

Application of the Competition Law to the Electricity Market (2007)

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Blind faith is unlikely to produce a free market that is competitive.

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Introduction: Need for competition rules in regulated markets

In the last twenty years, several attempts are made, with the ideological support of the World Bank and IMF, to open the electricity industry, which creates significant impacts on all branches of the industry through price and reliability of its product, to competition in both developed and developing countries by way of rapid liberalization. The liberalization works, which were conducted by unbundling generation, transmission, distribution and retail sales from each other, certain parts of which were conducted by private enterprises, raised great expectations based on the assumption that together with the other “blessings” of privatization, decision-making mechanisms of competitive markets will give rise to more effective results on the whole economy.

For being capable of realizing the benefits of liberalization, the industry must be reorganized in such a manner as to operate through competitive markets. As defined in other sections of this book, due to problems in the cost structure of the electricity industry, at the end of the process of liberalization, an automatic transition to a competitive structure is not possible. Due to this problem liberalization shall be designed under concerns with regard to competition. For example, adopting in the design of biddings any system that does not fit to the present market structure will not create competition, but manipulated prices as a result of collusion.

Blumsack achieved the following conclusions on base of a comparison made between restructured and not restructured states of the United States electricity industry:

- In restructured states, no significant reduction in prices has been observed, no reduction in operational costs has occurred, and no thermal efficiency increase has occurred,
- Increases in cost due to liberalization came up, like the lack of competition in markets with regard to obligatory services, the obligation of paying a fee for transmission service capacities not being used and an increase in financial costs due to an increasing uncertainty,
- No competition could be created in the retail sales market, and
- The market does not operate in a proper manner due to the fact that the transmission system is not designed as to fit the electricity transmission between different regions².

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² Seth Blumsack, J. A., Lester Lave (2006). "Lessons from the failure of U.S. Electricity Restructuring." The Electricity Journal **19**(2): 15-32, p.16.

Unbundling generation, transmission and distribution functions, which former worked within a vertically integrated structure, and opening them to competition caused that the price in the wholesale electricity market is now determined by the market mechanism. The price of the transmission service, which shall remain with public, will become a variable, which regional electricity distributors will have to take into consideration while taking commercial decisions. Generation companies will decide to which extent they will use their capacities, and how they will diversify their variable costs and capacity structures by making investments in which kind of power plants, by taking into consideration the movements of their competitors and the distribution companies. It does not seem possible to estimate whether this kind of changes, which will occur in the operation of the decision-making mechanisms of the industry, will cause the “efficiency expected from free competition”.

Nevertheless, definitively these changes will enable electricity generation facilities to gain a market power and will give rise to the possibility that these powers might be abused by them. According to the researchers, whose determinations with regard to the failure of liberalization to reach the purpose of increasing total welfare with regard to the U.S. have been given in the foregoing, the cause thereof is that the bidding system has not been designed in accordance with its purpose; the demand side does not act as flexible as the supply side; costs of services like transmission or regulation, which formerly were not paid for, have been included into the system; dependency on retail sales companies increases the risks and generation companies may not be prevented from using their market powers.

1. Market Power in the Electricity Industry

At the round table meeting of the OECD in 2002 with regard to competition problems in the electricity industry, it has been concluded that the industry may be exposed to a use of market power because of the following reasons:

- The non-flexible structure of the market arising from the fact that buyers do not immediately respond to price changes,
- Low supply flexibility, since electricity cannot be practically stored,
- Limited transmission capacity and failure in the infrastructure,
- Limited generation capacity and differences between the marginal costs of different kind of power plants³.

Nevertheless, the measurement of the concept of “market power” in the electricity industry must be made differently from other industries because of physical properties with regard to generation and transmission in electricity. Therefore, after giving the conventional definition of the market power in industrial economics, we will try to clarify what this concept will mean for the electricity industry.

1.1. What is Market Power?

Market power is the power of a company to determine its price above the competitive level *for a significant term*⁴. In definitions with regard to market power in general emphasize is laid on the

³ OECD (2005). "Competition Issues in the Electricity Sector." OECD Journal of Competition Law and Policy 6(4): 81-181,p. 84.

⁴ This term is conventionally shall last more than one year.

capability of a firm with market power to increase the market price *in a profitable manner* by restricting generation capacity or increasing its own price⁵.

It may be seen that in the regulation texts of the European Union with regard to the telecommunication industry the concept of “Efficient Market Power” is defined closely to the concept of “dominant position”. According to this definition, a firm enjoying market power, is capable of acting independently from its competitors, customers and end users, by its own or together with others⁶.

The two components emphasized in the abovementioned definitions, i.e. the power of increasing the price for a significant term and in a profitable manner, must be assessed in a very different way, if an electricity producer is at issue. For example, let us suppose that prices increase, when an electricity producer shuts down its generation facility. In order to acknowledge, whether such a situation is profitable for the producer, we have to investigate, whether such producer owns other power plants, and on which conditions electricity is supplied to the market from these power plants. If the other power plants may immediately respond to the missing part of the market demand and sell electricity to the market at high prices through the “equalization market”, shutting down the first power plant may be profitable. This example makes us assume that instead of the term of minimum one year, which is sought in other industries for becoming able to make use of their market power, a term of a few months will be sufficient.

Another peculiar situation that arises at this point is whether the power plant has been shut down *for the purpose of* making use of the market power, or because of being required to do so. Power plants may be withdrawn from operation because of defects or for maintenance. Nevertheless, it may be measured by statistical methods, if the plant has been shut down significantly at the time when prices increased.⁷

As it will be defined in the following section with regard to biddings, although it is expected that in Turkey the electricity market will clean itself essentially by supply agreements between the producer and the distributor, the realization of electricity demand above or below the supply to a great extent, gave rise to the necessity of cleaning the market by biddings for loading or unloading.

The formation of wholesale electricity markets under such a demand pressure will cause that prices become influenced excessively by variables like local and regional weather conditions (for example hot weather or storm), the non-operation of power plant unplanned, restrictions in transmission, withdrawing generation capacity from operation due to market conditions, etc., and increase to an abnormal amount within a short term. While the first three causes arise from the physical properties of the system, the last component is a strategic company behavior to increase the price and turnover.⁸

Pursuant to Article 6 of the Law No. 4054 on the Protection of Competition, preventing competition by using market power is prohibited. In the text of the said Article, the expression “abuse of dominant

⁵ In competition literature this is an example of the abuse of dominant position by reducing the price below the average variable cost in order to prevent new entries to the market, which is called predatory pricing.

⁶ European Council Directive 2002/21/EC of 7 March 2002 on a common regulatory framework for electronic communications networks and services (Framework Directive) Official Journal of the European Communities.

