



**European Regulation Forum
on Electricity Reforms**

Berlin SESSA Conference “Perspectives and Challenges of EU Electricity Enlargement” Scientific Consensus

SESSA, a programme financed by the European Commission, is a European forum on electricity reforms involving researchers and energy stakeholders (<http://www.sessa.eu.com/>). The first SESSA Conference, *Refining Market Design*, was held in Cambridge, on 14-15 July 2004. The second SESSA Conference, *Addressing Market Power and Industry Restructuring for Consumers Benefits* took place in Stockholm, on 7-8 October 2004.

The third SESSA Conference, *Perspectives and Challenges of EU Electricity-Enlargement*, was held in Berlin, Germany, on 9-10 December 2004, organized by Christian von Hirschhausen and Georg Zachmann (DIW Berlin). The objective of the conference was to discuss the perspectives and the challenges of electricity sector reforms in the new East European EU member states (Poland, Czech Republic, Slovakia, Hungary, Lithuania, Latvia, Estonia, Slovenia) and candidate countries (Romania, Bulgaria, Croatia) (we do not cover Malta and Cyprus). The conference combined background papers and contributions written specifically for this event, with an extensive exchange of ideas between the relevant stakeholders engaged in the region. This paper represents the consensus view of the academic SESSA participants, and not necessarily those of the stakeholders who attended the conference.

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The Objective of Electricity Enlargement: Moving towards a Single Sustainable European Electricity Market

The objective of EU Electricity Enlargement consists of moving towards a *single*, sustainable European electricity market. A *single* market refers to the expectation of a competitive market and the efficient allocation of generation and transmission resources, at least at a regional level, if not at the level of the new EU 25 at large. As discussed at earlier SESSA conferences, *sustainable* refers to the ability of the electricity system to meet the environmental objectives of the EU, in particular with regard to the share of renewables in electricity production and the greenhouse gas targets, while assuring reliable electricity supply at reasonable cost. Whereas the political EU-enlargement can already be considered a success, the electricity

enlargement is far from being achieved. The experience from the last decade shows that electricity enlargement is not a linear “transition” of the new member states towards a pre-defined ideal type model of an EU-electricity sector. Rather, the reform path resembles a stormy journey, where two steps in the right direction may be followed by one step back, or one step sideward. Hence the remaining policy issues are broad, ranging from the establishment of the appropriate regulatory framework, the creation of an efficient wholesale market, to instruments to foster a sustainable fuel mix and sufficient generation capacity, and – last but not least – market integration across borders.

Gradual Reforms, but Much Remains to be Done in the CEE Electricity Sector

When assessing the reform path of the new East European EU member countries (Poland, Czech Republic, Slovakia, Hungary, Lithuania, Latvia, Estonia, Slovenia) and candidate countries (Romania, Bulgaria, Croatia), one must not forget their socialist legacy and very difficult point of inception. In the early 1990s, these countries' electricity sectors were faced with outdated and polluting power plants, one-sided network integration towards the East, a distorted price structure, and inefficient management structures. Over the last decade, all new member states have made substantial progress on the way to joining the EU-15 towards a single European electricity market. In purely technical terms, this objective was already achieved for the Central East European Countries as early as 1995, when the CENTREL-countries (Poland, Czech and Slovak Republics, and Hungary) were integrated in the UCTE system (Slovenia is a UCTE member since 1987).

However, in economic, commercial and regulatory terms, the adaptation process leaves many reform steps to be desired. Most new member countries have only achieved “semi-commercialization”. Price adaptation towards full cost-recovery and an adequate relation between industry and household prices is not achieved in many countries. Effective regulation is lacking in

several countries, where regulators have only a limited degree of independence and capacity; this hampers the emergence of a stable energy policy environment. Privatization of generation and distribution companies, pushed strongly in the early reform phase, has decelerated recently. Customer switching is gaining importance for industrial customers in some countries. Domestic retail competition in the commercial/domestic market, an objective of the EU Directive - which is currently being debated – is still underdeveloped (and generally not even allowed).

