

## The Need for Revaluation of the Model Structure for Electricity Liberalization

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### *Abstract*

The question about an appropriate structure for the electricity industry has been extensively discussed in scientific literature and experts studies. Since the beginning of electricity liberalization, it was apparent for its promoters that such a structure (in this paper referred to as the *model structure* or *ideal structural model*) for the electricity sector should involve a separation of its four sub-sectors, i.e., generation, transmission, distribution, and supply. With the exception of transmission, each sub-sector should consist of many stand-alone type companies. Given the high degree of vertical and horizontal integration of the electricity sectors, their pro-competitive restructuring (i.e., de-integration) became a standard component of electricity sector reform packages. This paper provides a concise review of the origins and justification of the initial model structure for electricity liberalization, as well as an overview of the restructuring developments in the early years of electricity liberalization. Some attention is also devoted to the EU's unbundling initiatives. The core part of this paper discusses the first signs indicating the crisis of the initial structural canon. The paper concludes with some comments referring to the modified form for a model structure that is emerging. It involves vertical integration of generation and supply and allows a higher degree of horizontal concentration of the electricity competitive markets.

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## *Résumé*

La question de la structure de l'industrie de l'électricité appropriée a été beaucoup discutée dans la littérature scientifique et les études d'experts. Depuis le début de la libéralisation du marché de l'électricité, il était évident pour son promoteurs que cette structure (dans cet article elle est appelée "structure modèle") du secteur de l'électricité devra contenir la séparation de ses quatre sous-secteurs (génération, transmission, distribution et provision). A l'exception de la transmission, chaque sous-secteur devra contenir plusieurs entreprises indépendantes. Étant donné le haut niveau de l'intégration horizontale et verticale des secteurs de l'électricité, leur restructuration pro-concurrentielle (désintégration), est devenue un composant standard des paquets des reformes du secteur de l'électricité. L'article présente une révision des origines et la justification du modèle initial de la structure de la libéralisation du marché de l'électricité, aussi que la révision du processus de restructuration dans les premières années de la libéralisation du marché de l'énergie. L'article discute aussi les initiatives d'unbundling de l'UE. La partie la plus importante de l'article présente les premiers signaux indiquant la crise de la structure initiale. Finalement, l'article contient commentaires concernant la forme modifiée de la structure modèle qui émerge. Elle contient l'intégration verticale de la génération et la provision et permet le niveau plus élevé de la concentration horizontale du marché de l'électricité concurrentiel.

**Classifications and key words:** electricity liberalization, model structure, unbundling, internal electricity market, EU restructuring developments.

## 1. Introduction

In this paper the ideal structural model for electricity liberalization is treated as one of the key elements of the recommended standard reform package that was aimed at liberalization of the network industries, including the electricity supply industry. This package was based on the experience of the United Kingdom in transforming its network industries in order to make them responsive to the market type of incentives. It consisted of four elements: privatization; deregulation combined with setting out institutional arrangements required for development of competitive markets; re-regulation of the type of activities within each network industry that were characterized by strong natural-monopoly features and, finally; a restructuring component. The latter was to deal with the problem of the highly monopolized structure of network industries that had been dominant before their liberalization.

Given the high degree of the network industries' vertical and horizontal integration, their restructuring was perceived as a crucial factor in facilitating

the development and effective operation of competitive markets as well as in introducing regulatory mechanisms in those parts of each network industry where features of a natural monopoly still dominated, making effective competition impossible. For promoters of the network industries' liberalization, it was apparent that the restructuring component should involve various activities and efforts leading to vertical and horizontal de-integration of these industries. In the case of the electricity supply industry, its ideal structure model involved separation of the four sub-sectors, i.e. generation, transmission, distribution, and supply, with numerous stand-alone type companies within each of these sub-sectors (excepting transmission, where only one national-wide company was to operate). In the 1990s the above model became a recommended part of market-oriented reforms in other developed and developing countries.

Despite strong beliefs in its rationality and the increasing support of the European Commission for such a structural transformation of the electricity industry, the real structural changes that followed did not occur in the recommended direction. First of all, the restructuring component did not become a part of the liberalization reforms in a number of countries. Moreover, instead of the gradual de-monopolization that should accompany development of the electricity liberalization, the structural evolution of the electricity sector has in fact been going in the opposite direction. Since the end of the 90s, the pace of the industry's consolidation has been rapidly increasing. Through numerous mergers and acquisitions, the electricity industry has become more horizontally and vertically integrated than it had been prior to liberalization.

However, the most remarkable indication of this trend (opposite to what most experts had recommended and expected at the time when electricity liberalization was launched) were the cases of vertical and horizontal reintegration taking place in the industries that had earlier been restructured in line with the structural canon. This was particularly visible in the UK, whence the structural canon had originated. In the light of this reverse direction of the structural developments in the European electricity sectors a very important question arises. It concerns the reasons for the retreat from this structural canon.