⁷ Paul Twomey, R. G., K.Neuhoff, D.Newbery (2005). "A Review of Monitoring Market Power: The Possible Roles of TSO's in Monitoring for Market Power Issues in Congested Transmission Systems." Center for Energy and Environmental Policy Research 05-002 WP, p. 6.

⁸ Hudson, R. (2000). "Analysis Of Uniform And Discriminatory Price Auctions In Restructured Electricity Markets." <http://certs.lbl.gov/pdf/ornl-pricing.pdf>. p. 2.

position” is used, and such a behavior is prohibited. However, the concept that has been defined above as market power, is nothing else than dominant position, which is a legal concept. Besides, pursuant to the Competition Law, the Regulatory Authority takes action automatically against enterprises abusing dominant position, upon any notice, complaint or the request of the Ministry of Industry and Trade. If at the end of the process of investigation, which lasts about one or one and a half year, it has been determined that the relevant enterprise abused its dominant position, it is punished with an administrative fine of up to 10% of its turnover in the precedent fiscal year. The fine will become due 3 months after the delivery of the reasoned decision, and taking any legal counteraction before the Council of State, which in this case is the court of appeal, does not cease the payment of this fine⁹.

1.2. Measuring Market Power in the Electricity Industry

In line with liberalization of the electricity markets and the occurrence of competition infringements in these markets, several researchers began to claim that the traditional measuring criteria for relevant market and market power are not applicable to the electricity industry.¹⁰ The authors specify that using the SSNIP test¹¹ to determine the relevant market, and the HHI¹² values to determine the concentration scale will not be meaningful for the electricity industry, since the transmission network will be more complex after having been opened to immediate access by other countries and other regions, and due to specific properties of the industry.

Differently from other industries of the economy, the relationship of the market power of the wholesale electricity market to the market share of the relevant firm is rather weak. The most important variables determining market power in this market is to what extent the demand in the system exceeds the generation volume at a certain moment, the reserve capacity of the system, and how this capacity is allocated among the producers.¹³

That electricity producers are bound to capacity limits causes that the supply curve of the industry takes an intermittent shape. Let us examine an example, where four electricity power plants with totally different capacity and cost structures are present on the market. The first power plant shall generate electricity with a marginal cost of 10 US\$ and belong to a capacity of 100 Megawatt (MW). For the second and third power plants the marginal cost shall be 15 US\$ each and their capacity shall be 60 MW each, and for the last power plant these values shall be 30 US\$ and 80 MW. If demand is

⁹ For more information on Competition Law and its implementation see Aslan, Y. (2005). *Rekabet Hukuku*. Bursa, Ekin Kitapevi.

¹⁰ See Rajat Deb, R. M., S. Deb "Transmission Capacity and Market Contestability in the Midwest Interconnect." *LCG Consulting Report*.

http://www.energyonline.com/Reports/ViewReport.aspx?ReportID=55&Transmission_capacity_and_market_contestability_in_the_Midwest_Interconnect

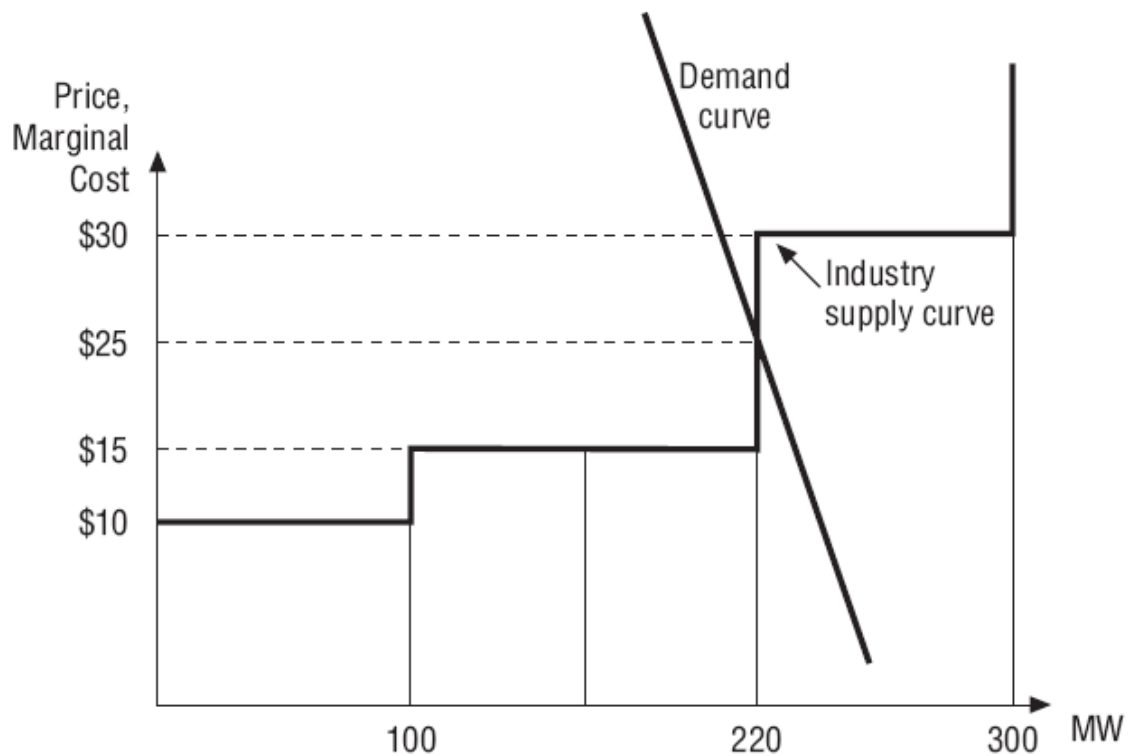
¹¹ SSNIP Test: (Small but significant non-transitory increase in price) The relevant market definition method that is criticized because its application is almost impossible. ÇETİNKAYA (p. 12) defines this test as follows: “According to the SSNIP test, if an enterprise that is classified as monopoly, makes a small, but significant non-transitory increase in the price of a certain product¹¹, and thereby causes that consumers tend towards other products, and as a result of this situation the increase in price is not profitable, this will mean that the product produced by the firm and the product towards which consumers tend, takes place within the same market. In this context, it may be said that a relevant product market covers all products ensuring the conditions of the SSNIP test. While the product market so determined will comprise all other rival products that may be substituted in the best manner, it will not comprise any other product that might display the market wider as it is.” (The relevant market concept will be touched upon in the section with regard to mergers).

¹² The Herfindahl-Hirschman Index is equal to the total of squares of the shares of the firms in the market. By this way, the market shares of the firms are weighed by being multiplied by their own shares. In the Horizontal Merger Guide of the U.S. Department of Justice and the Federal Trade Commission, the impact of a merger or a takeover is measured by this index. If after the merger an index between 1000 and 1800 occurs and the merger index increases more than 100 points, or an index exceeding 1800 increases by more than 50 points by merger, the competition authority will start an investigation. Examining the industries in Turkey, it will be seen how low these figures are as to be accepted as meaningful thresholds.