The three major benchmarking approaches available to-date confirm that the new member states have progressed in their reform efforts, but that they still have a long way to go to attain fully commercial, competitive and sustainable electricity sectors:

- The EU “Annual Reports on the Implementation of the Gas and Electricity Internal Market” (EU “Benchmarking Reports”) regularly place most new member states in the lower half of the countries (though no explicit ranking is attempted). Unfavourable assessments are provided for the unbundling of distribution system operators, consumer switching, market concentration (for some of the countries), the insufficient role of wholesale

markets, the little progress in creating balancing markets, and the persistence of non-market based long-term power purchase agreements (PPAs). In the 4th EU Benchmarking Report (January 2005), all new member states are classified as having major obstacles to competition;

- the European Bank for Reconstruction and Development (EBRD) bases its annual infrastructure reform indicator for the electricity sector in the transition countries on three criteria: commercialization, competition and network access, and independent and accountable regulation. With regards to these objects, a few new member states have reached a level comparable to the “normal” standards required from EU member countries; among them are Hungary and the Slovak

Republic. But progress in the majority of countries is considered unsatisfactory (e.g. Estonia, Croatia);

- a more detailed benchmarking indicator has been assembled in the framework of the SESSA-project by DIW Berlin and Dresden University of Technology, based on the methodology proposed by OXERA in its recent study on benchmarking EU15 electricity reforms. This indicator combines a competitive market score and network score to obtain a global “electricity market score”. In the DIW ranking, Hungary, Slovenia and Latvia achieve scores comparable to those of mid-range EU-15 member countries; once again, Estonia and Croatia fare worst, confirming estimates by the EU and EBRD.

Obstacles to Creating Competitive Markets

The objective of creating competitive electricity markets is set out in the EU Electricity Acceleration Directive 2003/54/EC. It implies unbundling of transmission and distribution, non-discriminatory access to the transmission and the distribution networks, and a low market concentration. After considerable progress in the late 1990's, it now seems as if the creation of competitive markets has slowed down recently; in some cases it has even been reversed. Foreign investment, though important for raising funds and improving internal efficiency, can only partially be expected to enhance domestic competition, and may eventually impede international competition by creating a Europe-wide oligopoly.

Unbundling at the distribution level has been done in accounting terms only in most new member countries. But even at the level of transmission system operation, unbundling has been half-hearted in many cases, and third party access (TPA) to the transmission grid is not regulated efficiently. Thus, Hungary's MVM, the owner of the transmission grid, remains de facto vertically integrated, with major stakes in electricity generation, and some engagement in distribution. Likewise Croatia hangs on to vertical integration, centred around a market-dominating electricity producer.

Concentration in electricity generation (as measured for example by the Hirschman-Herfindahl-Index) remains high in most new member countries. Since most of these systems are small, high domestic concentration is rather natural, and could be offset by international trade.

This, however, is not the case, so that often the relevant market is still national, not regional. Recent trends to reintegration might limit the extent of competition (such as the proposed though finally unachieved merger between the dominant players in the Czech Republic and in Slovakia). Poland is also taking action to concentrate generation capacities into few large production associations. The idea that “national champions” are required to withstand foreign investors and competition is gaining popularity in the region, which thus emulates similar earlier trends in the EU-15 electricity markets.

There are practically no workable wholesale markets operating in the region. The largest of them, the Polish Power Exchange (PolPX) trades but 1% of total electricity consumption, and suffers from low liquidity. The underdevelopment of wholesale markets in the region can be explained by the legacy of long-term power purchase agreements (PPA), which, for the largest part, have not been struck according to market terms (e.g. in Poland, Hungary). Thus, competition authorities need to distinguish between PPAs, signed between producers and consumers, which are an important institution to ensure investment adequacy and reduce market power, and “old” post-socialist PPAs which enable incumbent large producers to sell the output of small producers and therefore enhance their effective market share and power. One way of resolving the issue is to make these PPAs tradable in the market and restrict dominant players from access to PPAs that enhance their market power.

Fuel Mix and Adequacy of Investment in Sustainable Generation Capacity

Concerns about a backlog of investment in generation capacity in the new member countries are wide-spread. These concerns seem to be unfounded, though: generation capacities in the region are still substantial, and the life-time of most of the power plants can be extended by another 10-15 years. Electricity consumption is only increasing gradually; in addition, this growth will be contained if the necessary price increases will be implemented. Also, semi-commercialization and only half-hearted price adaptation reduce the commercial interest to invest in new generation capacities in new member states. In some cases, a lack of political commitment to reforms and/or time inconsistency of the regulators add to political and economic risk.

