

5th Annual Regional Energy Regulatory Conference for Central/Eastern Europe & Eurasia

Aspects Regarding the Development of Regional Electricity Markets

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**Licensing/Competition Committee
Regional Markets Working Group**

Regional Markets Working Group Paper: Aspects Regarding the Development of Regional Electricity Markets

Dear Colleague:

As Chairman of the Licensing/Competition Committee for the fourth consecutive year, it is my pleasure to present to you a new series of issue papers and working group papers prepared during 2001, and finalized for the 5th Annual Energy Regulatory Conference for Central/Eastern Europe and Eurasia. The Licensing/Competition Committee was set up to discuss and analyze various regulatory issues with the aim of encouraging information sharing between newly established energy regulatory commissions in the region. As one can see from our past, the Committee members have been more and more active over the years, and as a result, the Committee has produced more extensive and far-reaching working group papers.

The Committee had two meetings in 2001 and analyzed three major issues: 1. *Electricity Market Development and Market Contractual Agreements in the USA, among EU Members and in the Member Countries of ERRA* 2. *Unbundling of Electric Sector Services to Structurally Separate Monopoly and Competitive Activities*. 3. *Measuring and Assuring the Competitiveness of Energy Markets*. The novelty of these papers is that we tried to reach out of the Region and incorporate experiences of fellow regulators from the European Union and the United States. Another uniqueness of the enclosed studies is that some of the discussed aspects do not cover the current activities or experiences of many of the ERRA member regulators, thus we had to rely very much on the Committee Advisor's examples being integrated into the papers.

In addition to the issues described above, the Licensing/Competition Committee has expanded into two other key areas of regulation: Monitoring and Regional Trade. These issues have been elaborated by two Working Groups of the Committee during the year and their major findings have been summarized in issue papers: 1. *Mechanism of Monitoring/Enforcing the Licensed Activities* 2. *Regional Markets*.

I strongly believe that the Licensing/Competition Committee has become a sound and productive working team over the past years, where opinions and views are freely expressed and shared. Most of the issue papers above are the results of the dedicated work of the Committee members.

These documents would have never become reality without the continuous support of USAID, the Committee Advisor, the Commissioners and Staff Person of the United States National Association of Regulatory Utility Commissioners and some of the Regulators of EU Member countries. I truly hope that we can continue our work with the same enthusiasm and dedication in the future.

Sincerely,



Dr. Gábor Szörényi

Deputy Director, Hungarian Energy Office
and Chair of the Licensing/Competition Committee

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Regional Markets Working Group Paper: Aspects Regarding the Development of Regional Electricity Markets

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Aspects regarding the Development of Regional Electricity Markets

1. Introduction

International electricity markets are complex and experience with them is limited. Physical exchange between countries occurs anyhow where interconnections exist. But a free trade requires more complex organizational structures, coordination and settlement rules. An extensive effort is required to conjugate different national policies, regulatory and operational frameworks for a technical and commercial interconnection agreement.

Unbundling national power sectors, cooperation between transmission system operators and introducing harmonized regulatory frameworks are the major steps in breaking barriers, particularly in transmission. The terms and conditions needed to establish competitive regional electricity trade in which generators and consumers can, regardless of their locations, negotiate power and energy contracts is a difficult task. Also coordination needs much attention. Establishing common rules for regional interconnections, (technical and commercial), requires long negotiations.

2. Interconnection aspects and deregulation in the Electricity Market

The transmission system is the meeting point in the competitive market.

Countries, companies, and even complete systems all seek to interconnect for three basic reasons:

a). Savings on operating costs as a result of the structural differences of load profiles (also for exchanges of spinning reserves, even exchanges in case of excess availability at advantageous marginal costs or compensation exchanges made in kind)

b). Emergency support

c). Savings in investment (and operating) costs from complementary means of production.

UCTE (Union for Coordination of the Transmission of Electricity) saves between 3 and 10 percent overall thanks to regional interconnection. Also the exchange is designed to compensate for financial losses caused by lags between the supply and the payment for the electricity delivered. Similar savings are achieved in the United States through interconnection.

Utilities often expect and achieve considerable operational savings through their interconnections with neighboring countries. But the potential for savings on investment should not be exaggerated. Most generation companies still aim for self-sufficiency in their territories and so are committed to a certain level of investment in any case. Thus, when utilities assess the need for expanding their generating facilities and transmission networks, they seldom take systematic account of the possibilities of importing and exporting—although, increasingly, they should.

General regulatory charges for the international trade can be summarized as follows:

- Ensure the **open access** by
 - avoiding discriminatory treatment of cross-border transactions
 - allocation of limited network capacity (when this is the case)
 - avoiding opportunities for market dominance
 - Compatibility (access rules) with organized markets
- **pricing** with
 - complete recovery of network costs

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- cost reflective, in order to give efficient location economic signals (based on losses & congestions)
- incentives for **investments** by encouraging the justified investments
- Avoid non-justified barriers to trade such as:
 - pancaking
 - complexity
 - lack of transparency (opacity/confidentiality)
 - uncertainty
- Harmonized trading rules in order to avoid economic distortions
- Ensure the compatibility with well-established or regional operation & security practices and especially harmonization with the EU internal electricity market requirements
- Ensure the independence of TSOs (Transmission Systems Operators)
- Gradual implementation steps and timing (as regulatory diversity exists in most cases).

3. European Development of the Internal Electricity Market

Regarding the development of trade within the EU's internal market, it is essential that the possibilities for trade be maximized. In this context, three major actions are considered to be necessary:

- appropriate rules with respect to the pricing of cross-border transactions;
- rules for allocation and management of scarce interconnection capacity; and
- where economically justified, the increase of existing physical interconnection capacity.

All of these issues represent an essential complement to the existing electricity Directive 96/92.

At the European Electricity Regulatory Forum - Florence, held in March 2000, it was agreed to introduce a tariff system for cross-border transactions in electricity, in a first stage on a provisional 1-year basis, as follows:

- National TSOs would compensate each other for the costs incurred due to the hosting of transit flows of electricity on their network.

- The dimension of the compensation fund would be 200 MEuro, proposed by ETSO (European Transmission System Operators organization), on the basis of the available information provided by national TSOs.

- In order to define the amount of TSOs compensations and contributions, the methodology developed and proposed by ETSO to measure exports and transits would be used.

- A fee, harmonized for Continental Europe, would be charged to the exporters (generators as well as traders), proportional to the declared volume of programmed cross –border exchanges independently of the distance between generation and load.

ETSO proposal for a temporary CBT Mechanism, issued in September 2001, is included in Appendix 1.

The most important issues still addressed at the Florence Forum concern cross border transactions of electricity, in particular the tariffication of cross border electricity exchanges and especially the allocation and management of scarce interconnection capacity.

We present in Appendix 2 the Intervention of André MERLIN on the completion of the EU internal energy market, which summarizes the key issues for achieving the EU internal electricity market.

4. Regional interconnections experiences into Balkans and Baltic countries

Balkans and Baltic countries are committed to create conditions for developing sustainable technical and trading relations in the energy sector. Political will has joint the countries in several organizations such as:

- Baltic Sea Energy Task Force
- Black Sea Regional Energy Center
- Energy Charter Treaty

Diagrams of Balkan interconnected network are presented in Annex 1.

ROMANIA

In Athens on June 2nd, 2000 the ministers responsible for energy in South-Eastern Europe countries (Greece, Romania, Bulgaria, Albania, Bosnia and Herzegovina and Macedonia) signed a Memorandum of Understanding committing these countries to ensure co-ordination between initiatives relating to the establishment of a Regional Electricity Market (REM).

The Romanian transmission network consists of 400 kV, 220 kV and 110 kV lines. A 750 kV transmission line crosses the country and connects the Romanian system with the Bulgarian network and Ukraine's major power stations. The Romanian transmission network is strongly interconnected with the neighboring power systems of Bulgaria, F.R. Yugoslavia, Hungary and Ukraine. There are weaker links with Moldavia. The transmission system is connected with the corresponding transmission systems of neighboring countries as follows:

At 750 kV - Through Isaccea to Ukraine and Bulgaria (Varna).