¹³ Seth Blumsack, p. 18.

positioned in this market, which will find its equilibrium at the point where the demand and supply curves will intersect, as defined in the following graphic, the price will be above the price all producers will be ready to offer. The point is that this high price (25 US\$) exceeding marginal costs is not based on any use of market power by any firm.¹⁴

¹⁴ Biggar, D. (2005). "Competition Issues in Electricity Sector." OECD Journal of Competition Law and Policy 6(4): 92-162,p. 102-103.

Figure 1: Intermittent supply curve derived from power plants with (Biggar 2005, p.102)

Therefore, the linkage between market structure and performance is cut off, and thus, the power of the HHI index, providing an idea about the size distribution of firms and concentration of the market, on giving information on whether the market acts similar to market with lack of competition, disappears.

Let us assume a realistic example where a part of the producers in the market use their entire capacity, but certain large producers do only use a part thereof. Small power plants using their entire capacity will not be able to react to an increasing price because of an increase in demand. Therefore, large power plants which are far from the capacity limit in given demand level will compete with each other, and face a residual demand curve from which the generation volume of small power plant have been deducted. This requires that the relevant market is determined not only by taking into consideration time (whether or not peak time), but also the quantity of demand.¹⁵ While the market is competitive in low demand levels, in case that the demand volume exceeds a level that causes small scale power plants to use their entire capacity, the market remains with large scale power plants. Therefore, Biggar suggests that the following **adjusted HHI index** should be used¹⁶.

$$HHI^{adj} = \sum_{i=1}^n s_i \left(s_i + \frac{\bar{s}}{n} \right)$$

¹⁵ Ibid. p. 109.

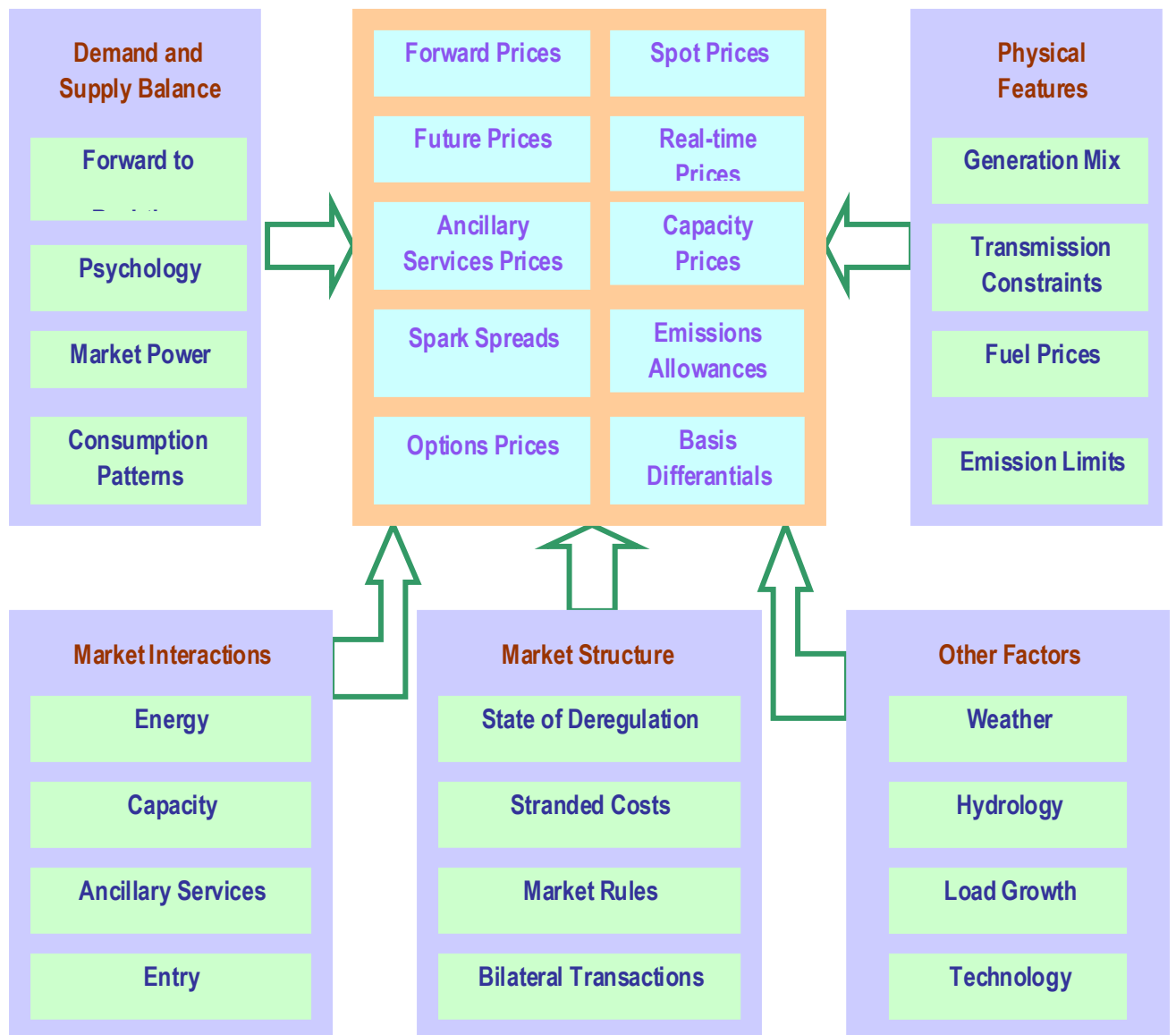
¹⁶ Ibid. p. 111.

In this formula, s represents the market share of the capacity constrained firms; n represents the number of unconstrained firms, and \bar{s} is the total market share of constrained firms. Biggar displays in the examples given that the corrected HHI in markets with a capacity constrain problem, reflects the pricing power¹⁷ above the marginal costs of the firms in a proper manner.

In the electricity industry price formation is not only bound to concentration in the market; several variables shown in the following figure influences the price of several services in the electricity market. Accordingly, by using both market power, and under the control of mergers and takeover, which will be examined in the following section, assessment only on base of market shares and concentration ratios will cause faulty results.

¹⁷ This power is measured by Lerner Index.

Figure 2: Price Formation in the Electricity Industry (Deb, p.3)



2. Control of Mergers and Takeovers in the Electricity Industry

Article 7 of the Competition Law prohibits merger, takeover or establish any partnership “aimed at creating a dominant position or strengthening their dominant position, as a result of which, competition is significantly decreased in any market for goods or services within the whole or a part of the country...” Pursuant to Article 11 of the same Law, any transaction exceeding 20 million YTL and a market share threshold of 25% have to be notified to the Competition Board in order to render such transactions valid.

