ordination between system operators and actors who have technical facilities of importance for the operation and development of the electric power system.

Nordel's primary goal is to create prerequisites for, and to develop further, an efficient Nordic electricity market. Nordel gives advice and recommendations. In June 2000, the association adopted new By-Laws, which were accommodated to the new conditions that prevail on the joint Nordic market. Nordel's revised structure also makes the association well suited to represent the Nordic system in international contexts. The results of Nordel's work are public and its operations are neutral. Nordel's tasks fall mainly into the following categories:

- system development and rules for network dimensioning;
- system operation, reliability of operation and exchange of information;
- principles of pricing for network services;
- international co-operation;
- maintaining contacts with other actors, organisations and the authorities within the power sector.

Nordel's highest decision-making body is the Annual Meeting, which encompasses representatives from the Nordic system operators. The chairmanship rotates between the Nordic countries at intervals of two years. The chairman appoints Nordel's secretary and is responsible for the secretariat and for the related costs. The association has no budget.

Nordel's executive body is the Board of Nordel, is composed of one representative from each system operator in the countries of Denmark, Finland, Iceland, Norway and Sweden.The Board shall initiate discussions and make decisions on ongoing issues, and shall implement the resolutions passed at the meetings of Nordel. The Board is responsible for all Nordel's external communication activities. Much of Nordel's work is carried out by committees and working groups made up of technical specialists from the various sectors involved in co-operation within Nordel.

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The By-Laws of Nordel

Objectives and role

§1
Nordel is a body for co-operation between the system operators in Denmark, Finland, Iceland, Norway and Sweden, whose objective is to create and expand the conditions necessary for an effective and harmonised Nordic electricity market.

Nordel is also a forum for contact between the system operators and representatives of the market participants in the same countries.

The purpose of Nordel is to issue advice and recommendations promoting an efficient electric power system in the Nordic region, taking into account the conditions prevailing in each country.

Nordel seeks to further international co-operation and public relations activities pertaining to the electric power system and the electricity market.

Tasks

§2
Nordel shall contribute to technical co-ordination and to the determination of recommendations, not least in the following spheres:

- system expansion and transmission planning criteria
- system operations, reliability of operations, reliability of supply and exchange of information
- principles for pricing transmission and system services.

Further, Nordel shall maintain and develop links with organisations and the authorities, especially in the Nordic region and in the rest of Europe. In addition, Nordel shall compile and disseminate impartial information about the Nordic electric power system and about the Nordic electricity sector.

Nordel members

§3
The members of Nordel shall comprise the system operators in Denmark, Finland, Iceland, Norway and Sweden.

Meeting of Nordel

§4
The meetings of Nordel are Nordel's highest decision-making body.

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The representatives of Nordel members shall convene once a year for the meeting of Nordel (notice of which must be distributed by the Chairman) and, in addition, at extraordinary meetings as and when deemed necessary by the Chairman, or at the request of at least two members. The meeting of Nordel shall be held during the first six months of the year.

The meeting of Nordel shall:

- approve Nordel's Annual Report
- consider current business referred by committees and working groups
- consider reports on the activities of the Market Forum
- elect Nordel's Chairman and Vice-chairman
- elect the other members of Nordel's Board in accordance with nominations from Nordel members
- pass recommendations and issue statements.

Unless special reasons dictate otherwise, notice of the meeting of Nordel, to be held during the first six months of the year, shall be distributed, with the agenda, no later than one month before the meeting. Extraordinary meetings may be convened at shorter notice.

Nordel's Board may invite representatives of the market participants, the authorities, international bodies within the electricity sector, or other similar organisations to attend the meetings of Nordel. These representatives will attend as observers.

Minutes must be taken at all meetings. The minutes may be distributed freely to all interested parties in each country.

§5
Resolutions passed at meetings of Nordel should preferably be passed unanimously. Should it prove impossible to reach a unanimous agreement, the following rules for voting will apply:

- each country has one vote
- in the event of a tie, the Chairman has the casting vote.

§6
If Nordel needs to present a statement concerning an issue on which the meeting has not been able to reach agreement, the various opinions voiced by the members must be included in the statement.

Chairman, Vice-chairman and Secretary

§7
Nordel's Chairman and Vice-chairman are elected at the meeting of Nordel from among the

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representatives of Nordel members, for a term of two (2) years. The positions of Chairman and Vice-chairman shall rotate between the various countries. Nordel's Chairman and Vice-chairman perform the same functions on the Board of Nordel.

§8
In his/her own country, the Chairman of Nordel shall set up a secretariat that includes a Secretary. The Chairman is responsible for the administrative work of the secretariat and for the expenses incurred therein.

The Board of Nordel

§9
The Board of Nordel is Nordel's executive body.

The Board of Nordel is composed of one representative from each system operator in the countries of Denmark, Finland, Iceland, Norway and Sweden, appointed by the meeting of Nordel in accordance with nominations from Nordel members.

The Chairman and Vice-chairman shall be elected for a two-year term.

Nordel's Secretary also acts as Secretary to the Board.

The Board meets as and when necessary. The Chairman sends out notice of meetings.