The answer to this question has recently become the subject of lively discussion and controversy. The central issue is whether a growing degree of vertical and horizontal integration in the electricity industries results from (a) failure of the public and governmental organs responsible for the implementation of structural and competition policies to resist the pressures of the sector's vested interests to rebuild or strengthen the vertical and horizontal ties, and/or (b) the political will to establish national champions based on hopes that such entities will be better prepared to ensure the security of electricity

supply and to compete in the European electricity market, or (c) other factors which did not receive sufficient attention when the concept of market reforms was in the developmental stage.

This paper focuses on option (c). Although it would be inappropriate to fully ignore the first and second options, there is an increasing number of arguments for a more nuanced approach to the issue of the electricity industry's structure, especially to the model for the stand-alone electricity company. This approach is based on the assumption that the consolidation trend should not be interpreted as a process determined only by the vested interests of incumbents (and *ipso facto* not acceptable in terms of economic efficiency and interests of electricity consumers), but also as a form of rational adjustment of the electricity company model to the conditions imposed on and challenges created by competitive electricity markets. Moreover, in the longer term this adjustment can also benefit electricity customers, as well as be conducive to the strengthening of electricity supply security.

It is worth stressing that the issue of the electricity company model can be considered not only in a theoretical, but also in a practical context. The former puts the discussion on the correctness of the structural canon in a broader perspective involving barriers that may implicate the existence of limits for development of the competitive electricity markets. The latter refers to the targets of regulatory and competition policies. In the previous decade many countries targeted their policies at supporting market-oriented reforms in the electricity sectors. The visible form of these policies was active, though often not effective resistance to the consolidation pressure as it happened in both the UK and Poland. The most important conclusion of this paper is that the failure of the efforts to stop the consolidation process needs to be discussed and assessed from a wider perspective, one that should not confine the choice of industry structure to two extremes, i.e., full de-integration and full integration.

The paper starts with a short review of the origins and justification of the initial model structure for electricity liberalization as well as some discussion on the reality of the restructuring activities in the 90s. Attention is devoted to the EU unbundling initiatives. The core part of this paper discusses the signs indicating the crisis of the initial structural canon. Finally, the paper includes some comments referring to the modified form of the model structure that is emerging. This involves the vertical integration of generation and supply and allows a more horizontal concentration of electricity competitive markets.

## 2. The origin of the fully unbundled concept

In order to understand why promoters of electricity liberalization attached great importance to the restructuring component of such reforms, it is worth examining the peculiarity of the electricity sector liberalization as along with other network-based sectors like gas, water, railways, and, until not long ago, telecommunication. Said peculiarity results from the fact that each of those sectors is a combination of strictly interrelated types of activities out of which only some are potentially competitive<sup>1</sup>. The potentially competitive activities include electricity generation and supply (wholesale trade and retail sale to final consumers). Both activities represent two ends of the electricity production-service chain. In the middle of this chain there are two network-based activities – transmission and distribution. As the network activities had, and still have, natural monopoly features, and could not be regulated by competition forces, it became obvious that they had to be subjected to some form of public regulation.

This, and the fact that the previous reforms in these sectors had not achieved the planned effect, made it clear for policy makers and reform designers that the reform package could not be confined to the deregulatory measures that had proved sufficient for a spontaneous and quick development of truly competitive markets in the earlier liberalizations of non-network-based industries. Thus, to achieve a key goal of liberalization, i.e. a decrease in the costs and prices of electricity generation and supply, more complex reform programs were designed and implemented in 1984 in respect to telecommunication, and then in 1986 in respect to the gas sector (1986). The reforms consisted of three main components: (i) privatization of the vertically and horizontally-integrated incumbents, i.e. British Telecom and British Gas respectively, with the aim to make them more responsive to market and regulatory incentives;; (ii) deregulation of access to the telecommunication and gas markets to enable development of competition; and (iii) implementation of an innovative type of economic regulation.

The last component embraced the two main categories of regulatory activities: price regulation and promotion of competition. The novelty of the British type of price regulation consisted in the replacement of a model well established in the private network industries for rate of return regulation with a form of incentive regulation, widely known as an RPI-X<sup>2</sup>. The second

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<sup>1</sup> For more on liberalization and introduction competitive and regulated markets in the network-based industries see: D. Helm, T. Jenkinson (eds.), *Competition in Regulated Industries*, Oxford University Press, Oxford 1994.

<sup>2</sup> Abundant literature has developed on the issue of incentive regulation in general as well as the RPI –X type. See in Polish: A.T. Szablewski, *Zarys teorii i praktyki reform regulacyjnych*

category of regulatory activity was innovative in itself, since the promotion of competition – also through encouraging new entries – was not a standard part of the previous regulatory regimes. Moreover, the most advanced traditional model of the United States' utility regulation was in fact designed to protect incumbents from competition and thus, not surprisingly, it had a long record of resisting new entries.

The decision to include the promotion of competition into the list of statutory duties of the British regulators was based on the assumption that competition in network industries could not occur and quickly develop without a sector regulator actively encouraging it. Two factors were determined as to why the telecommunication and gas regulators were made responsible for promotion of competition. The first was the evident failure of the British network industries' earlier reforms, dating to the beginning of the 1980s. Following the success of the liberalization of a number of the non-network-based sectors, these reforms had also been confined to only allowing newcomers access to the incumbent networks.