2.1. Relevant Market

While assessing the impact of a merger on the competition in the market, first the borders of the market that will be effected are drawn. The market where competition conditions are homogenous, and product or products may be substitute with each other by the buyer due to properties like price, quality or purpose of use is called the relevant product market, and the geographical region, which is effected thereby, is called the relevant geographical market.¹⁸ Whether the competition in the relevant market consisting of these two components is effected negatively by mergers shall be assessed according to the approach of the competition authority either on its impact on the *market structure*, or *performance* indications like market price, volume, the possibility of prearrangement, etc. Accordingly, the methods to draw the borders of the relevant market will affect the final decision of the competition authority. While assessing whether the market power is used, first the relevant market has to be determined.

The relevant market is determined on base of the activities of the merging parties. That means, if the owner of a power plant purchases another power plant, the market to be defined shall be in relation with electricity generation. The merger of two regional electricity distributors requires the product market as electricity distribution service at the first glance.

The 1st Directorate of the Turkish Competition Authority defined the relevant markets in its opinion on the privatization of TEDAS, the former distribution monopoly, dated 27.5.2005, as two product markets: Electricity distribution service and retail electricity sales. The relevant geographical market has been determined as to form each distribution region separately. However, when the new market design has put into operation and merger transactions become more complex, it will be more difficult to define the relevant market.

That at certain seasons and hours congestions may occur because the transmission service capacity is limited, will render the assumption invalid that two power plants at different ends of the country might be competitors, whereas such an assumption might give rise to doubts about the interconnected structure of the system. By this way, not only for distribution, but also for generation services regional markets must be defined. As defined above in the section with regard to the measuring of market power, these markets may be multiplied not only with regard to different hours of the day or different seasons of the year, but also to different levels of demand.

Similarly, in agreements concluded between electricity power plants and distributors or eligible customers, the fact that unit prices display apparent differences among regions, is a reason for determining markets being defined for generation at a regional base. In loading/unloading markets, the occurrence of behavioral differences between large scale and small scale power plants, will cause that these markets are taken into account while determining the relevant market.

Due to several causes like those listed above, the determination of the relevant market in the electricity industry is a discussion that will not come to an end easily. Moss summarizes the transactions that she recognizes as problematic, and the polemic issues with regard to the definition of the relevant market in intensive electricity mergers occurred in the USA in the last years in the following table¹⁹:

¹⁸ For a detailed work on the concept of relevant market in Turkish, see. Çetinkaya, M. (2003). İlgili Pazar Kavramı ve İlgili Pazar Tanımında Kullanılan Nicel Teknikler. Ankara, Rekabet Kurumu Yayınları.

¹⁹ Moss, D. (2005). "Electricity Mergers, Economic Analysis, and Consistency: Why FERC Needs to Change its Approach." *American Antitrust Institute Working Paper 04-02*, p. 13.

Table 1: Electricity Mergers with Problematic Market Definition in the USA

Merging Parties/Type of Merger	Date and Location	Controversial Issues
Baltimore Gas & Electric and Potomac Electric	1997 Mid-Atlantic	Accounting for transmission constraints in geographic market definition; measurement of capacity.
Delmarva Power & Light and Atlantic Energy	1998 Mid-Atlantic	Time-differentiating demand in product market definition.
Nevada Power and Sierra Pacific	1999 West	Measurement of transmission availability in geographic market definition.
Northern States Power and New Centuries Energy	2000 Midwest	Isolating merger-related changes in market concentration from PUHCA-required integration of utility systems
Carolina Power & Light and Florida Progress	2000 South	Measurement of transmission availability, transmission allocation, and market prices in geographic market definition

As it may be seen from this table, especially due to failures in transmission services at certain times, the narrow definition (or non-definition) of the geographical market is a matter of discussion.

In the merger and takeover investigations of the EU Commission in 2003 and 2004 in the electricity industry, the relevant geographical market has been defined by limiting it to national markets, but from these decisions it may not be understood in which cases the definition of a market will occur, which passes beyond the borders.

From past decisions the following criteria may be drawn while determining the relevant geographical market:

- An interconnected capacity below 10% of the national consumption is insufficient to determine a market that is wider than the national borders, but a capacity above 25% will be sufficient,
- A congestion of 25% in transmission is too much to determine a market that is wider than the national borders, but a ratio of 5% may be acceptable,
- Price differences exceeding 10% will be sufficient to determine a wide market²⁰.

²⁰ M.2947 Verbund/Energie Allianz (2003), M.3268 Sydkraft/Grønting (2003), M.3440 ENI/EDP/GDP (2004).

Nevertheless, Vandezande criticizes these criteria by claiming that measurements and interpretations made according to these criteria are far from transparency.²¹

As the markets that should be laid stress upon, researchers examining the USA example emphasize on non-firm electricity that must not be sold by short term capacity, long term capacity and short term agreements.²²

2.2. Assessment of Mergers

When the EC Directive No. 4064/89, which has been published in 1989 and determines procedures and principles with regard to the assessment of mergers and acquisitions being made in the scale of the European Union has been renewed by the Regulation No. 139/2004, instead of the assessment criteria called the “dominance test” the criteria of a “competition test”²³ has been adopted. The dominance test, which takes place in Article 7 of the Competition Law No. 4054 as well, prohibits formation of a dominant position or strengthening of an existing dominant position. However, the competition test is interested in whether the transaction to be performed reduces competition to an important extent, and does not require the creation of a dominant position as a precondition.

Accordingly, in line with the new test, transactions that reach a total market share below the minimum market share of 40%, which is sought for the determination of dominant position by the EU, will be prohibited in the European Union.²⁴ Establishing a similar understanding in Turkey requires amendments in the Competition Law. However, there is no hindrance for the Competition Board to decide with regard to transactions in the electricity industry that despite low market shares periodical dominant positions arise due to the properties of the market.

The disadvantages that may arise from using HHI values in the electricity industry as an indication for a competition distorting market structure, differently from other industries, and how these disadvantages may be removed, has been explained in the section “Market Power”. Researchers are claiming that computer simulations should be implemented, since corrected HHI values will not be sufficient due to the fact that they do not provide that the strategic coordination between the enterprises in the market is displayed.²⁵ Similar simulations are used for the determination of the relevant market as well.²⁶ But there are critics that these models do not work properly, and depend on assumptions, which validity is in doubt.²⁷ As it may be understood, it is impossible to speak from a single proper assessment method being agreed upon.

The assessment of mergers and takeovers in the European Union and the U.S. exhibit a portrait changing in time. The reason for these changes is that the public authorities learn their lessons from the negative results of the market structure that occurs after former experiences and take into consideration both continuously developing measuring methods and theories based on such methods.