At 400 kV

- Rosiori - Mukacevo, Ukraine
- Portile de Fier - Djerdap, Yugoslavia
- Tintareni - Kozlodui, Bulgaria
- Arad - Sandorfalva, Hungary

At 220 kV

- Isalnita - Kozlodui, Bulgaria

At 110 kV

- Stinca - Costești, Țuțora - Ungheni and Huși - Cioara, Moldavia
- Jimbolia - Kikinda, Gura Văii - Sip and Ostrovul Mare - Kusijak, Yugoslavia

The state of the transmission network is sufficiently good and it seems to be well adapted to the location and size of the existing supply and demand levels. Some strengthening to improve service (and congestions) at the northwest would be desirable. At higher demand level, the capacity of the 400 kV transformer connections would be probably biased towards the east, which is now under-utilized.

The position in the Balkans and the structure of the Romanian grid, as well as the existing interconnection facilities and their upgrading and extension, as they have been proposed and registered in the Balkan Energy Interconnection Task Force, offer the easiest and fastest to implement alternative interconnection path of the Regional Market with UCTE.

Romania, as each Balkan power system, actually regulates the load and frequency within its own control area. In order to have this mode of operation consolidated and aligned with the guidelines of UCTE, the system must have the necessary physical connection with the UCTE

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network and ensure the prerequisites for synchronous and parallel operation with UCTE. The connection must satisfy the static and dynamic stability and provide the required safety margins.

In order to ensure the synchronous interconnection with UCTE, Romania has taken the following measures:

- Carrying out the interconnection Sibiu-Mintia-Arad, Romania - Sandorfalva, Hungary at 400kV and;
- Commissioning of a second 400kV/220kV transformer in the Rosiori substation;
- Installation of 400kV, 100MVAr shunt reactors in Brasov, Rosiori and Smardan substations.

On short term is going to reinforce the system with:

- A new interconnection line between Romania and Hungary through a new 400kV line Oradea-Beckescaba;
- Operation of Rosiori-Oradea line at 400kV and the accomplishment of the 400 kV Arad-Oradea overhead line and of the 400 kV Oradea substation.

In 2000, the Transmission and System Operators - Transelectrica SA, continued the parallel operation with the second UCTE synchronous zone (Serbia, Montenegro, Macedonia, Albania, Bosnia and Herzegovina, Bulgaria and Greece) and this year started the interconnection tests with UCTE power systems.

The Romanian electricity exchanges for the year 2000 are attached in Annex 2.

HUNGARY

The negotiations with the UCTE organization started in 1990. In 1995 the Hungarian Electricity system synchronized with the UCTE system, together with the CENTREL member states.

Hungary has a strong interconnection network, consisting of 750 kV (Ukraine, out of operation), 400 kV, 220 kV and some 120 kV tie lines.

The connections are the followings:

No.	Hungarian nodal point	Foreign nodal point	Country	Voltage level (kV)	Remark
1	Albertirsa	Zahidnaukrainska	Ukraine	750	Out of operation
2	Sajószöged	Mukacsevo	Ukraine	400	Radial-connected
3	Tiszaölök	Mukacsevo	Ukraine	400	Radial-connected
4	Sándorfalva	Arad	Romania	220(400)	Island operation
5	Sándorfalva	Subotica	Yugoslavia	400	Island operation
6	Hévíz	Tumbri	Croatia	400	
7	Győr	Wien	Austria	400	
8	Győr	Neusiedel	Austria	220	
9	Győr	Gabcikovo	Slovakia	400	

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No.	Hungarian nodal point	Foreign nodal point	Country	Voltage level (kV)	Remark
10	Göd	Levice	Slovakia	400	

It seems that the international connections are strong.
There are some shorter lines on 120 kV in different directions.

The Hungarian electricity exchanges for the year 2000 are attached in Annex 3.

LITHUANIA

Interconnection of the Power Systems of Estonia, Latvia and Lithuania as a power pool (Baltic IPS) was founded after regaining complete independence of the Baltic countries in 1992. The Baltic countries cover 175,015 km² area with approx. 8 mil inhabitants (Estonia – 45,215 sq. km and 1.58 million inhabitants; Latvia – 64,600 sq. km and 2.68 million inhabitants; Lithuania – 65,200 sq. km and 3,75 million inhabitants).

Baltic IPS includes three mainly state owned power systems and operates parallel (on a synchronous AC grid) with the Unified Power System of Russia and the Power System of Byelorussia via a power loop made up of high voltage transmission lines of 330 kV, 500 kV and 750 kV of the Baltic IPS – IPS of North-West Russia – IPS of Central Russia – IPS of Byelorussia. The historically constructed grid of 330 kV dating from 1960 over the territory of the former USSR has been the reason for parallel operation of the Baltic power systems with Byelorussia and Russia.

Operative-dispatch management of the Baltic IPS within the frame of its legal competence and in accordance with the multilateral agreement on parallel operation of the power systems of the Baltic countries is carried out by the Baltic Power Systems Regional Control Center (DC Baltija) in Riga, Latvia. The terms of parallel operation with IPS of Central Russia and IPS Byelorussia are determined by multilateral agreement between RAO UPS of Russia, Concern “Belenergo” and Baltic power systems.

DC Baltija is responsible for:

- ◆ Dispatching of the entire 330 kV network in the Baltic's and with neighboring IPS of Russia and Byelorussia.
- ◆ Planning and dispatching a power balance for the Baltic power systems on a daily, weekly, monthly and annual basis.
- ◆ Ensuring reliability of the 330 kV networks under accepted criteria.
- ◆ Defining the reserve requirements and its allocation.
- ◆ Providing reactive power balance and voltage control of 330 kV networks.
- ◆ Dispatching under emergency conditions.
- ◆ Co-ordination maintenance schedules of the major generation units, transmission lines and relay protection.
- ◆ Performing 330 kV grid studies such as stability, short circuit, security and control.
- ◆ Determine the settings of relay protections and security devices of the 330 kV network.

High capacity of Lithuanian power plants, a well developed power grid infrastructure, convenient geographical location of Lithuania create good conditions to export electricity to neighboring countries, provide transit services.

Lithuanian transmission grid is a part of the Baltic countries transmission grid, which is interconnected with neighboring countries: Latvia, Belarus and Kalingrad region.

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In 2000 the export of Lietuvos energija AB amounted to 1.5 TWh, of which 0.72 TWh were exported to Belarus, 0.63 TWh – to Latvia, and 0.14 TWh – to Estonia. Compared to 1999, the electricity export dropped by 45%.

The main electricity markets are Latvia and Belarus. In 2000 Lietuvos Energija AB started to export electricity to Estonia.

Although Belarus has a high electricity demand and it cannot supply customers with electricity by its own efforts, since 1998 the electricity export to Belarus has been constrained by insolvency problems of Belarus' energy companies. Therefore, long term electricity export agreements are not signed with Belarus.

Export/Import and transit between countries are made on bilateral agreements and negotiated prices.

One of the most realistic possibilities to expand electricity market is the Lithuanian-Poland power systems interconnection project. The interconnection of power systems is an important step toward European integration, creating common European electricity market.

The interconnection of systems by constructing 400 kV line from Lithuania to Poland and Western Europe would not only provide Lithuania with the possibility to export its surplus electricity, but also create favorable conditions to participate in common European electricity market.

Toward the end of 2000 Lithuanian and Polish Governments established working groups, representing Lithuanian and Polish parties. It is expected, that in 2001 the transmission line project feasibility study will be carried out and a preliminary project implementation schedule will be prepared.

It is expected that the construction will be started in 2002-2004. The preliminary project duration is four years with its estimated value of 380-410 MEUR.