The second – much more important – factor referred to the fact that the privatization of both incumbents was not to be accompanied by their pro-competitive restructuring. As a result, they had been privatized as single entities having 100% of the telecommunication and gas markets respectively. This happened despite strong recommendations, especially in the British Gas case, for breaking them up. However, despite facing fierce resistance from British Gas, the British government decided to abandon its restructuring plans<sup>3</sup>. Therefore, in order to avoid repetition of previous failures in developing competition in highly concentrated markets, the Government expanded the list of the regulators' duties by adding an obligation to actively support development of competition through the use of a regulatory weapon.

Unfortunately, despite the vigorous efforts of regulators in both sectors, progress in promoting competition during the first years of their liberalization was rather slow. Moreover, the measures used by the regulators to facilitate new entries raised serious controversy over their economic rationality<sup>4</sup>. There was also one more factor that made the policy makers more determined to precede the privatization of another utility sector, i.e. electricity, with a restructuring of the biggest, vertically-integrated incumbent. This was the

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na przykładzie energetyki, Monografie Nr. 12 Instytut Nauk Ekonomicznych PAN, DiG Łódź-Warszawa 2003, rozdz. 5.

<sup>3</sup> For more details on the recommended options for restructuring British Gas see: J. Vickers and G. Yarrow, *Privatization: An Economic Analysis*, The MIT Press Cambridge, London, 1988, pp. 268–271.

<sup>4</sup> For more on this see: A.E. Kahn, *The Economics of Regulation. Principles and Institution*, The MIT Press, Cambridge, Mass. 1990, p. XXXIV.

growing awareness of the nature of threats resulting from maintaining the vertical structure of privatized incumbents untouched. As the cases of both earlier privatized incumbents demonstrated, their vertical structure made it possible for them to use a well known cross-subsidy tool, one broadly applied in the network industries prior their liberalization, to prevent newcomers from entering the potentially competitive markets<sup>5</sup>.

Cross-subsidy is a kind of improper, in economic terms, assignment of costs among different activities that may also be easily utilized by a vertically-integrated incumbent to place potential entrants at a competitive disadvantage<sup>6</sup>. In practical terms, for a vertically-integrated company it is only an internal transfer of costs from one activity to another. It enables the integrated company to use profits from its monopoly operation to cover the costs of competitive operation. However, from the perspective of its potential competitors, this type of cost-accounting system provides a vertically-integrated company with an opportunity not only to overcharge their potential competitors for use of its network, but also to unfairly lower prices on the sale of electricity in the competitive (generating or supply) markets. As a result, a vertically-integrated company can effectively, and at the cost of potential competitors, maintain its market share and block development of competition in a formally open market.

In this context, the idea of restructuring vertically-integrated incumbents to remove monopoly from the potentially competitive activities seemed to be an obvious solution to the problems faced by the telecommunication and gas regulators attempting to control the anticompetitive practices of the privatized incumbents. The concept of pro-competition restructuring was supplemented by two other elements that were supposed to improve development of vigorous competition and effective regulation. The first element involved further unbundling of activities leading to the separation of transmission from distribution activities and separation of the network activities from trade activity (wholesale and retail).

The second element of the restructuring referred to horizontal de-integration within generation, trade, and distribution activities, leaving the transmission activity as a national monopoly. De-integration of generation and trade was aimed at enhancing competition through the creation of a competitive structure for both types of electricity markets. In turn, de-integration of distribution

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<sup>5</sup> The concept of cross-subsidy attracted the attention of many economists a long time before the liberalization processes started. See more on this with extensive list of publications: E Ralph, *Cross-subsidy: A Novice's Guide to the Arcane*, Duke University, Durham NC 27706 USA, 1992, paper available on the web.

<sup>6</sup> In Polish that issue is discussed by: A.T. Szablewski, 'Konsolidacja a konkurencja na polskim rynku energii elektrycznej', (2002) 2-3 *Gospodarka Narodowa*.

was justified on regulatory grounds. Two arguments were provided here. The first one indicated the advantages of transparency in cost calculations that could facilitate non-discriminatory access to the network. This argument also referred to the unbundling of transmission. The second argument stressed that the existence of several distribution companies, each having monopoly power in its own region, was conducive to implementation of incentive regulation in the form of so-called ‘yardstick competition’<sup>7</sup>.

This approach to the optimal structure for the electricity industry, based on the fully vertically and horizontally de-integrated sector, led to the model for a stand-alone electricity company. Unlike the traditional model, the new model assumed that an electricity company could perform only one of four key types of activities. Justification of the new model included an assumption that technological change, including the development of computer and internet technology, had significantly diminished economies of vertical integration and made electricity generation and trade potentially competitive activities. Due to the low transactions costs, the stand-alone generating and trading companies had become a better – in terms of economic efficiency – alternative to the traditional model for an integrated company<sup>8</sup>.

