Institute of Energy for South East Europe (IENE)

3rd SE Europe Energy Dialogue

ENERGY COOPERATION AMONG THE SEE ENERGY COMMUNITY TREATY STATES

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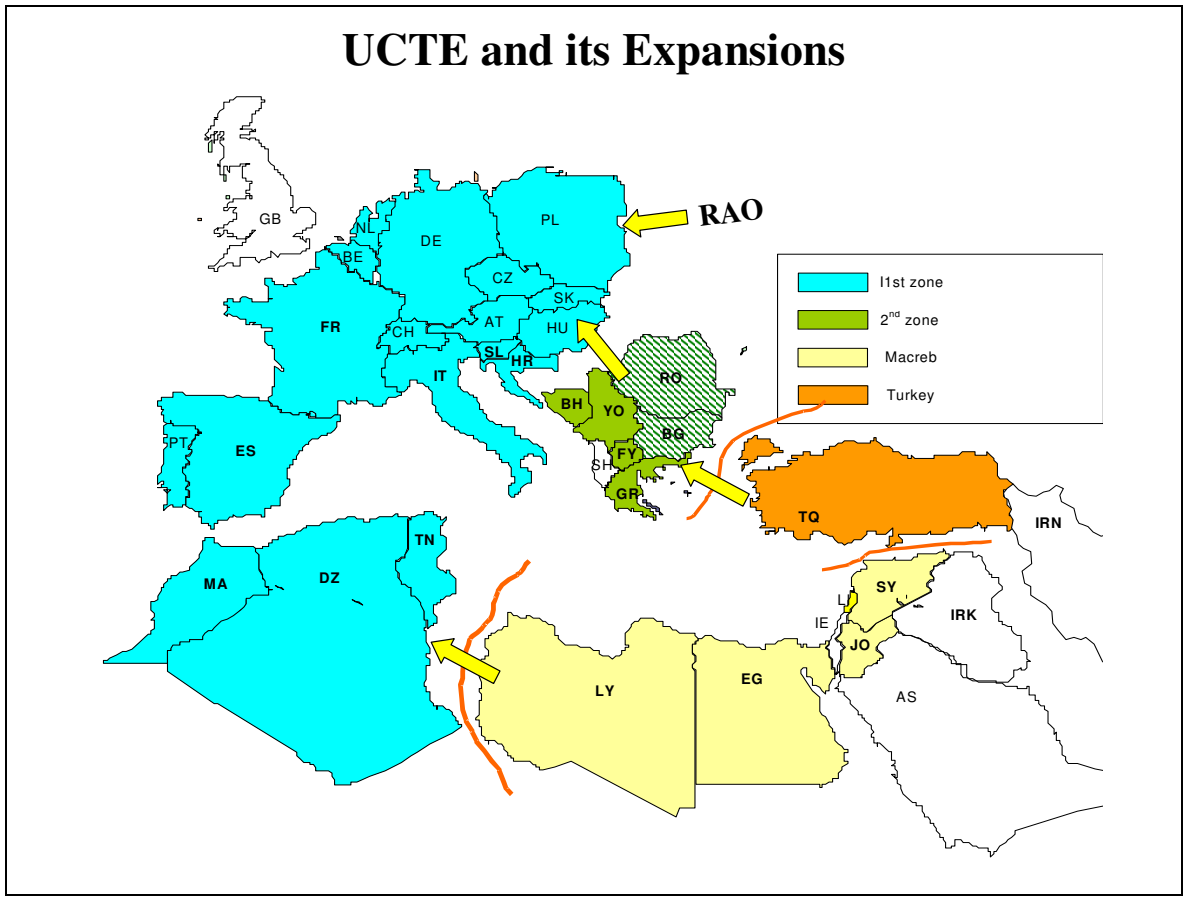
1. General overview

At present, the power systems of South East European (SEE) countries (Albania, Bulgaria, Bosnia and Herzegovina, the Former Yugoslav Republic of Macedonia, Greece, Montenegro, Romania, and Serbia including Kosovo), operate on parallel and synchronous mode with UCTE network.