Also one should be mentioned that at the moment there is decision to make Common Baltic Electricity Market. There are regular meetings between all representatives of the Regulators and TSO's from each country on issues regarding Baltic market. Each country works mainly on their inside problems and shares with their experience. There are approximately decisions such as the different transmission tariffs in each country, no cross border tariff between countries and all trade should be based on reciprocity principle – issuing the permits for import. However there should be the cross border tariff in each Baltic State regarding electricity import from outside the area of Baltic market.

The Baltic electricity exchanges for the year 2000 are attached in Annex 4.

UKRAINE

Modern foreign policy of Ukraine with respect to the energy sector – the integration of Ukraine into the European Community (EC) on the one hand and the parallel operation of the Unified Ukrainian Power Grid with the Unified Power System of Russia on the other hand – calls for a comprehensive approach to the resolution of the many strategic problems involved, which in turn necessitates diligent critical attention when sharing experience with countries that already have experience in solving these problems, as well as with countries that are in the process of creatively exploring means and models for the development of the power industry as a whole.

The need for the continuing development of a legal and regulatory system for the power wholesale market in Ukraine must go hand in hand with its interlinking with the rules and regulations of the EC regarding foreign power markets.

At a session of the World Congress in Houston, USA, the positive experience of Ukraine in reorganizing its power sector and creating a power market was noted, as well as the role of the NERC in these processes. Today, this Commission has experience in collaborating with the regulatory commissions of Georgia, Armenia, and Kyrgyzia, as well as the commissions of other new

independent countries that have problems similar to those of the Ukrainian power industry. This experience has already exerted a positive influence on the development of regulatory statutes in the area of the local markets development. Bearing in mind the fact that the development of market is still ongoing with respect to many issues in some countries, while the process of reform is taking place in others, we feel that the sharing of experience with these nations and others is beneficial to Ukraine.

5. TSO roles regarding international exchanges - basic rules and principles

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 minimum requirements in terms of functional separation of TSOs proposed by the European Parliament and the Council is:

- those responsible for the management of the transmission system may not participate in company structures responsible, directly or indirectly, for the day-to-day running of the generation/production, and supply functions of the integrated group;
- appropriate measures must be taken to ensure that the personal interests of the management of the transmission system company are taken into account in a manner that ensures that they are capable of acting independently;
- the transmission system operator must exercise full control over all assets necessary to operate, maintain and develop the network;
- the transmission system operator must establish a compliance program, which sets out measures taken to ensure that discriminatory conduct is excluded. The program must set out the specific obligations of employees to meet this objective. It must be drawn up and its respect monitored by a compliance officer appointed by and reporting to the President/Chief Executive of the integrated company to which the transmission system operator belongs. An annual report, setting out the measures taken, must be submitted by the compliance officer to the national regulatory authority and published.

The simplest and most transparent method of preserving the independence of the TSO is to make it a separate legal entity.

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 a key role in the preparation of Market Rules. 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 are the key players in the day-to-day operation of an international electricity market. Once the rules for international exchanges of electricity are approved, it is largely up to the TSOs to implement cross-border transactions.

TSOs should play a key role in developing rules for international 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 a regional or international entity such as ETSO.
- *Network service tariffs*. A regional/international organization representing TSOs should prepare draft rules defining payments among TSOs, and submit the draft rules to a council

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representing the national regulators. The council of national regulators should draft rules for payments made by transmission network users to their TSOs. The TSOs should have an opportunity to comment on these draft rules before they are finally approved.

ROMANIA

In Romania, the System Operator works together with the Transmission Operator and forms an independent legal company CN Transelectrica SA. The Commercial Operator is also part of Transelectrica, but has separate accounts and management board.

The main activities of the System and Transmission Operators are:

The System Operator:

- Performs activities of operational planning, operative management and other specific activities at a central and territorial level. Has the obligation of performing non-discriminatory the dispatching services for all the participants to the wholesale electricity market, on contractual bases regulated by the National Electricity and Heat Regulatory Authority (ANRE)
 - Authorizes the personnel for operative command in conformity with regulations in force
 - Collects, registers, archives statistic data about NPS (National Power System) operation, as per regulations in force.
 - Provide the evidence, processing and archiving of data concerning the move of energy in NPS and data about the events of NPS, as per rules and recommendations of UCTE.
 - Coordinate the achievement, maintenance and development of an EMS/SCADA system at a national level that is to permit the monitoring and management of NPS through Dispatcher;

The Transmission Operator

- Administrates, operates , maintains, repairs, modernizes and develop:
 - a. The transmission grid (TG) (lines, equipment from the sub-stations, protection and automation systems etc.);
 - b. the pertaining installations for metering and countering the transfer of electricity through TG and at the interface with the TG users;
 - c. Information and telecommunication installations from TG, afferent to NPS;
- Provides the transmission service through TG for all the TG users according to the contracts concluded.
- Prepares:
 - a. The program for the optimal development of TG on the basis of the perspective studies;
 - b. 5 Years Perspective studies to put in evidence the constraints of the network and available capacities of TG for applications/offers for transit or imports/exports of electricity,
 - c. Programs for revisions/repairs of the transmission installations from NPS that are subject to the approval of the System Operator,
 - d. Specific study and research programs for the installations from TG
- Analyses and endorses the fulfillment of the technical conditions for the connection of the users to TG
 - Executes, modernizes, develops, verifies and maintains periodically the metering systems, in compliance with the provisions of the Regulations in force
 - Executes, operates, modernizes and develop the protection and automation systems from TG in correlation with the requests of the System Operator,

C.N. Transelectrica SA does not have generation capacities and the access to the grid is regulated. The license requirements stipulate that the Transmission Operator does not have the right to buy or sell electricity. It can buy electricity only for covering the grid losses.

HUNGARY

Preparing the new electricity law, the earlier National Control Center has been restructured. Hungarian Electricity System Operator (MAVIR) , the new organization was established in 2001.

The main tasks are the following:

1.Before the market opening

- real-time system operation, control and monitoring
- network operation control, switching commands
- electricity export-import control according to UCTE rules
- optimal dispatch of generation
- load-frequency control of power plants
- resource planning
- network operation planning
- settlement of electricity, operation analysis,
- preparation for emergency situations
- some additional tasks, like writing and maintaining the Grid Code, writing different reports and statistics

The new Electricity Act comes into effect in 2003. MAVIR will have new responsibilities.

2.After the market opening, some new tasks

- establishing and operation of balancing market
- regulation of the access to the National Grid
- congestion management
- integration and harmonization of the delivery schedules of producers
- maintaining of system reliability in market environment
- calculation and publication of available transfer capacity
- preparation and updating of the Code for Trade of Electricity
- monitoring of trading
- monitoring of transmission and cross-border prices of the free market, publication of integrated data
- tasks resulting from membership in CENTREL, UCTE, SUDEL
- control of transition processes toward the new model
- quality management, PR tasks, business, legal and administrative tasks

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The planned enforcement of the new act is 2003. By that time the ISO will have to finish the necessary transition processes.

LITHUANIA

According to the Law on Electricity in Lithuania principles of Transmission Activities is:

1. A legal person owning transmission networks, shall be a transmission system operator. It shall be responsible for operation, maintenance, management and development of the transmission system in the territory of Lithuania and its interconnections to other systems, by eliminating bottlenecks of the transmissions networks in accordance with its customers' needs.

2. The transmission system operator, following the rules for operation of power plants and electricity networks approved by the Government or a body authorized by it, the grid code and other legal acts, must ensure that conditions for the connection to the transmission system of generating installations, distribution systems, and customers' equipment are in conformity with the rules for operation of electricity networks approved by the Government or a body authorized by it and are non-discriminatory.

3. The transmission system operator shall provide, on a basis of reciprocity, to the operator of any other system sufficient information necessary to ensure safe and efficient operation, co-ordinate development and interoperability of the interconnected system.