²¹ L. Vandezande, L. M., Bram Delvaux, Geert Van Calster, Ronnie Belmans (2006). "Evaluation of Economic Merger Control Techniques Applied to the European Electricity Sector." *The Electricity Journal* **19**(6): 49-56, p. 51.

²² Surratt, W. (1998). "The Analytical Approach to measuring Horizontal Market power in Electric Utility markets: A Historical Perspective." *The Electricity Journal*: 22-33, p. 27.

²³ In some sources referred to as SLC (significant lessening of competition) test.

²⁴ As defined in the section with regard to use of market power, a power plant belonging to a market share of 20% may prevent competition by using its market power.

²⁵ Moss, p. 11; Deb, p. 4; Vandezande, p. 54.

²⁶ For an idea on the models used see M. Ventosa, A. B., A. Ramos, M. Rivier (2005). "Electricity Market Modeling Trends." *Energy Policy* **33**: 897-913.

²⁷ K. Neuhoﬀ, J. B., M. Boots (2005). "Network- constrained Cournot Models of Liberalized Electricity Markets: the Devil is in Details." *Energy Economics* **27**(3): 495-525.

The process of liberalization in the electricity industry in the EU started with the publication of the first electricity directive (96/92/EC) in 1996. The principal purpose of the Directive, which ensured a transition to a competitive structure especially in generation and supply, and passing beyond national borders, was to establish an internal energy market to be owned by the EU. Within a structure where the interstate energy transfer capacity is limited and existing firms are national and in general in a dominant position, this seemed to be a purpose, which was hard to achieve²⁸. Since firms were in a dominant position, their mergers and takeovers on a national scale was contradicting with competition, but since they gained 2/3 of their revenues from a single country, they could not be subjected to the supervision of the EU Commission.

By the reports²⁹ published in 2005 with regard to the creation of an internal market in electricity and gas³⁰ and investigations in the industry, the EU Commission declared that the liberalization attempts, which were continued with the Second Electricity Directive (2003/547/EC) and the Regulation No. 1228/2003 did not achieve the above-mentioned goals. Firstly, concentration in the market was still high. The CR(3) ratio, which represents the total market share of the largest three generation companies was above 65% in most of the EU member states. The strong positions of existing companies could not be convulsed by newly entering companies. Secondly, a consolidation in a European scale was experienced: National market leaders entered neighbor markets by large acquisitions and increased the need for cross-border competition.

Within this continuing merger wave, certain member states governments still keep national interest at the first place. The acquisition of EON in 2002 by Ruhrgas has been prohibited by the German federal competition authority Bundeskartellamt, and the proposal of Endesa for Gas Natural in 2006 has been prohibited by the Spanish authority Tribunal de la Competencia. Nevertheless, although being apparently contradicting to competition, both takeovers, which remained below the threshold of the Commission, have been realized by the intervention of the relevant governments in order to support the “strategic importance of the industry” and the “national champions”. This situation revealed that the existing merger/takeover legislation of the EU do serve neither the purpose of ensuring competition, nor creating an internal, and that as long as the 2/3 rule is not changed a common EU electricity policy is not possible.³¹ The reactions of the French and Spanish governments, respectively, to the purchase proposals from EON to Endesa, and from Enel to Suez in 2006, displays that the protective wave still continues.³²

Despite all these developments the EU Commission both aggravated its approach to mergers in the industry, and implemented the provisions of Article 81 of the Treaty of Rome prohibiting competition restricting agreements, and Article 82 prohibiting the abuse of the dominant position.

Examining the merger/takeover policy applied in the USA reveals that the problem with regard to the “horizontal integration” arising from the merger of gas transformation plants and electricity producers and the concentration of transmission services in the hand of a single firm is carefully approached.³³

²⁸ Ibid. p. 28.

²⁹ EU Commission, *Preliminary Report Sector Inquiry under Article 17 Regulation 1/2003 on the Gas and Electricity Markets*, 2006, <http://europa.eu.int/comm/dgs/competition>.

³⁰ EU Commission, *Report on Progress in Creating the Internal Gas and Electricity Market*, Communication from the Commission, COM(2005) 568, <http://europa.eu.int/comm/energy/>.

³¹ Leveque, p. 28

³² Vandezande, p. 50

³³ Moss, p. 11

Table 2: Mergers conditionally approved by FERC or challenged by DOJ / FTC (Moss, p.11)

Merging Parties	Date, Type and Location	Agency Taking Action	Competitive Issues and Remedy
Ohio Edison/ Centerior	1997 Electric-Electric Midwest	FERC	Issues: Transmission foreclosure Remedy: Transmission priority, transmission capacity allocation, and price cap requirements, “expectations” that the merged company would relinquish control of its transmission to an Independent System Operator
Pacific Enterprises/ Enova Corp.	1998 Electric-Gas West	FERC and DOJ	Issues: Gas transportation foreclosure, deterrence of generation entry Remedy: Same-time pipeline capacity disclosure requirements (FERC) and divestiture of two gas-fired generators (DOJ)
PacificCorp/Energy Group PLC (Peabody Coal)*	1998 Electric-Coal West	FTC	Issues: Raising rival’s costs, deterrence of generation entry Remedy: Divestiture of coal mining properties, prohibitions on inter-affiliate transfer of non-public coal customers’ information
CMS Energy/ Panhandle Eastern	1999 Electric-Gas Midwest	FTC	Issues: Gas transportation foreclosure Remedy: Pipeline to pipeline interconnection requirement
Dominion Resources/ CNG	2000 Electric-Gas Mid-Atlantic	FTC	Issues: Gas transportation foreclosure, Deterrence of generation entry Remedy: Divestiture of gas distribution assets
American Electric Power/ Central and SouthWest	2000 Electric-Electric Midwest	FERC	Issues: Transmission foreclosure Remedy: Market monitoring, obligation to join an RTO, divestiture of generation
DTE Energy/ MCN Energy	2001 Electric-Gas Midwest	FTC	Issues: Lessening of competition between centrally supplied electricity and self-generation Remedy: Easement over portion of gas distribution capacity

Koch Industries/ Entergy	2001 Electric-Gas South	FTC	Issues: Regulatory evasion Remedy: Transparency requirements for gas procurement
* The merger was not consummated -- another firm eventually purchased Peabody Coal			

2.3. Is there any need for a different merger/takeover policy for the electricity industry?

Considering a general assessment, possible faulty decisions that might be taken by the Competition Board while investigating mergers/takeovers may be collected in two groups:

1. Prohibiting a concentration transaction although not contradicting with competition,
2. Permitting a merger/takeover contradicting with competition.