It is worth to mention here that the power systems of Armenia, Azerbaijan, Georgia, Moldova, Russia and Ukraine belong to the IPS/UPS group of power systems that operate with different standards and independently from UCTE. The IPS/UPS group includes also many more countries such as the Baltic States (Latvia, Lithuania, and Estonia), Belarus, Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan.



The Turkish system operates independently from both UCTE and IPS/UPS systems. Turkey has applied to become a member of UCTE and a study has been carried out investigating this possibility.

The synchronous interconnection of the IPS/UPS with the UCTE system is a difficult task that is under consideration by a group of 80 experts from 17 countries from both sides. The size and complexity of such a task have never been mastered before on a worldwide basis. A series of technical studies are needed to asses the conditions under which the synchronous interconnection of the two systems is feasible without negative impact on their reliability. The connection of two huge power systems, with different generation and network structures, norms and standards, and rules of operation, needs the establishment of a minimum set of technical requirements, organizational structures and procedures, as well as legal agreements. Above all, it is also a delicate political problem.

Because of this, many studies and multilateral negotiation procedures are required before any sound and concrete decisions become mature enough, in order to be accepted by all involved parties and be eventually implemented.

For the UCTE-IPS/UPS connection the feasibility study mentioned above has started in 2005. This study will last a couple of years after which the detailed connection studies have to be initiated and these could last several more years. **Consequently we do not expect, in the foreseeable future, a full (synchronous, asynchronous or mixed) connection of the UCTE and the IPS/UPS power systems**.

Thus the dream of an **"Electricity market from Lisbon to Vladivostok"** may need time, and maturity to be realized. Consider e.g. the BSEC countries. Some of them are synchronized with the UCTE system where as others are synchronized with the IPS/UPS system, or are operating separately from both (e.g. Turkey). Therefore it seems reasonable that a **staged approach** is necessary to be developed in order to strengthen cooperation in the electricity sector of the broader SEE region.

The use of non-synchronous connections (DC links), a relatively easy to implement, proven, and reliable technology minimizing the influence of connected power systems on each other, should be investigated.

Bilateral agreements between neighbouring countries to improve or build new interconnecting infrastructure and operate it by islanding a small part of the network of the one country and attaching it to the system of the other country may be a temporary, though not completely efficient, method of cooperation.

There are at least three cases where such a method has already been or will be applied:

- The thermal power station of Burshtyn together with the substation of Mukacevo have been separated (islanded) from the rest of the Ukrainian system and, together with the necessary interconnecting lines, have been attached to the Rossiori substation of the Romanian system and to the Velke Kapusany and Sajoszoged substations of the Hungarian system, thus injecting power to UCTE.

- In Bulgaria, the thermal power station Maritsa Istok 3 has, in the past, been attached to the Turkish power system.

- A similar islanded operation of a part of the Turkish system (in Babaeski) with the Greek system can be applied, temporarily, using the new 400kV interconnection line

between the two countries, until the whole Turkish system is finally accepted to operate in full synchronous mode with UCTE.

Regarding the synchronization of the Turkish power system with the UCTE power system we note that the complementary technical studies to that effect have started on 11/2005 and were completed on April 30th, 2007. They will be followed by the presentation to the UCTE Steering Committee of a catalog of technical measures to be taken by the Turkish TSO. If the Turkish side applies these measures promptly, a test synchronization period is foreseen before the definitive synchronization. Consequently we can probably expect that the Turkish power system will be synchronously connected to the UCTE power system in a couple of years.