4. The transmission system operator must ensure objective and non-discriminatory conditions for users of transmission networks.

According to the Law on Electricity in Lithuania rights and duties of the Transmission System Operator, i.e. the transmission system operator shall have the right:

1) To receive from producers, distribution system operators and eligible customers connected to the transmission networks metering data and other information necessary for carrying out the balancing function and other duties listed in this Article.

2) To obtain from the existing and potential customers of the transmission networks information necessary for third party access to the system;

3) To lay down, in accordance with the technical regulations of networks operation, the working conditions for the operation of the distribution networks, power plants and customers connected to the transmission system, which shall be necessary for safe operation of the transmission networks;

4) To buy regulating energy and reserve capacities;

The transmission system operator must:

1) Provide electricity transmission services to the users of the networks;

2) Operate, maintain, manage and develop the transmission system and interconnections to other systems;

3) Organize, install, maintain and operate the energy metering system in the transmission network;

4) Read measuring devices and pass on the meter readings to the market operator and suppliers;

5) Connect the customers' equipment, and the installations of producers and distributors to the transmission system in accordance with the requirements of technical regulations,

6) Give a motivated written reply to the existing and potential customers in the event of a refusal to provide to them the service of electricity transmission. Such a refusal must be substantiated by non-discriminatory restrictive technical criteria;.

7) Dispatch the generating capacities and energy flows in the transmission networks in the territory of Lithuania with account of exchanges of electricity with other interconnected systems;

8) Carry out the national balance function by providing uniform, non-discriminatory and competitive conditions for all electricity market participants;

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9) Carry out the reservation function by providing uniform, non-discriminatory and competitive conditions for all electricity market participants;

10) Ensure safety, reliability and efficiency of the transmission networks and the availability of all necessary ancillary services;

11) Dispatch generation capacities according to the priorities set in the last electricity sale auction or contracts;

12) Ensure efficient, reliable and safe functioning of transmission networks in the territory of Lithuania with due regard to environmental protection;

13) Ensure the confidentiality of commercially and operationally sensitive information obtained in the course of carrying out its business, except in cases provided for by law.

The market operator shall organize electricity trade and transit. He shall also regulate payments in internal and external markets in accordance with the rules of trade in electricity.

At the moment the common Grid Code for all three Baltic States is prepared by each national TSO. This Code will be the base for the technical operation among IPS.

UKRAINE

Currently, pursuant to agreements between the Energorynok State Energy Enterprise and RAO Unified Energy System of Russia, technological flows are being bought and sold within the context of parallel operation of the unified power systems of Ukraine and Russia. Technical agreements have stipulated the conditions for this parallel operation of the two power systems.

Electric power is purchased by power suppliers on the wholesale power market for the purposes of export at unregulated rates.

Management of central dispatching for the Ukraine's Unified Power System and international flows of electric power is performed by the Central Dispatch.

Electric power exported to Moldova, Hungary and Bulgaria and imported from Russia is transported along interstate high-voltage power lines.

Electric power is supplied to European states from the so-called Burshtyn Island.

Because of the low carrying capacity of the mainlines and interstate electric lines in Ukraine, transit and export of electric power through the Ukrainian power grid presents a problem.

To ensure national electrical safety the regulatory commission coordinates the terms in contracts for import and purchase of electric power for export. The terms of such contracts must be acceptable to the parties, and the economic effect of power sale and purchase and profitability of international trade must be desirable from the standpoint of Ukrainian power consumers.

One of the most important and strategic Ukrainian directions for trade relations in the power industry is Ukraine's participation in the common European power market.

To implement this project it is essential from a technical standpoint to rebuild power plants and power lines so as to ensure reliable supply of imported electric power to Ukrainian consumers and export of electric power in accordance with UCTE conditions and the competitive European market.

6. How is international trade able to favor the development of local electricity markets

1. *Generation cost savings.* Over the whole region composed of a group of countries, the development of electricity trade enables the power systems 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

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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.

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, or in a large country with a highly interconnected grid, than in a small country. The larger the number of generating stations and producers connected to the grid, the greater the chances that the consumer will benefit from a competitive electricity market. This consideration is particularly important for small countries, and countries in which generating resources are controlled by a company with monopoly power.

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 European Transmission System Operator rules 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.

We can identify some key commercial barriers, which currently reduce or eliminate the regional market development:

- Policy favoring domestic generating plant or fuels,
- Artificially low prices to key customers group,
- Tendency to limit imports regardless of economics,
- Limited ability of key customers to buy from competitive suppliers,
- Limited private ownership in the power sector,
- Financially weak utilities that are not creditworthy trading partners.

The Baltic electricity market as one is not big enough for real competition, but it could be very useful in order to reduce costs of ancillary services. All countries have very different sources of energy, what is very beneficial for optimal operation of the systems.

7. Import/export license

- Who are the potential applicants (suppliers, distributors, transmission/system operator or producers)
- Which specific rules may be imposed by regulatory bodies

ROMANIA

Romania is one of the signatories of the Energy Charter Treaty and the Energy Charter Protocol on Energy Efficiency and Related Environmental Aspects.

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The Ministry of Industry and Resources releases licenses for import/export activities taking into the consideration the legitimate interests of the Romanian State and the international commitments.

The regulatory body, ANRE, supervises Romania's foreign trade activities, in the electricity sector, within the framework of his attributions, set out methods of calculation for transmission tariffs and establishes the transit fee.

According with the voltage level of the electric energy, the agent who makes energy trade activities (supplier, producer, eligible customer) will pay the distribution tariff and/or the transmission tariff, the import taxes. Until now, there are no limited import/export quantities by the Government. The treatment of all the economic agents is non-discriminatory.

The Romanian electricity import and exports in the region were small in the year 2000 (775GWh/ 1470GWh) despite the fact that Romania has an over capacity in electricity generation. Cross-border electricity transactions are done by the national utilities (SC Termoelectrica SA, SC Hidroelectrica SA) and are based on commercial rules. To realize the trade, the agreement from TSO - CN Translectrica SA is required.

HUNGARY

According to the actual state of the Electricity Law the only possible importer now is the state owned Hungarian Power Companies Ltd (Hungarian abbreviation is: MVM). Following the single buyer model, MVM is the only player who can import and export electricity. MVM has long-term import-export agreements with different producing and trading associations.

The actual figure of the Hungarian balance in 2000 and the structure of the consumption in 2000 are attached in Annex 3.

According to the 2000-year figures the net import was 3,439 GWh.

Hungary has to face a growing problem in the field of the electricity transit: the difference between the scheduled and non-scheduled transits. In 2000 the overall volume of the non-scheduled transit was about 3,400 GWh which is close to the total net import value.

The planned future is different. The new Act makes possible to import electricity by the players who possess import license. Participants like eligible customers, operation license holders like traders, producers, etc. and the public utility wholesaler can receive import license. Starting the new act, the only restriction of the yearly import is the 50% limit of the yearly consumption of the eligible customers. The participants have to adhere all the concerning instructions, like MAVIR (ISO) instructions, Market Rules, Grid Code, etc.

Considering the new EXIM tariffs, the planned arrangements are under preparation.

LITHUANIA

According to the Law on Electricity for covering their needs, eligible customers shall have the right to conclude without restrictions electricity supply contracts with licensed producers and suppliers, located both inside the territory of the country or in other countries. The procedure, terms and rules of issuing licenses shall be approved by the Government or a body authorized by it. Producers and suppliers, while concluding supply contracts with eligible customers, shall conclude bilateral agreements with transmission and distribution system operators on their right of access to the system. Independent producers, for supply to their subsidiaries or branches located either inside the country or in another country through the interconnected system, shall conclude bilateral agreements with transmission or distribution system operators on the right of their access to the system. Eligible customers and suppliers may import electricity only subject to uniform conditions established by the Government or a body authorized by it. The Government of the Republic of Lithuania or a body authorized by it shall grant authorizations for electricity import only on condition that other countries provide equal opportunities for their eligible customers and suppliers to import

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electricity from the Republic of Lithuania, and with account of the quotas for imported energy established by the Government or a body authorized by it.