§10
The Board shall initiate discussions and make decisions on ongoing issues, and shall implement the resolutions passed at the meetings of Nordel.

It is desirable that resolutions be passed unanimously by the members of the Board. If a unanimous decision cannot be reached, resolutions may be passed only on motions carried by a majority of the members of the Board present. In the event of a tie, the Chairman has the casting vote. Each country has one vote.

The Board is entitled to invite observers to attend meetings of Nordel, in accordance with Section 4.

The Board is responsible for all Nordel's external communication activities.

The Board shall reach agreement with the members of Nordel on the distribution of extraordinary costs between the member countries.

The Board shall also:

- consider reports on the activities of the committees
- appoint and dissolve committees, and determine the mandates of committees and working groups

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- appoint a Chairman and Secretary for each committee and working group

- appoint the members of the Market Forum after discussions with representatives of the market participants in the various countries

- determine the participants at the meeting of Nordel, to be held during the course of the first six months of the year, no later than six months before the meeting

Committees

- The maximum number of participants on each committee is ten.
- All Nordel members are entitled to participate in the work of the committees.
- The committees may have participants drawn from among the market participants and other experts.
- The committees will meet as and when required. The respective Chairmen will send out notice of meetings.

Working Groups

- The committees are entitled to appoint working groups for shorter periods, to investigate specific issues.
- In working groups reporting to one of the committees, the Chairman of the working group shall generally be elected from among the participants on the committee in question.
- The working groups may have participants drawn from among the market participants and other experts.
- The working groups will meet as and when required. The respective Chairmen will send out notice of meetings.

Liaison Group

§11
The Board shall appoint a Liaison Group to assist Nordel's Secretary and the members of the Board in their work.

The Liaison Group, which is headed by Nordel's Secretary, shall consist of one representative of each member.

The group will meet as and when required. The Secretary will send out notice of meetings.

Market Forum

§ 12

The Market Forum is a forum for the system operators in Denmark, Finland, Iceland, Norway and Sweden and for the market participants in those countries. The Market Forum is a resource body for all issues considered within Nordel. The Market Forum shall perform an advisory function within Nordel.

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The Market Forum considers matters of shared importance to the relations between the system operators and market participants in Denmark, Finland, Iceland, Norway and Sweden. Participants in the Market Forum are entitled to propose matters for consideration.

The Leader of the Market Forum must be a member of the Board of Nordel.

Up to three members from each country may participate from among the market participants. One representative from each country may participate from among the system operators.

The Board of Nordel determines which representatives are to take part in the Market Forum in accordance with nominations from and discussions with representatives of the market participants in the various countries. Representatives drawn from among the market participants must represent resources of significance for the operation and planning of the Nordic electric power system.

Participants shall be appointed for a two-year term.

Decisions taken at meetings of the Market Forum should preferably be unanimous. Should it prove impossible to reach a unanimous agreement, the differing opinions voiced must be set forth in the summary of the proceedings.

Unless there is good reason indicating otherwise in specific matters, the Market Forum should seek openness in dealing with all matters brought before it.

Publications

§13
Nordel is to publish:

- an Annual Report
- statistical information on the electricity system in the Nordic countries
- special reports on issues of relevance to co-operation within the Nordic electricity industry.

§14
Nordel's publications are usually issued in Danish, Norwegian or Swedish. The Annual Report is also issued in English.

Archives

§15
Nordel shall have a permanent archive and a working archive. Nordel's Secretary is responsible for both of these archives.

Amendments to Nordel's By-Laws

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§16
Members must receive at least one month's written notice of meetings at which possible amendments to the By-Laws are to be discussed. The agenda enclosed with the notice of meeting must include "proposed amendments to the By-Laws".

Resolutions concerning amendments to the By-Laws may be passed only if at least two thirds of all Nordel's votes are in favour of the proposed amendment