2. Infrastructure Investments in SEE

We all agree that cross-border trade is of extreme importance for all our countries. To exploit the high energy trade potential of the region we should undertake concrete measures to overcome existing differences in traditions, cultures, economic level, and bureaucratic status and to adopt the appropriate legislation in order to encourage foreign investments and trading. In addition we need to strengthen the existing Interconnections and build new Infrastructure in order to enhance the Net Transmission Capacities available for Cross Border Trading.

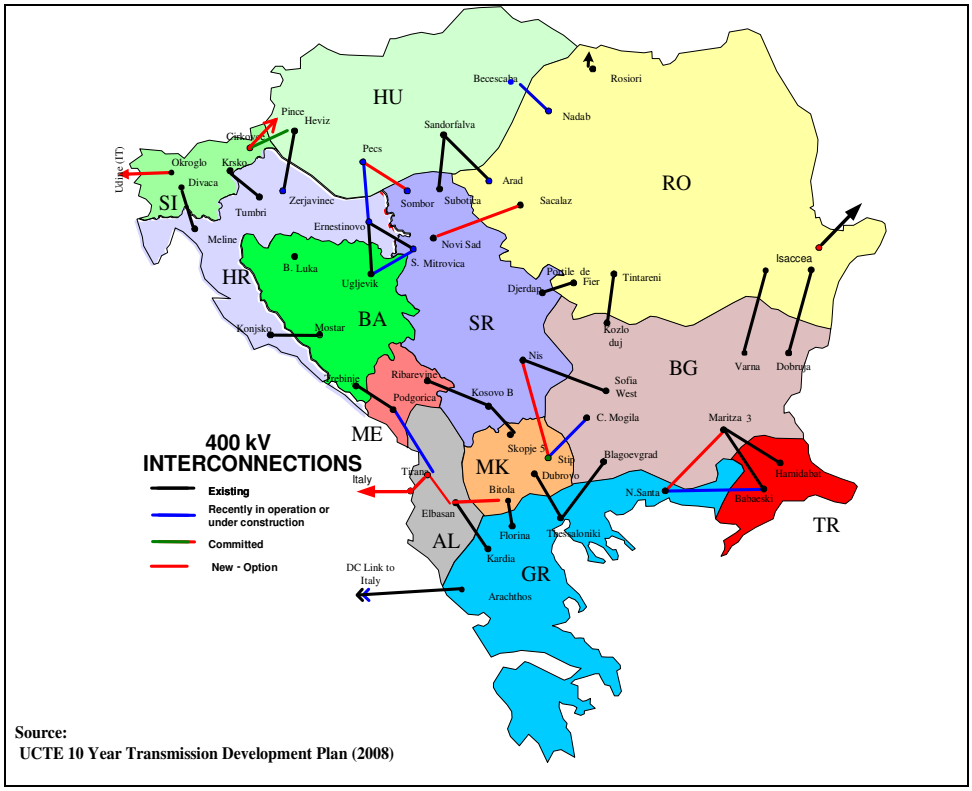
Infrastructure across the borders is an important prerequisite for an integration of the electricity markets of SEE countries. If there is a need for developing infrastructures, investments should be carried out in a co-ordinated way and follow market integration.
Improving the infrastructure can increase the security of supply and contribute to a better environment and increased competitiveness. For these reasons supporting of investments in infrastructure is sine qua non.

There are many differences among the national power systems of the region, in terms of size, power mix and even load profiles. Moreover, as a result of different economic conditions, there are varying projects for the development of the power systems in each country. In what follows we present only those projects that are of multinational interest.

Despite the large number of interconnections between the Balkan countries none operates between Albania and the Former Yugoslav Republic of Macedonia. This fact impedes the bilateral energy exchanges and thus the development of electricity transactions between the aforementioned countries. On the other hand, recently, the Former Yugoslav Republic of Macedonia and Bulgaria have commissioned the Cervena Mogila (BU)- Stip (FYROM) 400kV line. This line, together with the second 400kV line between Bitola (FYROM) and Florina (GR) inaugurated in summer 2007, have increased significantly the security and the level of transactions in the southern part of SEE.