There are quite enough different companies from abroad and some inside the country wanting to proceed export from Lithuania. This may lead to the conclusion that mainly the independent suppliers will require import/export licenses.

Regulator should include all requirements in the licenses, which will be as the guarantee that participant act as the energy rules and industry codes require.

UKRAINE

In Ukraine, the relations involved in the import and export of power are regulated by the rules of common law; namely, by constitutional rules, the rules of the Civil Code of the Ukraine, the laws of the Ukraine titled “On Foreign Economic Relations”, “On the Customs Operations of the Ukrainian Soviet Socialist Republic (SSR)”, “On Foreign Investments”, and “On Transactions Involving Customer-Supplied Raw Materials in Foreign Economic Relations”, the Decrees of the Cabinet of Ministers of the Ukraine entitled “On Setting Quotas and Licensing the Exportation of Goods (Work, Services)” and “On the Liberalization of Foreign Economic Activities”, and the Power Charter Treaty ratified on 2/6/98.

The law “On the Power Industry” provides a legal foundation for the operations of a wholesale power market in Ukraine, which requires that all electric power shall be bought and sold on the Ukrainian wholesale power market; however, the importation and exportation of power is not included in this legislation. The licensing of the import/export of power isn’t addressed in the law On the Licensing of Certain Types of Business Operations either.

Thus, not a single Ukrainian law makes provisions for the licensing of the importation and exportation of power.

However, paragraph 22 of Resolution No. 2043 of the Cabinet of Ministers of Ukraine, dated 11/5/01 and entitled “On Approval of Interim Provisions for the Functioning of a Wholesale Power Market”, stipulates that imported or exported power shall be bought and sold exclusively on the wholesale market.

Prices for imported and exported power will be determined by the energy sector regulatory authority based on economic feasibility and the current prices for power in foreign markets.

Due to the implementation of market reforms in the Ukrainian power industry – that is, the transition from methods of the centralized government management of the power industry to an open market and the creation of a Ukrainian wholesale power market – a need has arisen for developing mechanisms of foreign trade under the new conditions, as well as adopting an entire complement of legislative acts that will regulate business relations in this sector, including the relations involved in the importation and exportation of power and means and methods of government regulation of import and export transactions.

8. Transit capacity usage

A cross-border transaction (CBT) is any power transaction between parties that are located in different control areas, according to:

- physical bilateral contracts
- bids of an external agent into a pool or power exchange

CBTs always result in cross-border physical flows. The transit depends on the internal & external commercial relations of the agents within the affected country.

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But cross-border physical flows also may result from the overall pattern of generation and load, even without CBTs. The use of the network of a system does not only depend on the physical flows at the border, but on the internal distribution of flows.

The Control Areas coincide with countries in most cases. Generally, each System Operator must keep the net physical flow in or out of its control area equal to the net aggregated value of scheduled inputs and outputs for the area.

The Net Transfer Capacity (NTC) and the Available Transfer Capacity (ATC) are an important basis for market participants to anticipate and plan their cross-border transactions and for the TSOs to manage these international exchanges of electricity. NTC represents the best estimate limit for physical electricity transfer between two areas. It is also the most useful information regarding transfer capacity to be published to the Market Players.

ATC is the transfer capacity remaining between two interconnected areas for further commercial activity over and above already committed uses of the transmission networks. NTC and ATC can be calculated between two countries, two regions, two power pools etc. They may be considered in a different manner depending of the structure of the transmission system concerned.

Evaluation of congestion management methods and the criteria to assess a method are presented in the following table.

	Transaction-based concept		Non-transaction-based concept		
Possible criteria	<ul style="list-style-type: none"> • first come - first served • pro-rata allocation • duration / volume of transaction • type of transaction • price (for auctioning) • draw 		<ul style="list-style-type: none"> • Market splitting • Counter trade • Re-dispatching • Cross-border coordinated re-dispatching • Combination of the above 		
Advantages	<ul style="list-style-type: none"> • Quality levels can be applied to individual transactions 		<ul style="list-style-type: none"> • Non-discriminative • No barriers for trading 		
Disadvantages	<ul style="list-style-type: none"> • very complex to handle in case of many transactions • danger of discrimination 		<ul style="list-style-type: none"> • precondition of power exchanges (such as nodal pricing, market splitting) • requires countermeasures for TSO 		
	<i>Curtailment based on published NTCs</i>	<i>Auctioning</i>	<i>Market splitting</i>	<i>Re-dispatching</i>	<i>Cross-border coordinated re-dispatching</i>
<i>Fair and non discriminatory</i>	Depends on allocation rule	Yes	Yes	Yes	Yes
<i>Economically efficient</i>	No	Yes	Yes	Yes	Yes
<i>Transparent and non ambiguous</i>	Yes	Yes	Yes	Yes	Yes
<i>Feasible</i>	Yes	Needs strong TSO coordination	Difficult (requires a spot market)	Existing practice in many countries	Needs strong TSO coordination
<i>Incentives to TSOs for enlarging NTC</i>	None	Potentially	Potentially	Potentially	Potentially

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Auctioning is still strongly used for allocation of cross border transmission capacity in Europe. In Scandinavian countries congestion management is based on market splitting.

Until now, congestion management remains the hardest subject under dispute after Florence meetings.

In Appendix 3 is presented the EU situation regarding Transit Capacity Usage.

ROMANIA

CN Transelectrica SA draw-up a procedure that ANRE agreed regarding rules applied for transit capacities. The ATC and NTC must be periodically published. There are defined five criteria for NTC allocation, the most important being: first come, first served and the impact on efficient operation of the NPS. But the congestion management is not a vital problem to resolve yet, due to decreasing demand in the last years.

HUNGARY

Because of the predictable export-import turnover the value of the Available Transfer Capacity (ATC) is a very important question for every participant of the ex-im business. However the prediction is extremely difficult knowing the non-predictable international factors such as the question of the non-scheduled transits.

The estimated future ATC in Hungary is the following:

Until ⇒	2002	2005	2010	2014
Predicted ATC in MW	620-470	870-720	1220-1070	1320-1170

The prediction is based on the below TTC values:

Relation	TTC value in MW
Hungarian -Austrian	900
Hungarian-Slovakian	900
Hungarian-Croatian	1 000
Hungarian -Ukrainian	500

The methodology of the estimation of the ATC values is the same as published above in our report. In determining the ATC values the main problem is the difficult prediction of the non-scheduled transits in Hungary. For example, even the French – Italian export has significant influence on the Hungarian grid, because of the magnitude of these transactions and the loops of the network topology.

The future allocation method of the ATC-s hasn't been developed yet. The planned governmental order is under preparation now. This law will contain the necessary prescriptions concerning the allocation method of ATC, together with the treatment of potential congestion phenomenon. Fortunately, up to now we haven't any congestion problem in Hungary. Still we are considering the application possibilities of auction methodology.

LITHUANIA

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In the initial stage, the transit capacity usage should be the matter of the rules. As it was earlier mentioned the procedures related with the transfer capacity would be regulated by the Baltic Grid Code. A working group, created by Baltic States energy companies and joint enterprise DC Baltija discusses technical issues of Baltic States electricity market implementation, creates Baltic Grid Code, which will be used to adjust technical conditions for access to network and operation of technical systems. The Chief Dispatch Service of Lietuvos energija AB participates in preparation of documents, defining interaction between dispatch centers. In order to co-ordinate a parallel operation of Baltic States energy systems, a Limited Joint Stock Company DC Baltija has been established, with its shares equally held by Lietuvos Energija AB, Latvenergo and Eesti Energia.

The Baltic region does not see any restraints towards the transit capacity for the coming future, i.e. there is not exist the congestion problem due to the markedly reduced consumption of the electricity during the last decade.