### 3. Restructuring developments

Though the rationality of the structural canon for electricity liberalization was not seriously questioned in the first stage of the reform programs’ implementation, few countries decided to embark on a radical restructuring of their vertically- and horizontally-integrated incumbents<sup>9</sup>. Wherever the governments began discussing the restructuring option as part of the liberalization reform package, the incumbents put up strong resistance that significantly slowed, or even inhibited its implementation. The course of the de-integration process depended on the following factors: (i) the extent of the initial degree of vertical sector integration in a given country; (ii) the ownership status of electricity companies; and (iii) the type of de-integration strategy chosen.

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<sup>7</sup> Yardstick competition involves use by a regulator of information from several firms to determine the incentives for each firm. J. Sobel, ‘A Reexamination of yardstick competition’ (1998) 8(1) *Journal of Economics and Management Strategy*.

<sup>8</sup> For more on this see: R.J. Mitchels, ‘Vertical Integration: The economics that Electricity Forgot’ (2004) 17(10) *The Electricity Journal*, pp. 12–13.

<sup>9</sup> See for example the restructuring plan for Enel in Italy: M. Giulletti, R. Sicca ‘The liberalization of the internal market for electricity: what choices for Italy’ (1999) 8 *Utilities Policy*.



As far as the first factor is concerned two traditional models of vertical integration – the fully- and partially-integrated model – need mention. The fully-integrated model involved a national monopoly company performing all vertically-related types of activities (from electricity generation to its supply). Breaking up such a company could theoretically lead to an ideal – in vertical and horizontal terms – structure for the electricity sector. According to the views promoted at the initial stage of the sector's liberalization, the splitting of a national incumbent was to result in the division of the electricity sector's structure into three separate sub-sectors – namely, generation, transmission, and distribution. The first sub-sector was to consist of a number of competing companies. The second was to operate as a single, nation-wide company, while the third sub-sector was also to consist of a number of companies, but these companies would perform two activities – distribution and the supply of electricity to final consumers. The unbundling of the distribution companies was scheduled to take place later and it was to complete the process of shaping the electricity sector's structure as a one based solely on stand-alone companies.

Poland was one of the very few countries whose electricity sector was structured closely in line with this model. At the beginning of the 90s, the domestic electricity sector that had operated as a nation-wide monopoly structure called *Zjednoczenie*, was disintegrated into three sub-sectors. These sub-sectors included more than 20 big generating companies, one national transmission company, and 33 distribution companies. The disintegration, however, was not a result of a planned restructuring operation aimed at creating conditions for developing competitive electricity markets. It was rather an effect of the market transformation of the whole Polish economy. The transformation led to the collapse of many of the old corporate structures, including *Zjednoczenie*. This, in turn, inspired some experts to consider and undertake work on the concept of market-oriented reforms that would take advantage of such a favourable sector structure. The program of reforms that followed was based on the assumption that supply sub-sector (which at the time was non-existent) would naturally evolve as a result of a regulatory framework that has to be developed in order to enable real competition in the sale of electricity for final consumers<sup>10</sup>.

The partially-integrated model embraced two types of companies. The first type consisted of companies that combined generation and transmission

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<sup>10</sup> For more extensive discussion of the Polish program of reforms in the electricity sector in: A.T. Szablewski, 'Koncepcja i programy wdrażania reform w energetyce polskiej' [in:] P. Jasiński, A.T. Szablewski, G. Yarrow, *Konkurencja i regulacja w przemyśle energetycznym. Brytyjskie doświadczenia a polskie problemy*, Polska Akademia Nauk, Instytut Nauk Ekonomicznych, ELIPSA, Warszawa, 1995.

activities. The second referred to distribution companies that, as mentioned above, performed both network and trade activities. Depending on the country, the number of such vertically-integrated companies varied. However, distribution-supply companies were significantly more numerous than the generation-transmission companies.

The restructuring of the first type of vertically-integrated electricity company involved separation of generation from transmission accompanied by a further horizontal de-monopolization of the generation sub-sector. The restructuring of the British generation and transmission company CEBG that preceded its privatization may serve as an example of that type of unbundling. It resulted in the creation of three generating companies and one national transmission monopoly company. On the distribution side of the British electricity sector, there was no need for companies' horizontal restructuring as this sub-sector had already been divided into twelve companies. During their privatization, they maintained their vertical structure, i.e., distribution and retail activities. However, instead of their ownership separation, these companies were obliged to implement what was known as an accounting unbundling. It consisted of performing a separate calculation of distribution and supply costs.

It is worth noting that in all cases of the successful electricity liberalization, the reform package included measures that ensured effective unbundling of the managing transmission activities. This conclusion is based on numerous empirical studies that analyzed various implications of transmission unbundling<sup>11</sup>. Although the research results are mixed in respect to some unbundling implications, it is beyond a doubt that the effective unbundling of transmission was a crucial factor that facilitated liberalization. In all the countries that have succeeded in creating a competitive electricity market, the reform package included implementation of arrangements that ensured independent management of transmission activity. In turn, countries that failed to proceed fast with development of competitive electricity markets (like Germany and France), have not had the effective unbundling regime in place.