The existing transmission lines and interconnections among the national power systems of the SEE region permit transactions ranging from 250 MW to 2000 MW, depending on the origin, destination, path, and time period. However, they are not always sufficient to cover the respective power transfer needs. Lack of interconnections between the Former Yugoslav Republic of Macedonia with Albania (Bitola-Elbasan), is considered to be a serious obstacle limiting trade in the region. One should not omit to mention here the importance of the Adriatic interconnection line, the interconnection line Elbasan-Tirana-Podgorica, and the interconnection of the Former Yugoslav Republic of Macedonia with Nis (Serbia).

These are some examples of important interconnections within SEE that have to be implemented or restored.



Source:
UCTE 10 Year Transmission Development Plan (2008)

There are some other interconnections, currently under development or discussion (for details please Tables 1, 2, 3 and 4). Most of them present a wider regional interest and are expected to contribute to the development of the appropriate infrastructure necessary for the parallel and synchronous operation of the power systems of SEE and beyond (Turkey and BSEC countries not in SEE Energy Community).

3. Energy Community

In an open electricity market load flows are not only caused by the current regional demand and production, but also influenced further on by the different prices of various regions of Europe. Thus, the regional energy co-operation is of outmost importance and has two targets:

- to ensure a secure energy supply to all customers and
- to minimize the investment costs.

Achieving electricity market integration requires political agreement, as well as technical common understanding of the best ways of interconnection of networks and markets. For this reason, geographically gradual progress in integration across a region appears a pragmatic way to approach these objectives. This idea has led to the creation of what has been called the **Energy Community** in SEE.

As is well known, all the countries from the South Eastern European (SEE) region have agreed upon the constitution of an **Energy Community** in SEE. The Treaty establishing the **Energy Community** was signed on the 25th of October 2005 in Athens and was set in force as of July 1st, 2006.

The Energy Community has as its task to organize the relations between the Parties, to harmonize network access rules, to facilitate Cross Border Trading, to mitigate congestion problems that impede free trade, and at the same time to secure the operation of the interconnected systems and create a legal and economic framework in relation to **Energy**.

The main goals are to create a stable and regulatory market framework capable of attracting investment; to create a single regulatory space for trade; to enhance security of supply; to improve the environmental situation and to develop electricity and gas market competition on a broader geographical scale in accordance with the **acquis communautaire** as established in articles 81, 82, 86(1) and 86(2) and 87 of the European Community Treaty and described in detail in EU Directives 2003/54 and 2003/55 for electricity and gas respectively, as well as in Regulation 1228/2003.

The common objective of the Energy Community Treaty States is to stimulate and underpin the secure supply of energy, especially electricity and natural gas, to their citizens, and to secure economic growth and investment in South East Europe by improving the availability, efficiency and reliability of network energy sources at reasonable cost. The parties seek to achieve this objective through promoting greater regional integration, the creation of a compatible regional energy market, competition and increased trade within the SEE region and between it and the European Union internal energy market. The ultimate aim is to have **a single regulatory space for electricity and natural gas trade in the region that will help as a prototype for the whole EU in its way towards the ultimate goal of creating a single Internal Electricity Market in Europe**.

3.1. Obstacles

Some progress has been made so far within the Energy Community. Removal of barriers to trade is a key issue to facilitating the market. It is worth to mention here that according to the European Internal Market for energy rules, import and export monopolies are not permitted, and the countries can not levy import and export duties, or VAT for physical and financial cross-border transactions. However the progress so far is not satisfactory. **The development of a regional electricity market is a project far more complicated than the liberalization of a national electricity market.** We must not forget that in EU, e.g., it took more than 10 years of hard negotiations between the Member States in order to adopt the initial Directive 96/92 for the establishment of the Internal Electricity Market in Europe. The project is even more difficult and challenging in the region of the SEE countries, for, in this case, one must take into account the following important issues:

- The SEE region consists of countries with various national, religious and cultural origins.
- Most countries of the region are going through a transition period that involves structural, political, and economic changes.
- The state owned, vertically integrated utilities covering all stages of power generation, transmission, distribution and supply has led to the development of national electrical systems with a number of shortcomings, especially with respect to the proper utilization of the investments.
- There are wide variations between the countries in terms of their existing and future internal electricity market structures, the pace at which reform may take place, the changing demand patterns and the fuel supply situation. As a starting point, it can not be assumed that all countries will have the same need or desire to trade in a similar manner at the time when a regional market is initiated. It may therefore be desirable to establish a market structure that has the flexibility to cope with the differing possibilities to trade.

3.2. A staged approach

The establishment of a regional market in SEE is expected to have immediate positive effects in system reliability, economies of scale in planning, constructing and operating generation and transmission systems. In addition to these immediate benefits the generation of a regional market will exercise competitive pressures on existing systems, increase their efficiency and encourage inflow of private capital.

An essential feature of the regional market design should be to acknowledge that flexibility might be required to accommodate the approaches taken in each country in restructuring their electric systems and in the design of their own markets. The regional market should ideally allow each country to have maximum flexibility in determining what capacity and energy it may wish to buy or sell and the type of transaction that it may wish to use. An efficient market design should allow market participants a maximum choice in trading opportunities. Therefore, in developing options for a regional market design it is helpful to understand the type of transactions that would be possible between national systems.
In general, there are three durations of capacity and/or energy transactions possible, corresponding to different requirements to balance national energy markets through trading:

- Long-term generating capacity and/or energy for one or more years to meet a capacity or generation shortage;
- Medium-term seasonal generating capacity and/or energy for a month, week or day to smooth out the load curve;
- Short-term balancing as in an hourly spot energy market.

A prerequisite for the successful integration of the electricity systems of the SEE Region is the development of national system operators, **independent of commercial interests**. The operation of the system is one of the key functions in a common electricity market. The system operators are responsible for the security of supply and the reliability and efficiency of the electricity system in a given area and its inter-connectors with other systems. Collaboration and co-ordination between the system operators is a prerequisite for the establishment of a Regional Market and the development of new inter-connectors to increase trading opportunities.

Building new interconnectors is the relatively easy part. The creation of strongly harmonized market arrangements is the most difficult and challenging issue. It requires the strong commitment of all governments to develop the appropriate and harmonized legislation and to create a Coordinated Auction Office, as has been already proposed in the Athens Forum 3 years ago, in order to apply common procedures for cross border congestion management.

Epilogue

The region of SEE countries is characterized by a number of different, frequently separated, electricity “markets” in various stages of early development. In some cases the pricing mechanisms adopted are inadequate to encourage long-term investment in new electricity generation capacity. In most cases this is due to the fact that retail prices, as set by governments, are far below the cost of new entry. **It will be a great challenge for the politicians to provide the conditions for consumers to choose their suppliers, and, at the same time to convince them of the need to raise prices up to the level of real costs**. The situation is even more difficult in those countries with economies in transition in which the rates of collecting electricity bills are still very low. It is obvious that such obstacles can only be overcome when the economies of the countries converge. And this needs time.

ANNEX

Countries abbreviations:
IT: Italy, BH: Bosnia & Herzegovina, HR: Croatia, HU: Hungary, GR: Greece, RO: Romania, AL: Albania, SR: Serbia, BG: Bulgaria, MD: Moldova, TR: Turkey, KO: Kosovo, ME: Monte Negro.