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No.	Questions	Kazakhstan	Bulgaria	Armenia	Hungary	Moldova	Georgia
1	How would you characterize your country's electricity market : vertically integrated state enterprise, vertically integrated state owned joint stock company, Single Buyer, Third Party Access (TPA) or unbundled without TPA?	Third Party Access		Single Buyer	unbundled without TPA	?	a special obligatory pool with average pricing
2	Does your system operator work independently – (ISO), or together with the transmission company (TSO - Transmission System Operator) or in the vertically integrated utility company?	TSO	TSO	ISO and separated transmission company	TSO	TSO	TSO
3	If you have Transmission System Operator, what activities does it include? (dispatching, capacity balance, export-import, transmission) Does it have any generation capacities or Single Buyer function?	No generation capacities	No generation capacities.	No generation capacities,	Own generation capacity + wholesaler function	No generation (except a 16 MW hydro)	No generation, no trading function.
4	Does your country have independent supply companies (trading companies, without distribution network), or the distribution companies provide the supply functions too?	supply and distribution together	Supply and distribution together	Supply and distribution together	distribution+ supply together	independent suppliers exist	distribution and supply together
5	Please describe the number of different legal entities with function of generation, transmission, distribution, supply.	n.a.	7 generation companies, 1 transmission company, 7 distribution companies	25 generation companies, 3 transmission companies, 6 distribution companies	12 generation companies, 1 transmission company, 6 distribution-supply companies	4 generation companies, 1 transmission company, 1 distribution company, 15 suppliers	50 generation companies, (2 of them produces 80 % of electricity) 4 transmission companies, 96 distribution companies, 4 import companies
6	Do you have eligible (qualified) consumers? From whom they are eligible to buy directly? (from generators, traders, distributors, abroad) On what basis are they eligible?	yes	No eligible consumer.	No eligible consumer.	No eligible consumer.	No eligible consumer.	There are eligible consumers. Criteria?
7	Does your country have electricity exchange or pool?	yes?	No pool.	No pool.	No pool.	No pool. (exchange system with neighbouring countries)	No pool. (exchange system with neighbouring countries)
8	Does your country have separated public service electricity supply (with transmission and distribution) and competitive market?	no separated markets	No separated markets.	No separated markets.	No separated public and competitive markets.	No separated markets.	No separated markets.
9	Please indicate on the Figure the share of private and state ownership of each box.		attached		Same as the previous one.		
	Remarks: Table describes the present situation: October 2000.						
	Advantages, opportunities	_			Number of generating units makes competition possible on the generation side.	TSO does not have generation capacity	TSO does not have generation capacity, neither trading function.
		TSO does not have generation capacity,	TSO does not have generation capacity,	Transmission company does not have generation capacity,	Unbundling is almost completed - the system operator will be indpendent from generation and wholesale in the next year	Indpendent supplyers exist	There are 4 import companies - good oppurtunity for competition
							There are eligible consumers
	Disadvantages, obstacles				New electricity market model is not yet accepted by the Parliament		
					TSO has generation capacity.		

No.	Questions	Russia	Lithuania	Kyrgyz Rep.	Romania	Ukraine
1	□ How would you characterize your country's electricity market : vertically integrated state enterprise, vertically integrated state owned joint stock company, Single Buyer, Third Party Access (TPA) or unbundled without TPA?	Vertically integrated joint stock company. (Possessing 80 % of generation, 99 % of transmission, and controlling regional utility utilities).	vertically integrated state owned joint stock company	vertically integrated state owned company	Third Party Access	Single Buyer
2	□ Does your system operator work independently – (ISO), or together with the transmission company (TSO - Transmission System Operator) or in the vertically integrated utility company?	The Central Dispatcher is owned by the vertically integrated company.	vertically integrated utility company	vertically integrated utility company	Transmission System Operator	ISO
3	□ If you have Transmission System Operator, what activities does it include? (dispatching, capacity balance, export-import, transmission) Does it have any generation capacities or Single Buyer function?	All function in one company.	all functions	all functions	No generation capacities. No trading function (except for losses)	No generating capacities
4	□ Does your country have independent supply companies (trading companies, without distribution network), or the distribution companies provide the supply functions too?	No independent supplier.	independent + public suppliers	distribution and supply together	1 supply+distribution company, 9 independent suppliers	independent suppliers + suppliers with distribution networks
5	□ Please describe the number of different legal entities with function of generation, transmission, distribution, supply.	>100 generators, high-voltage transmission line: 99% belongs to one company, 72 regional energy utilities (regional distributors), 2000 local distributors.	n.a.	1 integrated company, with 16 generation substations	9 generation companies, 1 transmission company, 3 distribution companies, 10 supply companies, 1 dispatch center	127 generators, 1 high voltage transmission company (owns interstate network too), 42 local network company, 39 suppliers with regulated tariffs. 657 supliers with non regulated tariff
6	□ Do you have eligible (qualified) consumers? From whom they are eligible to buy directly? (from generators, traders, distributors, abroad) On what basis are they eligible?	N.a.	Yes, over 20 GWh consumption	No eligible consumer.	10 eligible company, over 100 GWh consumption	No eligible consumers, however large industrial consumers can acquire delivery license, and supply energy to themselves on non-regulated prices.
7	□ Does your country have electricity exchange or pool?	No pool.	?	No Pool.	No Pool. Planned in 2004.	Obligatory pool.? (Is the price regulated, calculated or market driven?)
8	□ Does your country have separated public service electricity supply (with transmission and distribution) and competitive market?		? (Separated market should exist for eligible consumers)	No separated markets.	Separated markets	Separated regional energy suppliers for households.
9	□ Please indicate on the Figure the share of private and state ownership of each box.				attached	
	Remarks: Table describes the present situation: October 2000.	? How is the market separated? - wholesale market accounts for 35 % of produced energy. 75 % belongs to the retail market?				
	Advantages, opportunities		There are eligible consumers		TPA	
		ISO			There are eligible consumers	ISO
					Independent suppliers exist.	
					TSO does not have generation capacity, neither trading function.	Large consumers have greater freedom in energy purchase
	Disadvantages, obstacles	Vertically integrated company exists.	Vertically integrated company exists.	Vertically integrated company exists.		
			TSO has generation capacity.	TSO has generation capacity.		