In the electricity industry, where the price flexibility of demand is rather low³⁴, the Competition Board will have to be more sensitive against the second type of faults. In this industry where in the face of price increases, neither consumers, nor electricity distributors may reduce their purchase volume to the same extent, on consumers the negative impacts of using the market power that will occur as a result of mergers contradicting with competition, will be higher. At the other hand, on consumers the impact of prohibiting concentration transactions that do not create any dominant position (Type 1 error) will be less, and one will be deprived of the possibility that increase in efficiency arising from the growth of the scale might cause a fall in prices. Leveque states that only in 15% of the transactions the targets were achieved, which had been foreseen during the merger of power plants in the USA, and approaches the possibility that mergers might create positive effects with doubt³⁵.

That the gap between the social costs arising from the fault type 1 and fault type 2 in the electricity industry, is rather deep, requires the Competition Board to be "harder" while assessing mergers/takeovers. The difficulty in determining abuse of the dominant position reduces the power and deterrence of *ex-post* interference.³⁶

The fact that the relation of market power to market share is rather weak in the electricity industry raises the probability that the Competition Board, which assesses mergers and takeover transaction essentially on base of market shares, takes faulty decisions with regard to concentration transactions.

³⁴ A study made on consumers living in the USA it had been calculated that increasing the price of electricity one times decreases demand by 7% to 20%, i.e. price flexibility in the short term is between -0,1 and -0,3. Blumsack, p. 21

³⁵ Leveque, F. (2006). "Antitrust Enforcement in the Electricity and Gas Industries: Problems and Solutions for the EU." *The Electricity Journal* 19(5): 27-34, p. 29. Anderson, J. (1999). "Making Operational Sense of Mergers and Acquisitions." *The Electricity Journal* August-September: 49-59.

³⁶ Leveque, p. 29

3. Preventing Competition In Electricity Markets By Collusion

During the “California Electricity Crises” in 2000 in the United States it had been seen that after the liberalization of the market, firms being formerly engaged in activities at regulated prices might conclude concealed co-operations restricting competition. Within January 2000, electricity prices increased in the average from 3,5 cent/kwh to 40 cent/kwh, and at peak times prices of 1.50 US\$ had been seen. Producers, which were capable of meeting the demand of 40 thousand MW in the precedent year, put forward at a demand level of 30 thousand MW after liberalization that they had to carry out maintenance work on the power plants³⁷. The US Energy Department declared that during summer 1998 and 1999 producers were made a payment of 800 million US\$ above the competition level, due to their use of market power³⁸.

Increasing (or decreasing) prices by restricting supply (demand) by way of expressly or concealed agreement is prohibited pursuant to Article 4 of the Competition Law. This prohibition is intended for preventing that firms distort the operation of the market, which is aimed at being operated in a competitive manner, by agreements made between firms. Since making an agreement restricting competition has been prohibited by legislations passed in the USA in 1890, in the European Union in 1957 and in Turkey in 1994, firms make their competition restricting cooperation mostly not expressly, but concealed and sometimes without having to communicate with each other³⁹.

If the common decision-making of the little number of firms that occur in liberalized markets is not punished in a hard manner, none of the utilities, which are expected from the new order, may be realized because of such cooperation, which are very hard to determine. Besides preventing the unilateral use of the market power defined above and the control of mergers/takeovers, fighting against competition restricting agreements is one of the important duties that has to be carried out by the Competition Authority to ensure that the electricity industry operates in a healthy manner.

By new arrangements it is foreseen that the wholesale electricity market in Turkey is essentially formed through long term supply agreements. Unlike most liberalized electricity markets in the USA and in Europe, bidding markets do not work as an essential mechanism, which joins power plants and distribution companies. That wholesale electricity prices are not determined in exchange-like markets, but through supply agreements provides a partial protection for distribution companies, which do not have the possibility to reflect on their customers any variable price in the market, against the use of market power by power plants against such distribution companies.

However, if in daily operation demand exceeds or remains below supply the part of the market that may not be balanced by supply agreements are tried to be balanced by *loading* and *unloading* biddings. In loading biddings, power plants that shall enter the market, and in unloading biddings, power plants that shall exit the market are determined by so-called uniform price auctions.

This does not reduce the significance of biddings in the formation of electricity markets, but increases the importance of demand forecasts. If distribution companies, which are the demand side in the wholesale electricity market, do not precisely forecast, for the time being of supply agreements made with power plants, how much electricity customers in their own regions will demand on different hours of a day and at different months of a year, how this demand will change in time, the consumption volume will occur above or below the reasonable volume within the frame that has been

³⁷ Chip Cummins and Rebecca Smith, "Power suppliers see California lose its golden glow amid woes," *Wall Street Journal*, 25 Ocak 2001.

³⁸ Hudson, p. 5.

³⁹ This kind of cooperation is referred to as “concerted practice”.

determined by the supply agreement. In such a case, the contribution of biddings in the formation of the market will exceed the secondary role that has been prescribed to it by the legislator.

In this section we will focus on a special field of cooperation between firms that is likely to occur in the electricity market, i.e. the operation of bidding markets. It will be emphasized that the bidding system should be designed in such a manner as to not permit behaviors outside competition, like pricing by prearrangement, predatory pricing and entry barriers for competitors. Although it is outside the scope of our main subject, in markets arranged for allocation of distribution licenses, which may establish monopolies, the competition theory is another issue to focus on.

3.1. Considerations with regard to Design of Biddings

Due to a belief that is now rendered more concrete by the enactment of the Public Tender Law, but still fails its material fundamentals, in Turkey the bidding system is considered as a way to sell or purchase a product in the most advantageous manner. However, what is not taken into consideration is that being capable of operating biddings in such a manner as to imitate a competitive market depends on the performance of certain sensitive conditions at the same time. Therefore, establishing a bidding system for a market to be created may result in a failure due the occurrence of unexpected impacts. While even for the simplest markets several uncertainties are present, structural justifications like the fact that the electricity volume to be loaded to the system is stochastic, the security of the system must be provided, the change of transmission costs as to its destination, will cause that the market performance occurs below the expected level.⁴⁰

To ensure that the electricity market becomes more efficient, that means reaches a less cost-effective equilibrium, the regulatory authority regulating the market must be aware of the marginal costs of the power plants, the properties of the transmission network and the structure of demand as well as its sensitivity against prices. In non-liberalized traditional electricity systems, this situation does not cause any problem for generation, transmission and distribution, since they work in a vertically integrated structure. However, when these parts are unbundled from each other and a competitive market is foreseen, market information will not be open to everyone.

To provide that the market operates in a competitive manner, the cost of producer has to be known by the buyers. Attempts may be made to get the information (signal) on what these costs will be from the proposal of the producer to be submitted at the bidding. But, since expecting producers to disclose their costs is contradicting with their profit maximization goal, it will be meaningless. Therefore, it should be tried to design the bidding system in such a manner as to encourage the producer to submit a price as close as possible to cost.