In the 1990s, wherever the process of forced vertical de-integration took place, it stopped with unbundling generation, transmission and distribution, leaving unbundling of the electricity trade from distribution for the future. New Zealand is the only case known to date of forced ownership unbundling at the distribution level<sup>12</sup>. The unbundling was carried out in 1998 as the

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<sup>11</sup> A review of results of many research projects can be found in the paper by M. Pollitt, 'The arguments for and against ownership unbundling of energy transmission networks' (2008) 36 *Energy Policy*.

<sup>12</sup> See: P. Nillesen, M. Pollitt, 'Ownership unbundling in electricity distribution: empirical evidence from New Zealand' *EPRG Working Paper in Economics* 0836, 2008, paper available on the web. The Authors point out that forced ownership unbundling at the distribution level has

third phase of the reform process that started in 1987. The earlier phases had provided a set of conditions there were to establish a legal framework for the operation of competitive and regulated electricity markets. However, the disappointing results of the implemented legal measures – especially in terms of development of competition – led the government to decide to prohibit companies from being involved in a network (transmission or distribution) and to prohibit potentially competitive businesses (generation and supply) from performing both types of activities. In the case of distribution, the majority of companies retained their distribution business and sold their supply business<sup>13</sup>.

Not by chance, forced ownership unbundling occurred in the electricity industries with the state-owned companies. This is because such an operation seems, at least theoretically, much easier to carry out. The splitting up of a state-owned company prevents accusations of interference with private property rights which may result in inhibiting the planned restructuring, or significant increase of the costs of legislation or procedures needed to implement planned pro-competitive reorganizations of the private entity. Therefore, in the case of the network industries with state-owned incumbent companies, a key recommendation for governments preparing reforms aimed at their liberalization was to implement the pro-competitive structural changes prior to privatization (only if the latter was part of the reform program).

However, in practice, the restructuring of a state-owned company was not so easy to perform. As the British and Italian cases demonstrated, governments usually faced very strong resistance from the incumbent companies and their employees based on what seem to be rather obvious reasons. Generally, it was a defence of their vested interests since the unreformed structure let them use market power to block new entries to formally open markets<sup>14</sup>. Usually, these vested interests were masked by the more rational argument stressing that the unbundling operation had to involve significant transaction costs. These costs arise when the internal links within an integrated company are replaced by market transactions between unbundled companies. Though the argument set a solid base for attacking the unbundling concept, its supporters claimed that the decrease of costs due to a rapid development of competition in electricity generation and supply spurred by an unbundling operation far outweighed

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also been imposed by law in the Netherlands in 2007. The unbundling is to be obligatory since January 2011. More on the Netherlands case in: R. Kunneke, T. Fens, 'Ownership unbundling in electricity distribution: The case of the Netherlands' (2007) 35(3) *Energy Policy*.

<sup>13</sup> According to Nillesen and Pollitt, of the then 36 integrated distribution companies only three decided to continue operating as electricity supply companies, divesting their network (distribution) activity. *Ibidem* p. 18.

<sup>14</sup> For more discussion of this argument see: K. Bobińska, 'The Defense of Monopoly as a Determinant of the Process of Transformation of State-owned Infrastructure Sectors in Poland' (2008) 1(1) *Yearbook of Antitrust and Regulatory Studies*.

its disadvantages in the form of transaction costs. Therefore, they strongly advised the governments to precede privatization with the implementation of pro-competitive restructuring<sup>15</sup>. However, this advice was rarely taken by the governments and shaped their structural policy.

To complete the list of the methods through which unbundling has been implemented, voluntary ownership separation needs to be mentioned. It refers to the unbundling of distribution and commercial activities, since unbundling at this level is a much less common practice than in the case of transmission<sup>16</sup>. At a significant scale, voluntary separation took place in the UK as well as in certain other countries like the US, where one of the most developed and successful competitive electricity markets in the world operates in Texas. When – after a few years of the Texas wholesale competitive market operation – retail competition was introduced in 2002, two of the three largest incumbent utilities decided to voluntarily divest their competitive operations, i.e., generation and retail service, and concentrate exclusively on regulated transmission as well as distribution as a single company<sup>17</sup>.

#### 4. EU unbundling initiatives

The unbundling concept was strongly promoted by the European Commission during a 7 year-long process of negotiation the first Electricity Liberalization Directive<sup>18</sup> (the Directive). It was to provide a suitable legal framework that would force effective and coordinated implementation of the liberalization programs in the Member States. However, because of the strong opposition of some Member States that were generally reluctant toward electricity liberalization, most provisions of the Directive were a result of an unsatisfactory compromise that made its adoption in 1996 a symbolic rather than significant event<sup>19</sup>. A good example of such a compromise was

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<sup>15</sup> The importance of strong governmental determination for the success of electricity sector liberalization was underlined many times. M.B. Rosenzweig, C. Pabon-Agueldo, 'Power Sector Reform: Is there a Road Forward?' (2006) 19(6) *The Electricity Journal*.