With regard to the fuel mix, there seems to be a large discrepancy between the political vision to move towards a renewable and non-carbon fuel mix, and current reality. The latter is that traditional energy sources, considered to be dirty or dangerous, are thriving: coal and nuclear energy:

- Although there are attempts to push the role of *renewable* energies in the fuel mix, these only play a marginal role in most new member countries. Water has a substantial market share in Latvia (~50% of annual electricity production), Romania (30%) and Slovenia (27%). Wind energy is benefiting from feed in tariffs (>9 ct/kWh) in Latvia, and the Czech Republic, though its overall market share in the region remains modest (0,2 % in 2002). Solar energy is hardly used at all for electricity production and heat supply. The new member states are still far away from the target fixed in the directive 2001/77/EC on electricity from renewable energy sources (11% of electricity generation in 2010). It would require a particular political effort to remove barriers and guarantee a stable regulatory

environment to investors should renewable increase their role. Given the current experience with regulatory bodies this might involve long-term contracts for energy take off or legally binding feed in tariffs. What is also needed is the combination of international technology and local learning. Governments might push for the initial percentages of market share, in order to allow the countries to start reaping scale economies;

- *coal* (mainly lignite, some hard coal) is experiencing continuous popularity in several countries. Coal is the only primary energy in significant amounts in the region, and there is a strong propensity to continue to rely on this domestic fuel. This is not only the case in Poland, where around 90% of the electricity is produced using domestic coal, but also in Hungary, the Czech Republic, and Romania. It is unclear whether the recent environmental legislation and CO₂ emissions trading will lead to a reduced the use of coal or not;
- although the recent history of nuclear power plants in Eastern Europe is full of technical incidents, most new member states are eager to hang on to this supposedly low-cost technology, and perhaps even expand it. Several countries have announced plans to expand nuclear energy, e.g. Romania (Cernavoda 2, to be commissioned in 2006), Slovakia (Mochovce 3 and 4), and Bulgaria (reactivation of the project in Belene). There are high sunk costs into expansion or newbuilds, and how these projects could be financed is rather unclear at present. Whether the plant closures negotiated with the European Union will take place as agreed (in particular Ignalina in Lithuania) remains to be seen.

Towards truly Integrated Regional Markets?

The development of competitive markets in Eastern Europe is closely related to the region's ability to enhance cross-border flows. This requires a more efficient use of the existing capacities, a change of the regulatory regime on cross-border trade, a more efficient pricing system for congested transmission lines and – eventually – the construction of new domestic and cross-border transmission capacities. International trading relies on, but can at the same time enhance, the liquidity of local energy markets.

At present cross-border trade plays but a minor role (below 10% of total electricity consumed). Electricity trading is concentrated in sub-regional markets, which seem to emerge based on network characteristics, but also driven by certain political alliances:

- the CENTREL-countries (Poland, Czech and Slovak Republics, Hungary) are emerging as the core-zone in Eastern Europe (Slovenia and Croatia could also be considered as being part of this region). Within this grid system, cross-border capacities are still relatively low (e.g. between Hungary and the Slovak Republic);
- South Eastern Europe (SEE) consists of the EU membership candidates Romania and Bulgaria (which were resynchronized with the UCTE grid in November 2004), and the Balkan states (except Albania);
- the Baltic countries (Lithuania, Latvia, Estonia) are still part of the North-West Russian electricity system, and nothing indicates that they would join UCTE in the near future. There is no interconnection with UCTE.

Basically, there are two strategies with respect to market design and regional integration: i) the *individual* approach consists of each country developing its own market arrangement while respecting a minimum set of common rules on cross-border trade.

In this model, close market integration is only gradually pursued later on; ii) a *regional* approach would consist of putting in place a standard market design model for the organization of the electricity markets of the region. The regional approach is preferable, if one wants to work towards a single European market. However, reality shows that national strategies may be difficult to coordinate. Thus, the three Baltic countries have been unable to coordinate their electricity markets thus far, though each of them is small and very simply structured.

Inefficient capacity pricing furthermore hampers the emergence of regional markets. Capacity auctions for interconnections are underdeveloped and often intransparent. Uniform network access prices within the countries do not take into account congestion, leading to a suboptimal use of transmission capacity. Some form of locational network pricing should be introduced to make more efficient use of the existing transmission capacity, both at the national and at the cross-border level. Only then reasonable decisions on the construction of *new* transmission lines can be taken. In any case, a very strong, mutual political will would be required to push through additional interconnection projects.

In the medium term, it will become more important to look beyond the current EU and UCTE borders. A resynchronization of the two UCTE zones was achieved on November 9 2004. In particular, *Russia* and *Ukraine* are emerging as the new "frontier" of the EU electricity market. Physical interconnection with the former CENTREL-countries could be reactivated, e.g. a 750 kV line between Hungary and Ukraine. Large exports of (nuclear) electricity from Russia and Ukraine towards the EU seem unlikely in the future, but at the regional level these two countries will play an increasingly important role for trading, perhaps also for investment. Not least because of the targeted expansion plans of the new Russian national energy champion, Gazprom.