UKRAINE

Transit of power and gas in Ukraine is ensured by the obligation of transmission lines owners to grant third parties equal access to transmission lines (third party access) and is regulated by the appropriate sections of the Terms and Conditions for Engaging in Business Operations Involving the Transmission of Power and Gas. The procedure whereby third parties gain access to transmission capacities calls for the appropriate contract, payment for transmission services, which is determined by the type of transmission lines used, and payment for ancillary services such as dispatching or packaging and forwarding of information to the wholesale market.

9. Transit tariffs versus transmission tariffs: calculation rules, costs categories to be considered, risk evaluation upon system safety

Some possible rules to be implemented regarding cross border pricing can be summarized as follows:

- consistency with the costs structure of the transmission networks
- physical and financial CBT need to be separated (as pricing is a financial problem and congestion management is a physical one)
- inter-TSO payments mechanism need to be agreed
- avoid market distortions (especially upon locations)
- internalize to the consumers the CB tariff - disputable

Harmonized structures of the partners are particularly important for pricing systems. In a competitive market, only a pricing system based on bidding can be viable because it does not require the publication and verification of detailed economic information. Traditional approaches based on marginal costs, profit sharing and "avoided" costs cannot work in a competitive environment because economic information will no longer be shared or easily verified.

ROMANIA

Imports and exports of electricity are to be treated on identical basis to power that is generated or consumed in Romania.

The methodology for transmission pricing consists of the following elements:

- i) Use of nodal pricing as the basis for the prices in the wholesale market.

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- ii) A zonal pricing scheme is proposed, where the required quantities are obtained from a reduced model of the original one (based on the application of the REI-Dimo model reduction technique).
- iii) Determination of the transmission charges as the application of two components:
 - The “network component” of the nodal prices, to be applied to all consumers and generators. A small fraction (up to 20%) of the total transmission costs would be recovered in this way.
 - The remaining transmission costs will be allocated to the generators, in proportion to the benefit that they obtain in the market.

HUNGARY

According to the aforesaid prescription, the actual single buyer model assumes the direction of export, import and transit in the hand of the state owned MVM. The agreements signed by the single buyer are in accordance with the actual international practice. Earlier we mentioned the present stage of the development of the tariff questions in the new tariff Governmental Order. These prescriptions will be coherent with the well-known international practice. The planned elements are based on widely used principles like non-discriminatory, transparent way of accession of the grid at reasonable prices. Probable basic priorities are: system stability and reliability.

LITHUANIA

The transmission charge calculation is based on the ‘point-tariff’ principle. According to the Law on Electricity, the price cap of the transmission service shall be determined by the State Control Commission, for Prices and Energy for a three year period. The transmission charge consists of the profit and the expenses for transmission network maintenance, losses and its own needs. The network costs also include the expenses of the ancillary services. The transmission tariff will be differentiated by two-part tariff type; i.e. it will consist of the demand (kW) and energy (kWh) components.

In the meetings of the Baltic Regulators & TSO’s, it is mainly agreed that the customers of each Baltic State pay to their national transmission grid in case of import/export. If there are occurred the additional costs according such a trade, the TSO’s could agree on extra payments among them.

The Lithuanian transmission grid is mainly used for the transit flow, which comes from Russia to Kalingrad. At the moment the transit tariff is the matter of the negotiations among the related countries. It mainly represents the variable costs (losses) of the transmission network, because of the existence of the comparably cheap energy in Russia.

According to other countries experience, for instance Denmark, transit tariff should be calculated as ‘transit tariff = transmission tariff + cross-boarder tariff’. Cross-boarder tariff could be calculated as the average tariff inside the country minus import tariff.

UKRAINE

The transfer tariffs approved by the Ukrainian NERC for a particular licensed transmission operator are used to calculate transit rates for the transmission of power or gas on behalf of a third party. The calculation of the rates accounts for the volumes of power (gas) being transmitted, both for internal consumers and for outside consumers.

10. Conclusions

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The development of competitive electricity markets in regions with two or more countries is a new concept. 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 all over the world.

Regulators, members of ERRA from 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.

On long term, to establish the Regional Electricity Market in this area, there should agreed between countries technical, trading and financial arrangements:

1. To define, analyze and develop a Grid Code
2. To define, analyze and develop a Trade(commercial arrangement) Code
3. To define, analyze and develop Settlement Procedures
4. To establish / develop the Power Pool(s) or Power Exchange

The experience accumulated in the United States by the operating pools, ISOs (Independent System Operator) or RTOs (Regional Transmission Organization) could be used as a model for international trading arrangements. Their implementation should be based on a learning process.

A step-by-step process is the most efficient way to reach a common approach and ERRA can contribute to the following measures:

- The provision of technical and methodological assistance to projects in order to identify and transfer the best practices in areas such as methods of analysis and forecasting, means of collecting data, access to and exchanges;
- The development of links between regulators, energy industry and academic and administrative circles, in order to promote research instruments;
- The implementation of any other initiatives contributing to the dissemination of the results obtained, including publication of reports, workshops, seminars and conferences.

11. Glossary

Definitions

Ancillary services	Services that are required for the security and stability of the transmission system. These services are designed to ensure reliability of power supply to end-users.
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.
Control area	The grids that are operated by one System Operator
Cross border transactions (CBT)	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.
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 regional 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 authority / government of the country in which the TSO is located.
Open access	Any procedure approved by the authority / government of a country or a group of countries, which enables electricity producers and consumers to negotiate contracts with each other.
Pancaking of transmission costs	Added electricity transit costs for several control areas.
Settlement	The process of financial settlement for products and services purchased and sold. Each settlement involves a price and quantity.

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Trade Code	A document containing rules for the operation of an open regional 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 authorities / governments of all of the countries in which the electricity market is located. If the electricity market exists in only one country then only one regulatory body approves it.
System Operator	Operational organization which is assigned to coordinate short-term operations to maintain system stability and achieve least-cost dispatch for the Transmission System
Transmission Operator	Operational organization which is assigned to operate, plan and develop the transmission grid

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3 September 2001

ETSO proposal for a temporary CBT Mechanism

The “Conclusions of the 7th Regulators forum in Florence” (May 2001) contains in its chapter II “Cross-border tariffication”, the following paragraph 3:

“The participants of the Forum stressed that the internal market in terms of cross-border trade and competition has not yet significantly developed since the entry into force of the electricity directive. In this context, the member of the European Parliament, representatives of the Commission, the CEER, ETSO, consumers, traders and industry associations called for the introduction of the temporary tariffication mechanism agreed at the 5th meeting of the Florence Forum in March, by 1 September 2001. The Forum underlined that the detailed implementation of the system by each Member State must ensure that the mechanism facilitates trade, does not hamper the further development of the market, and – as requested by the Stockholm European Council in March 2001 with regard to the development of the internal energy market – is in compliance with the Community competition rules contained in the Treaty. In this respect, the representatives of the Commission underlined that the implementation of the provisional system must provide a clear signal, which is compatible with the objective to achieve the internal market, notably through facilitating and thus intensifying trade in electricity throughout the Community. It must also not be transaction based and fully respect the principles of non-discrimination, cost-reflective, simplicity and transparency and must lead to an undistorted internal market.”

Already for the 5th Regulators forum in Florence (March 2000), ETSO had agreed on a harmonized proposal for a CBT-mechanism that would be based on a system avoiding market-distortion, discrimination and would lead to a simple cost-reflective implementation. However, the idea of a cross-border payment on exports did not find enough support at the forum and was left to subsidiary.

As a consequence, when ETSO started the implementation of a temporary tariffication mechanism, it appeared that several TSOs in continental Europe would not be able to sign the arrangement because they were concerned about market distortions caused by the non-uniform payment schemes. With the objective to facilitate trade in Europe, ETSO has been working actively to find mechanisms that could be implemented in 2002 by all concerned TSOs.