3.1.1. Preventing collusion

It is expected that the firm is awarded with a bidding to be organized for the sale of distribution licenses, which expects the most profit and therefore submits the proposal with the highest prices. A bidding in the form of an open auction, where several licenses are sold at the same time gives rise to the possibility that participants might give each other signals with their bids as not to raise prices or if there are several biddings, as to share the biddings. Klemperer states that in the frequency auctions in 1999 in Germany, with its proposal, Mannesman successfully gave T-Mobile a message as not to raise price, but share the auction. The author claims that this kind of a bidding design, where several products are sold at the same time, will fail, since it gives firms the chance to punish firms not accepting an agreement proposal, by raising prices in all auctions⁴¹.

⁴⁰ Robert Ethier, R. Z., Timothy Mount (1997). Auction Design for Competitive Electricity Markets. HICSS Conference, Cornell University, Hawaii .p. 2

⁴¹ Klemperer, P. (2004). Auctions: Theory and Practice, Princeton University Press.p. 105.

In loading biddings producers submit their capacity volume they are ready to put into operation at each price level, in a manner that other producers are not able to see their proposals. The bidding is finalized on base of the lowest price and all proposals submitted are independently made at this price. This system, which is called a **uniform price auction**⁴², is a method that is also used frequently in foreign markets in order to balance wholesale electricity markets.

Uniform price auctions are preferred, since they provide that several units of the product are awarded by bidding to several sellers. Volumes proposed by producers at a certain price level represent the maximum volume they intend to sell. Accordingly, not processing the entire proposal, but only the part meeting demand, will not distort bidding. The price awarded is the price of the first proposal block buyers agree to purchase. That means, each of the producers being awarded with the bid gain the right to sell their own proposal figures at a price exceeding their scale. Therefore, it is assumed that a producers, who submits a proposal exceeding marginal cost, will submit the proposal pot to cost because of the fear of losing the bidding, and that this figure will make sales on base of a scale. However, this beautiful theoretical justifications claiming that uniform price auctions ensure that the right signal is given with regard to the marginal cost of producers, unfortunately did not made the expected impact in practice⁴³.

In uniform price auctions, firms with a market power have the chance to raise the market price. Let us suppose that a firm with market power owns two power plants with different capacity and cost structure. Withdrawing the power plant with higher cost from operation will cause that the price awarded will rise to the next scale, if the sales price proposed for the electricity of this power plant was the first price that had been refused by the buyers. Even if it is not possible to say in advance, whether in practice raising prices will be possible, a healthy operation of the market given in this example is only possible by new entries in the market, by putting into operation new capacities of other producers working with missing capacity, or by interference of the Competition Authority.

Uniform price auctions may fail as well, when there is cooperation between firms. If power plants intend to prevent that prices fall below a certain level by sharing their generation capacities among each other, they have to ensure for the continuity of this partnership, which is competition-restricting, that all participants abide their agreements. The other companies might develop deterrent methods against any firm, which tries to sell more electricity than the quota in uniform price auctions. If firms, which submit a rather low sales price for proposals with a lower volume than their own share will cause that the firms submitting a proposal exceeding the agreed quota not only gain a low price for the part exceeding the quota, but for their whole sales. If all firms keep their proposals limited with their own quota, nobody would be forced to make sales at such low prices, and transactions are made at the agreed price in the agreed quotas. Thus, deterring from the agreement will not be profitable, if the total volume to be supplied by the participants is definite.⁴⁴

Moreover, the fact that biddings are made frequently facilitates that participants give each other messages as to their intent and strategies for punishment. The difficulty of determining and punishing such competition infringements at the one hand, since rules to be imposed for submitting proposals, in order to prevent collusion, will result in inefficiency and reduction of flexibility, a better bidding design should be intended⁴⁵.

Ofgem⁴⁶, the regulatory authority of the United Kingdom, announced in 1999 that it believes that the electricity market operating under the uniform price auction system, where distributors purchase

⁴² For detailed information on uniform price auctions, see Feldman, R., R.Mehra. 1993 "Auctions: A sampling of techniques." *Finance & Development*, Volume 30, Issue 3:32.

⁴³ Ethier, p. 6

⁴⁴ Klemperer, p. 105

⁴⁵ Ibid.p. 106

⁴⁶ "The Office of Gas and Electricity Markets".

electricity from the producers, was sacrificed by such a concealed agreement system, which restricts competition: "Far from being the success story trumpeted around the world, the story of the UK generation market and the development of competition has been something of a disaster."⁴⁷ Therefore, in March 2001 in England and Wales in line with other reforms, a transition from the uniform price auction system to a discriminatory price auction system has been made.

Some researcher claim that applying a discriminatory price auction instead of a uniform price auction, because of the problems connected therewith will be more effective and less cost-effective⁴⁸. In this kind of auctions, the method of determining the firm to be awarded with the bidding is still the same as with uniform price auctions, the difference is that each seller being awarded with the bidding must perform its sales at its own proposed price. On the other hand, buyers are paying the weighted average of the proposals of the producers. As it may be remembered, as a result of uniform price auctions, transactions were made at a single price.

Since one single power plant will determine the payment value for all power plants, in uniform price auctions participants are not forced to submit their proposals at the scale of their marginal cost. As a result thereof, in uniform price auctions zero price proposals may be observed in order to guarantee the chance of being selected. Since in discriminatory price auctions, the revenue to be obtained will be directly connected with the proposal, each firm is required to submit a proposal being prepared more carefully⁴⁹.

Besides defenders of the efficiency of discriminatory price auctions, in the literature also articles may be seen, which claim that uniform price auctions with corrected transmission costs will render – at least theoretically – better results, since they eliminate the motivation of the producers to disclose their real costs. Despite the claim of Klemperer, as defined above, that uniform price auctions might cause concerted practice, Kahn⁵⁰ refuses the idea that transiting to discriminatory price auctions will create more competition and lower prices⁵¹.

3.1.2. Comparing Bidding Systems on base of sample market modeling

It will be helpful for the determination of the ideal bidding system to mention the results of the market simulation made by Oak Ridge National Laboratories (ORNL) in line with the Consortium for Electricity Reliability Technological Solutions (CERTS) in order to reveal different market mechanisms. This computer based model called the ORNL Electricity Market Model, follows the scenario of meeting hourly electricity demands by way of bidding, by power plants with different types of fuel and capacity. In this model, by way of bidding payments are not made only for the electricity itself, but also for *ancillary services* like transmission and system operation. The model calculates for each market variable costs for different power plants, and the payments made for each unit of electricity generated by them⁵².