<sup>16</sup> A review of transmission unbundling status in the European countries is provided by: R. Haas, J-M, Glachant, N. Keseric, Y. Perez, 'Competition in the Continental European Electricity Market; Despair or Work in Progress' [in:] F.P. Sioshansi, W. Pfaffenberger (eds), *Electricity Market Reform. An International Perspective*, Elsevier, 2006, p. 276.

<sup>17</sup> See P. Adib, J. Zarnikau, 'Texas: The Most Robust Competitive market in North America' [in:] F.P. Sioshansi W. Pfaffenberger (eds), *Electricity Market Reform...*, p. 392.

<sup>18</sup> Directive 96/92/EC of the European Parliament and of Council of 19 December 1996 concerning common rules for the internal market in electricity, OJ [2007] L 27/20.

<sup>19</sup> L. Hancher, 'Slow and not so sure: Europe's long march to electricity liberalization', (1997) 10(9) *The Electricity Journal*.

an unbundling requirement that took the weakest form of management and accounting. In practical terms, the Directive required vertically-integrated electricity companies to carry out their activities (generation, transmission, and distribution) by separately managed units that were also obliged to produce separate sets of accounting.

Therefore, it is not surprising that the Directive was not a driving force behind electricity liberalization in some European countries. According to the Commission and the energy traders<sup>20</sup>, one of the most important reasons for the very unsatisfactory progress in opening most of the domestic electricity markets was the existence of persistent anticompetitive practices among vertically-integrated companies. By setting discriminatory terms of use for transmission and distribution lines, such companies blocked the access of their potential competitors to electricity markets. Further strengthening of the unbundling regime for vertically-integrated companies had therefore become a priority goal of the Commission determined in speeding up real progress in electricity liberalization in the EU.

During the drafting stage of the next Liberalization Directive<sup>21</sup>, the Commission succeeded in getting approval for a more advanced form of the unbundling requirement imposed on the vertically-integrated companies. This involved the obligation to establish system operators – the Transmission System Operator (TSO) and Distribution System Operator (DSO) respectively – as subsidiaries of such vertically-integrated companies (i.e., their parent companies) that were to operate on the basis of the ‘legal unbundling regime’. This regime included a list of detailed requirements that were to ensure that those persons responsible for network management would have a necessary degree of independence from the owners of the network<sup>22</sup>. For example, one of these requirements referred to salary rules of the TSO/DSO staff that had to depend exclusively on the performance of the network business and be established on the basis of pre-fixed elements. The other one provided that the staff were not allowed to undertake tasks referring to other non-network-related activities within the parent company.

It is worth emphasizing that in the comments made in the document discussing the details of the unbundling regime, a vertically-integrated company

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<sup>20</sup> See: *Unbundling as a crucial factor in the completion of European Electricity and Gas Market liberalization*, Position Paper, EFET, September 2000.

<sup>21</sup> Directive 2003/54/EC of the European Parliament and of Council of 26 June 2003 concerning common rules for the internal market in electricity and repealing Directive 96/92/EC, OJ [2003] L 176/37.

<sup>22</sup> A detailed description of this regime was provided in: An detailed description of this regime was provided in: *The Unbundling Regime, Note Of DG Energy &Transport On Directives 2003/54 and 2003/55/EC On The Internal Market In Electricity and Natural Gas*.

was defined as a company that performs “at least one of the functions of transmission or distribution and at least one of the functions of generation or supply of electricity”<sup>23</sup>. Therefore, the unbundling regime did not apply to generation and supply activities. In other words, from the EU legislation perspective, both activities were allowed to be performed within one company.

Despite more demanding unbundling requirements contained in the second Liberalization Directive, the reports of the Commission inquiry into the functioning of the EU electricity markets that were regularly published indicated that vertically-integrated companies were still able to continue blocking access to their transmission and distribution grids and prevent or hinder new entry to the electricity markets. Therefore, in the opinion of the EU Commission, introduction of further measures addressing the problem of effective unbundling was necessary in order to deliver non-discriminatory access to electricity networks and thereby speed up the process of internal electricity market completion. Preparing its Third Energy Package<sup>24</sup>, the Commission’s preferred option was ownership unbundling.

However, because the Commission anticipated problems with getting approval for this proposal from certain countries rather reluctant to implement more aggressive pro-liberalization measures, its proposal was restricted to imposing stricter unbundling requirement only with respect to transmission activity, leaving unbundling at the distribution level for further discussion and decisions<sup>25</sup>. In addition, in the Third Package put forward on September 19, 2007, the Commission added a second, compromised option. It assumed retaining by generating companies of their network assets, but it deprived them of the ongoing, operating management of these assets. The crucial point of this option was transfer of responsibility for network management that involved daily management and also the right to make commercial and investment decisions to a special company, the Independent System Operator

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<sup>23</sup> *Ibidem*, p. 5.