The following proposal for a transitory mechanism to remunerate the use of national transmission systems by cross-border trade (CBT-mechanism) has taken into account, to the extent possible, the preoccupations of all TSOs as well as those of their national Regulatory authorities. It is a compromise in which concessions have been given from all TSOs in order to achieve a common and unanimous position. To be implemented, this proposal will of course need the agreement from the different national Regulatory authorities and the European Commission.

This ETSO proposal concerns only the fair remuneration for the use of national transmission networks by cross-border trade. More particularly, the proposal does not affect or grant access to national networks (rules by EU directive and national legislation) nor does it handle capacity allocation and congestion management issues for which dedicated solutions are required.

The ETSO proposal maintains the principles of an inter-TSO compensation that is a function of the transit hosted by each country as measured from the flows on the interconnections with the adjacent control blocks. The main difference concerns the funding of the ETSO-fund that combines two models “declared exports” and “Net-flow”. The proposal leaves room for subsidiary in design of details.

The ETSO proposal consist of:

1. ***A fixed compensation fund of 200 million euro for one year (2002)***: The amount of 200M€ has been maintained given its approval during the last Regulators forum in Florence. Although new cost claims would most probably provide different numbers from the TSOs, it was considered that the ETSO fund would not be less than 200 M€ and the relative share of each TSO would not be significantly different.

This compensation fund is divided in two parts. The estimation for each part is calculated ex-ante from “last-year” data defined for the first year from July 1st 2000 to June 30th 2001. The estimation for each part of the fund is required to enable each TSO calculate the impacts to national tariffs through which the contribution is collected:

- ***A first part (called “declared export”) of the fund*** is calculated by applying a payment of 1€/MWh to the estimated volume of declared exports in 2002. This estimated volume of declared export is based on the arithmetic mean between the declared exports (following UCTE rules) and the net export flows (considered as ideal netting). This method takes into account the higher volatility of contribution in the fund since:
 - the UCTE rule leading to the “declared exports” leads to an over-estimation of the real exports (e.g. one exchange of energy crossing two borders leads to the two declared exports).
 - The “net export flow” on the contrary provides an underestimation of the real exports (e.g. in this case, the declared exports always take perfectly into account all imports leading to “ideal netting”)
- ***The second part (called “net flow”) of the fund*** is defined as the remaining amount of contribution to collect so as to obtain the total ETSO-fund. In this context, “Net Flow” is defined as the country net flow in export and import directions (measured hour by hour). This part of the fund has also to take into account the contribution from the perimeter countries (see below). As such, it is calculated as:

$$\text{“net flow” fund} = 200 \text{ Meuro} \quad \begin{array}{l} \text{– ex-ante estimation of the “declared export” fund} \\ \text{– contribution from perimeter countries.} \end{array}$$

In order to determine the contribution of each TSO in the “net flow” fund, the model “net flow” using “last year” data is applied for each country (for countries with more than one TSO, the internal distribution is to be agreed between the concerned TSOs).

2. ***The contribution of each TSO to the ETSO fund*** is made of:

- a contribution resulting from applying 1 Euro/MWh to “UCTE declared exports” (expected to cover the TSO contribution to the “declared export” part of the fund)
and
 - a contribution resulting from the part of the national tariff included in the “L” (expected to cover the TSO contribution to the “net-flow” part of the fund).
- ***Raising the “declared exports” fund***: In order to raise this fund, each TSO charges 1€/MWh to all exchanges declaring different control blocks for the “source” and “sink”. The precise design of the charge recovery by individual TSOs is left to the decision of this TSO and its Regulating Authorities. Nevertheless, this charge recovery must be in the spirit of getting a fee from those market participants having the responsibility of export flows.

This implies that in some countries it would be the traders while in others the generators connected that are responsible for export flows.

- **Raising the “net flow” fund:** This fund would be raised through socialization in output fees (Ls) in the national tariff of the different countries.

• **Collecting the contribution from the perimeter countries:**

- **for the NORDEL countries:** a Nordel-TSO collects a charge of 1€/MWh on the declared exports from Nordel countries to the continental ETSO area;

- **for UK, Centrel, Morocco, Slovenia:** the concerned neighboring TSO in the continental ETSO area collects an injection fee applying a charge of 1€/MWh on the declared exports from each of the concerned countries exporters/traders to ETSO.

- Perimeter countries are entitled to charge a fee for declared exports coming from the continental ETSO area.

-

3. **Clearing Process and Settlement of differences:** The settlement is required because each part of the contribution is estimated ex-ante, based on the historical data, while the actual contributions paid to the fund are based on the real data from 2002. As the effective income at the end of 2002 may be different from the expected ETSO fund of 200 M€, the settlement of differences is achieved as follows:

• an undershooting value (e.g. 195 M€) will be distributed according to the “Transit key”, calculated from the hourly measured flows in 2002, and the difference (5 M€) reported to the next year mechanism;

• an overshooting value (e.g. 205 M€) will be capped to 200 M€, distributed according to the “Transit key”, calculated from the hourly measured flows in 2002, and the difference (5 M€) reported to the next year mechanism.

4. **Data set:** For the estimation of the “declared exports” fund and the “net flow” fund, a new data set will be collected containing the hourly measured flows and the declared programs between July 1st 2000 to June 30 2001.

The Intervention of André MERLIN, RTE Chief Executive Officer, dated September 14, 2000, Brussels, on the completion of the EU internal energy market

1. Present Situation

- National markets do exist in each European Union State, but there is not a common approach for the internal electricity market.
- For transmission pricing, almost all European states have chosen a point-tariff mode rather than a transaction-based one; however cross-border exchanges still bear "pancaking" of transmission costs.
- Cross-border congestions are generally managed on the basis of priority rules. New entrants can claim that they are unfairly treated, compared to holders of existing contracts.
- Exchanges of technical information between TSOs are absolutely necessary to ensure the security of the European power system. However, they are still limited, due to the suspicion of lack of independence of some TSOs. Indeed, confidentiality of data has to be guaranteed.

2. Near Future

- For cross-border transactions, the Florence agreement of March 2000 stipulates that pancaking must be relieved. As a first step, a new mechanism will be put in place for collecting and reallocating transmission costs of exchanges in the UCTE European Union member states.
- To provide a level playing field for generators, injection rights should be harmonized in all states.
- The best solutions to manage cross-border congestions are to be found in market-based procedures. Among them, a special consideration should be given to transmission rights auctioning and market splitting.
- Market development requires data exchanges between TSOs to be extensively developed, at all time scales. Otherwise, the European power system security could be jeopardized.

3. More Distant Future

- TSOs should synchronize their operations, in particular concerning two procedures:
 - publication and allocation of ATCs (Available Transmission Capacities) for which time scales have to be defined in common between TSOs;
 - submission by generators of their schedules and exports/imports, for which harmonization of "gate closures" could be considered in Europe.
- Market operators and TSOs should have interfaces as simple as possible. In particular, it is important to avoid any confusion between spot markets on the one hand, operated by market operators, and balancing (or regulation) markets on the other hand, operated by TSOs.
- Market operators and TSOs should synchronize their operations. Market operation covers different time scales: futures market on yearly or monthly basis, spot market on daily basis. These procedures will have to be synchronized with allocation of transmission rights by TSOs, and with TSOs gate closures.

Source: <http://www.rte-france.com>

EU situation regarding Transit Capacity Usage

Source: European Power Trading 2001, © 2001 Prospex Research Ltd, www.prospex.co.uk

In 1999 and 2000 the Nordic region was Europe’s biggest trader in both absolute and relative terms. Volumes were an estimated 2,072TWh in 2000, which works out to 5.9 times Nordic physical consumption. But Germany may soon overtake the region. German volumes more than quadrupled in 2000, hitting 972 TWh, or two times German consumption. Volumes are also rising in the UK, Spain and the Netherlands. Volumes are minimal in Italy, but this will change in 2001 when a power exchange is launched and industry restructuring advances.