⁴⁷ Klemperer, p. 106

⁴⁸ Mount, T. (1999). Market Power and Price Volatility in Restructured markets for Electricity. IEEE Proceedings of the Hawaii International Conference on System Sciences, Hawaii .

⁴⁹ Hudson, p. 5.

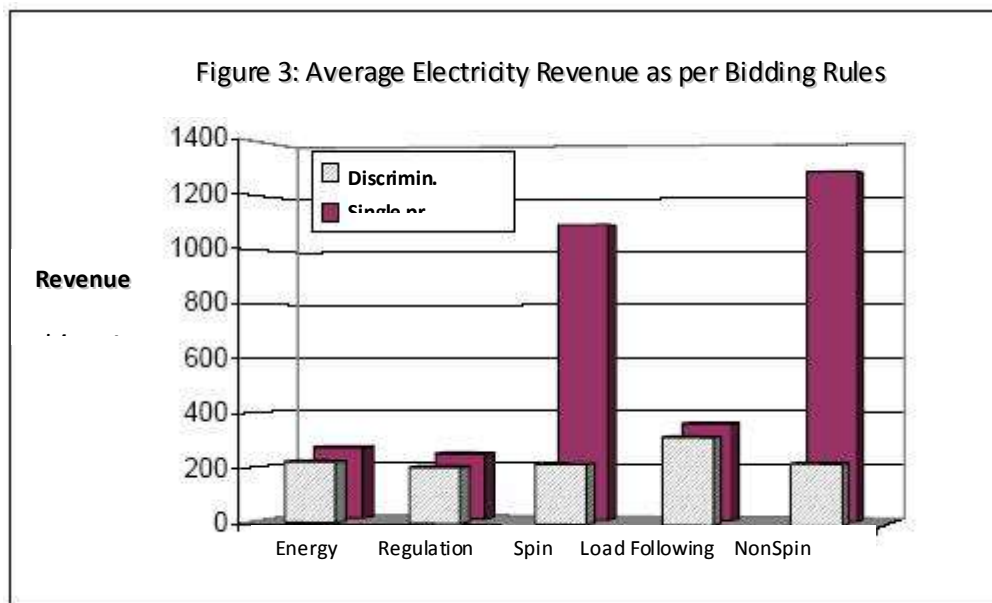
⁵⁰ A. Kahn, P. C., R. Porter and R. Tabors (2001). "Uniform Pricing or Pay-As-Bid Pricing: A Dilemma for California and Beyond." Electricity Journal(July): 70-79.

⁵¹ For the list of articles taking place in the literature with regard to which of discriminatory/single price biddings are more efficient see Natalia Fabra, N.-H. v. d. F., David Harbord. (2002). "Designing Electricity Auctions: Uniform, Discriminatory and Vickrey." http://www.ksg.harvard.edu/hepg/Papers/Fabra-Fehr-Harbord_Elec.auctions_11-9-02.pdf.

⁵² For information on ORNL see Hudson, R. (2000). "Analysis Of Uniform And Discriminatory Price Auctions In Restructured Electricity Markets." <http://certs.lbl.gov/pdf/ornl-pricing.pdf>.p. 3-4

In order to obtain cost results, the ORNL Electricity Market Model has been designed as to simulate markets with a yearly energy demand of maximum 50 thousand MW, and has been used to obtain representative results with regard to behavior and scales of large and multiple plant fields of control with a broad generation mix.

As defined in the foregoing, abnormal price behavior occurs when the system faces a high demand. In this analysis, it is assumed that at the peak time the system load factor reaches to 94%. In addition to an energy demand of 48.700 MW, an ancillary service demand of 500 MW separated for regulation, 1150 MW separated for spinning reserve⁵³, 1000 MW separated for load monitoring and 500 MW separated for non-spinning reserve⁵⁴ has been included in this model. Proposals for each power plant are given on base of the marginal price expected for the relevant hour. In order to measure the existence of missing competition in the market, in the simulation it has been assumed that market power is used in spinning and non-spinning energy services. Certain bidders (including the last bidder) have selected to propose reserves of fifty times the generation costs of their own power plants for these services. It could be observed that the revenues and profits obtained in the uniform price auction, i.e. in the system where the last accepted proposal forms the price, was rather high compared with the discriminatory pricing rules, i.e. the rules of the system where each power plant is granted the price proposed by such plant. The result, i.e. average revenues of ancillary services, has been shown graphically in the following.



⁵³ *Spinning reserve* means the capacity that may be put into operation by decision of the system operator, and is generated by tools working synchronously with the electricity network, and which efficient current may be increased. Yann Rebours, D. K. (2005). "What is spinning reserve?." *Manchester Üniversitesi* http://www.umist.ac.uk/departments/mcee/research/Publications/uom-what_is_spinning_reserve-2005.pdf. Spinning reserve may be put into operating by notification of 10 minutes in advance, and may supply electricity for at least two hours. This term was derived from the turbines (spins) in hydroelectric power plants, which rotate without generating electricity in order to shorten the time of commissioning.

⁵⁴ *Non-Spinning reserve* means the capacity that may be withdrawn from into operation, if they are active, or put into operation, if they are inactive, within 10 minutes and remain for at least two hours in this condition.

Hudson states in his work comprising these results that uniform price auctions facilitate the use of market power, compared with discriminatory price auctions, in case that the market is shallow. Uniform price auctions reduce the transparency of price and give producers the chance to limit their capacity strategically. In the contrary, discriminatory price auctions, where each producer is bound to its own proposal, prevents participants from submitting strategic proposals⁵⁵.

Conclusion

One of the most important issues to be taken into consideration in the process of liberalization is that implementation of competition rules should not be left to regulatory authorities, but provided that they remain with persons with expertise and experience in matters like the impact of the type of competition infringement by undertakings and mergers/takeovers on oligopoly market structures.⁵⁶ That competition infringements may occur in several ways requires the appointment of experienced and healthy authorities with the authorization to make fast and comprehensive researches to determine such infringements. They should be prepared against several types of infringement, expressly or concealed, jointly or unilaterally, from submitting collusive prices at biddings to slow down maintenance of the power plants.

Since the negative impacts of undertakings with market power in the electricity industry is more intense compared with, for example, manufacturing, causes the necessity of both detecting market power, and detecting as well as preventing behaviors of abuse in time. The difficulty in realizing the latter requires that mergers and takeovers are handled carefully and more severe compared to other industries. Since on base of the present market structure and legal arrangements it is not possible to speak about “contested markets” in the electricity industry, adopting the *soft* approach displayed by the Competition Board against other industries also in the electricity industry will cause great negativities.

⁵⁵ Hudson, p. 6

⁵⁶ However, the non-committal attitude of the Regulatory Board in handling competition infringements in the telecommunication industry, which is an industry with another sector-specific regulatory authority, weakens our belief that liberalization will create a competitive market.