<sup>24</sup> The Package includes 2 Directives and 3 Regulations: Directive 2009/72 EC of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC; Directive 2009/73/EC 13 July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC; Regulation (EC) No 713/2009 of 13 July 2009 establishing an Agency for the Cooperation of Energy Regulators; Regulation (EC) No 714/2009 of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity and repealing Regulation (EC) No 1228/2003; Regulation (EC) No 715/2009 of 13 July 2009 on conditions for access to the natural gas transmission networks and repealing Regulation (EC) No 1775/2005.

<sup>25</sup> As it was explained by the Commission, because ‘...of the recent entry into force of the last liberalization date in a number of states, it would seem to be disproportionate to go a step further in forcing unbundling in this activity’ (distribution). Impact Assessment, Accompanying Report, European Commission, Brussels, 2007, p. 4.

(ISO). This company was to be designated by national governments with the Commission's prior approval and be provided with appropriate arrangements ensuring a sufficient level for its independence.

This compromise option turned out to be unacceptable, especially for France and Germany. Both countries had very powerful vertically-integrated companies that strongly opposed the concept of transferring all decisions concerning management of transmission activity to an ISO. Under pressure of these countries, a third option for Independent Transmission Operator (ITO) was introduced to the final version of the Third Package. This option was similar to the ISO option in allowing integrated companies to retain ownership of network assets, but in contrast to the ISO, a newly established company (ITO) would be responsible only for daily network management. Although the integrated companies were left to make commercial and investment decisions, the ITO option included a list of 5 institutional arrangements that were to ensure independent management of the grids, and especially to prevent the ITO from discriminating against suppliers applying for access to the grid.

The Third Package, including these three unbundling options, was adopted finally by the Council on June 25, 2009. To strengthen its impact on the pace of the European electricity market liberalization, some other important provisions, especially concerning the regulatory framework, have been included. They provide more power for national sector regulators and create a new European agency with the task of overseeing and improving cross-border regulation for electricity and gas transmission between the Member States. In addition, the earlier voluntary cooperation of national TSOs is to be formalized through the establishment of a new body – the European Network for Transmission System Operators. Its purpose is to harmonize standards for grid access as well as coordinate and ensure proper network planning and investment to prevent blackouts.

## **5. The first signs of crisis in the restructuring model**

The beginning of the current decade brought a visible change to the overall liberalization climate. Visible in some countries, the decrease in support for the radical actions that were intended to introduce competitive electricity markets was followed by, *inter alia*, a change in attitude towards the sector's structure. The change was a result of a number of factors, in particular the Enron bankruptcy, the Californian crisis, the British Energy problems, and the return to the vertical structure – although in a modified form – that took place in the British electricity sector. The importance of these events lies in

the fact that they inspired intensive development of research on the specific features of the electricity markets which previously had been overlooked or undervalued by promoters of electricity liberalization.

The results of the research demonstrated a growing need for reevaluation of the issue of vertical integration in the electricity sector, and thus also the earlier discussed structure model for electricity liberalization. It is therefore worth taking a closer look at these cases. The Enron insolvency, the Californian crisis, and the British Energy problems are interesting in that they show real threats faced by stand-alone electricity companies operating in competitive wholesale and retail electricity markets. In turn, the British case of backward vertical integration shows how companies that are free to decide about their structure react to the upcoming full opening of the electricity market, i.e., the time when all customers, including households, can choose their supplier.

The collapse of Enron is usually considered in a broader context that goes beyond the normal (for the market economy) case of corporate bankruptcy. Because of the size of Enron<sup>26</sup> and the fact that its insolvency to a great extent was of a criminal nature, some observers saw it not only as a problem of losing trust in capital markets, but even as a reason to question free markets at all<sup>27</sup>. On the other hand, sceptics of radical electricity liberalization treated it as proof of the defeat of the whole idea of energy liberalization<sup>28</sup>. Even if this opinion was exaggerated, certain factors indicate that Enron's fall and the Californian crisis have significantly contributed to weakening support for electricity liberalization among US regulators, policy makers, experts, and public opinion.

Enron's case should be considered from the perspective of the structural aspect of the liberalization concept. In this respect, at least two factors seem important. Firstly, in the US, Enron was the most recognizable product of liberalization and an example of an energy company which, without having meaningful generation or network assets, could make a huge financial success in a very short time<sup>29</sup> by focusing its activity on competitive gas and electricity wholesale markets. Secondly, *Fortune* magazine ranked Enron as the most innovative company for six years in a row for launching a novel business in energy (electricity and gas) trading. It was therefore no surprise that its

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<sup>26</sup> Enron was the second largest corporation to have ever gone bankrupt.

<sup>27</sup> See Editorial Board, 'Enron's Sins', (2002) *Wall Street Journal*, January 12.

<sup>28</sup> This opinion was expressed for example by J. Stiglitz *The Roaring Nineties: A New History of the World's Most Prosperous Decade*, 2003, ch. 10. In-depth discussion of Enron's Case is presented by: J.L. Weaver, 'Can Energy Markets Be Trusted? The Effect of the Rise and Fall of Enron on Energy Markets' 2004 *Houston Business and Tax Law Journal*.