Table 1: Projects recently completed in the SE Europe

Project description	Comment
400kV HVDC submarine cable Galatina (IT)-Arachtos (GR)	Project completed in 2003.
Reconstruction of 400kV OHL - Trebinje-Gacko-Mostar (BH) – Konjsko (HR) - Mostar-Sarajevo (BH) - Sarajevo-Tuzla-Uglievik (BH) - Uglievik (BH) -Ernestinovo (HR) - Mostar substation (BH)	Reconnection with the UCTE (9.11.2004) - Completed - Completed - Completed - Completed - Completed
Reconstruction of 220kV OHL - Tuzla (BH)-Dakovo (HR) (2 lines) - Jaijce/Prijedor (BH) – Mraclin (HR) - Prijedor (BH) – Meduric (HR)	Reconnection with the UCTE (9.11.2004) - Completed - Completed - Completed
400kV T.L. Arad (RO) and Sandorfalva (HU)	Project completed.
400kV T.L. Uglievik (BH) – Mitrovica (SR)	Completed in mid 2006
400kV T.L. Bitola (FYROM) – Florina (GR)	In operation since July 2007.
400kV T.L. Filippi-Nea Santa (GR) - Babaeski (TR)	Construction completed in summer 2008. Related to this project is the construction of the 400kV double-circuit line Lagadas-Filippi in Greece.
400kV T.L. Stip (FYROM) - Ch.Mogilla (BG)	Completed by end of 2008.
400kV T.L. Nadad (RO) - Békéscsaba (HU)	Completed by end of 2008.

Table 2: Projects under construction

Project description	Comment
400kV T.L. Stip (FYROM) - Nis (SR)	Project agreed and initiated. To be completed by end of 2011.
400kV T.L. Tirana (AL) - Podgorica (ME)	Project under construction. To be completed by end of 2009. The internal Albanian 400kV line Tirana-Elbasan is directly related to this project Greece has also expressed an interest for this interconnection.

Table 3: Projects under discussion

Project description	Comment
400kV Interconnection FYROM-Albania-Italy Constanta (RO) – Pasakoy (TR)	Project under investigation. Feasibility study ongoing (BG, FYROM, AL, IT).
400kV submarine link between Romania and Turkey	Project under investigation. Preliminary studies ongoing.
400kV T.L. N.Santa (GR) – Maritsa 3 (BG)	MoU signed last April in Sofia.
HVDC submarine cable between Italy and Greece	Following the completion of the 400kV 500MW submarine DC link in 2003, a second submarine DC link is envisaged.
400kV T.L. Sacalaz (RO) – Novisad (SR)	Under discussion
400kV T.L. Bitola (FYROM) – Elbasan (AL)	Under discussion
400kV Cable (AL) – (IT)	Merchant Line
400kV T.L. Pecs (HU) – Ernestinovo (HR)	Under discussion
400kV Cable (IT) –(HR)	Under discussion
400kV T.L. Circovce (SI) – Pince (HU)	Under discussion
400kV T.L. Circovce (SI) – Heviz (HU)	Under discussion
400kV T.L. Circovce (SI) – Zerjavinec (HR)	Under discussion
400kV Cable Tirat (ME) – Villanova (IT)	Under discussion

Table 4: Projects rejected

Project description	Comment
220kV T.L. Vrutok (FYROM) - Burrel (AL)	Project not further considered. It was the first proposal for the electrical interconnection of Albania and FYROM.
400kV T.L. Bitola 2 (FYROM) - Elbasan (AL)	Project not further considered.
220kV T.L. Vlore (AL) – Igoumenitsa (GR)	Project not further considered. Both countries decided to reject the project and focus instead on the Elbasan-Tirana-Podgorica line.
400kV T.L. Iasi (RO) – Chisinau (MD)	Project not further considered. The Moldovan side has not expressed a definite interest for this link.
400kV T.L. Zrenjanin (SR) – Timisoara (RO)	Project rejected.
400kV T.L. Sombor (SR) – Pecs (HU)	Project rejected.
400kV T.L. Suceava (RO) – Balti (MD)	Project rejected.
400kV T.L. Slopje (FYROM) – Nis (SR)	Important but not further considered