The network operators have gained strength since market opening. They are in fact some of the biggest beneficiaries of the integrated European market. Cross-border trading is potentially the most lucrative segment of the business: production cost and price differences between national markets are vast. But physical trade cannot exceed the limits set by interconnectors between national systems. Faced with wires demand many times higher than supply, several European network operators have chosen **auctions** to allocate capacity. Unsurprisingly, they have raised substantial funds from these auctions, while traders who “win” wires capacity can only pass on minimal savings to end users on the other side of the border after paying the auction price. This is plainly wrong – customers were supposed to benefit from European market opening,

Table 1. European Cross-Border Transmission Capacity Auction Results

This table shows the results of annual auctions held in 2000 and early 2001. The price per MWh is the traders’ auction costs at full use of capacity year round and at 85% use. Note that this money only covers interconnection access. Standard grid use charges will also be added on both sides of the border. General export charges may also apply.

Trade Route	Auction proceeds, €	Price, €/MWh	
		Full use	85% use
Belgium-Netherlands	8,634,272	3.01	3.54
Czech Republic-Germany	2,868,900	0.50	0.59
Denmark-Germany	852,000	1.62	1.91
France-UK	32,778,441	5.76	6.77
Germany (E.ON)-Netherlands	19,915,848	10.53	12.38
Germany (RWE)-Netherlands	33,992,304	10.90	12.82
Germany-Czech Republic	15,800	0.01	0.01
Germany-Denmark	398,050	0.24	0.28
Netherlands-Belgium	34,440	0.01	0.01
Netherlands-Germany (E.ON)	162,099	0.09	0.1
Netherlands-Germany (RWE)	109,292	0.04	0.04
Poland/Czech Republic - eastern Germany	17,511,900	2.86	3.36
Total	117,273,346		

Source: network operators / Prospex Research

Regional Markets Working Group Paper: Aspects Regarding the Development of Regional Electricity Markets

The unofficial version of the Proposal for a Regulation of the European Parliament and of the Council on conditions for access to the network for cross-border exchanges in electricity makes the following recommendation regarding the method used for congestion management:

"Network congestion problems should in principle be addressed with market based solutions. More specifically, congestion management solutions are preferred which give appropriate price signals to the market parties and the TSOs involved. Network congestion problems should preferentially be solved with non-transaction based methods, i.e. methods that do not involve a selection between the contracts of individual market parties.

In the short term, however, methods for congestion management in continental Europe that may be used are implicit and explicit auctions and cross-border coordinated re-dispatching.

Transaction curtailment, following pre-established priority rules, should be left only for emergency situations where the TSOs must act in an expeditious manner and re-dispatching is not possible. The possible merits of a combination of market splitting for solving 'permanent'

Congestion and counter trading for solving temporary congestion should be immediately explored as a more permanent approach to congestion management."

Annex 1

Interconnections with the second UCTE synchronous zones

Simplified one-line diagram of Balkan interconnected network

Annex 2

ROMANIA

Electricity turnover in 2000

Annex 3

HUNGARY

Export-import turnover in the year 2000 in Hungary (TWh)

The structure of the electricity consumption in 2000 in Hungary

Topology of the Hungarian National Grid

Annex 4

BALTIC COUNTRIES

Electricity turnover in the year 2000 (TWh)

Interconnections with the second UCTE synchronous zones



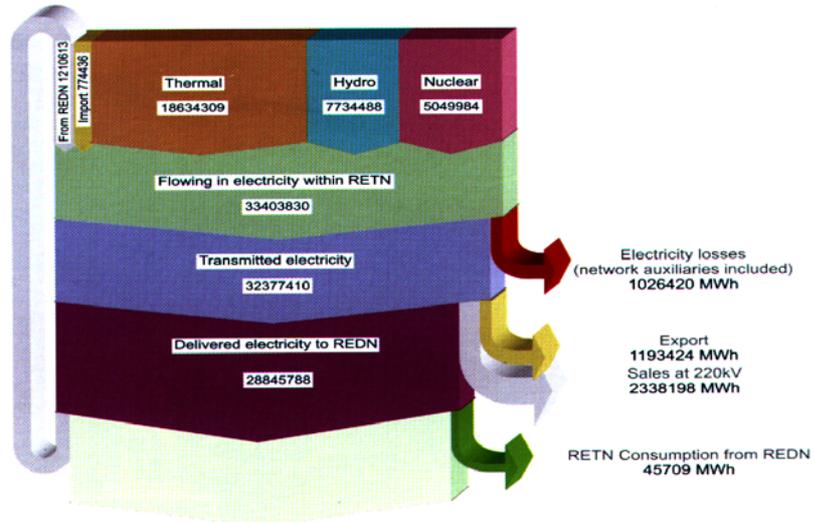
UCTE INTERCONNECTION



ROMANIA

Electricity turnover in 2000

TRANSMITTED ELECTRICITY THROUGH THE 400kV AND 220 kV NETWORK IN 2000 (MWh)



Legend:

REDN - Romanian Electricity Distribution Network
 RETN - Romanian Electricity Transmission Network

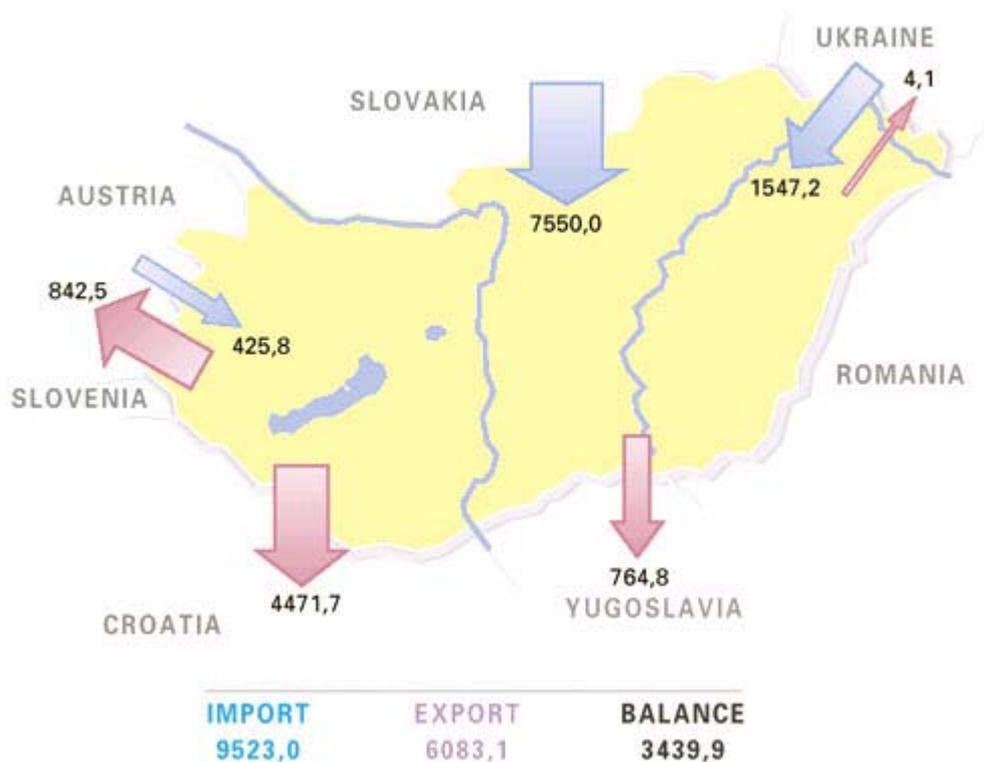
ELECTRICITY EXCHANGES THROUGH CROSS-BORDER LINES IN 2000 (GWh)



Source: Transelectrica SA, Annual Report 2000

HUNGARY

Export-import turnover in the year of 2000 in Hungary (GWh)



The structure of the electricity consumption in 2000 in Hungary