<sup>29</sup> In December 2001 – the year when Enron was listed as the seventh largest company in the Fortune 500 – it declared insolvency.



bankruptcy significantly weakened belief in the workability of the model of a stand-alone electricity company focused on wholesale and retail activities.

On the other hand, the British Energy case signalled the poor workability of this model with respect to electricity generation. Providing 20% of Britain's total electricity supply, British Energy was the largest electricity producer and the only one that had not been involved in the process of vertical reintegration of generation and distribution/supply activities. Unlike the other reintegrated British electricity generators, it was unable to compete in the fully liberalized domestic electricity market. In 2002, its financial condition was so grave that it was close to becoming insolvent. The company was rescued by the government which provided substantial financial aid and therefore kept British Energy operational<sup>30</sup>.

However the collapse of Enron was not as important – at least in the US – as the Californian crisis, especially in terms of its impact on the increasingly critical attitude towards radical liberalization, in particular that in line with the British patterns<sup>31</sup>. The Californian program of considerable restructuring and the launch in 1998 of competitive generation, wholesale and retail markets were to significantly improve companies' efficiency, but mostly to decrease electricity prices for final consumers. However, only two years after the new market mechanisms were set in motion, it became clear they had not achieved the above goals. The most undesired results of the Californian reforms were: an explosion of wholesale electricity prices (within 14 months average prices increased tenfold), their very high volatility, long lasting supply shortages, and unprecedented insolvencies of the two largest electricity state companies.

Without focusing closely on the factors that triggered the collapse of California's electricity reform program<sup>32</sup>, it is worth taking a closer look at the role of the structural factor. This was emphasized in most of the serious analyses of the Californian electricity reform failure as a factor that significantly contributed to such failure, but not always was it treated as an argument indicating an important weakness of the vertical unbundling concept. To advance this argument, two pivotal components of the Californian electricity liberalization reform package should be mentioned.

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<sup>30</sup> M. Zakary, *British government saves British Energy from bankruptcy*, available at: [http://www.bellona.org/english\\_import\\_area/energy/nuclear/26199](http://www.bellona.org/english_import_area/energy/nuclear/26199).

<sup>31</sup> A lot of publications indicate the negative impact of that crisis on the course of liberalization of the US electricity sector: S.A. Blumsack, J. Apt, L.B. Lave, 'Lessons from the Failure of U.S. Electricity Restructuring' (2006) 19(2) *The Electricity Journal* or T.M. Lenard, 'Electricity "Restructuring": What Went Wrong' (2005) 18(6) *The Electricity Journal*.

<sup>32</sup> There are many references to the reasons and consequences of California's electricity crisis on the course of liberalization of the US electricity sector: S.A. Blumsack, J. Apt, L. B. Lave, 'Lessons from the Failure...'; T.M. Lenard, 'Electricity "Restructuring"...'.

The first component referred to the forced ownership unbundling requirement. Two of the three largest Californian electricity companies were ordered to divest – as specified by law – part of their generating capacity. They were also strongly encouraged by regulatory measures to divest all other capacity, as well. As a result, they were left with generating capacity much below the level needed to fulfill their duty as a default supplier of electricity<sup>33</sup>. The second factor was the adoption of a new model for trading arrangements, based on the assumption that utilities supplying electricity to final consumers would be buying electricity only from the just established, competitive spot wholesale market. This model also forbade utilities from buying electricity for its resale to consumers directly from generators on the basis of long purchase contracts. Since such contracts normally serve as an efficient measure protecting utilities from the very high – by nature – volatility of short-term wholesale electricity prices, their lack made utilities susceptible to the monopolistic manipulation of the generators. This susceptibility was significantly strengthened by another component of the trading arrangements' model, i.e., a price cap imposed on retail prices that made it impossible for the utilities to pass on the fast rising costs of their wholesale electricity purchases to final consumers.

Examining the causes of the Californian crisis, P. Joskow, one of the most distinguished researchers and experts on energy markets, noted the unusual attributes of electricity that make design of a well-functioning competitive electricity market a very difficult task<sup>34</sup>. His crucial point was that spot competitive electricity markets work well where supplies are abundant due to adequate capacity and reliable generation and network infrastructure<sup>35</sup>. However, when supplies become tight and demand is not elastic, prices can explode, which is exactly what happened in California. Concluding his analysis, Joskow focused on the structure of the trading arrangements introduced in

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<sup>33</sup> This is a supplier obliged to sell electricity at regulated prices to customers who do not want to change supplier.

<sup>34</sup> P.L. Joskow, 'California's Electricity Crisis' 17(3) *Oxford Review of Economic Policy*. There is a growing literature on the peculiarities of electricity competitive markets and their implications for the structural model of an electricity company D. Newbery, *Regulatory Challenges to European Electricity Liberalization*, DAE Working Paper WP 0230, 2002, p. 13 or D.W Bunn, 'Institutional Intent and Strategic Evolution Electricity Markets' [in:] *Complex Electricity Markets* (Editor: W. Mielczarski), Series: The European Power Supply Industry, Wyd. Instytut Elektroenergetyki Politechniki Łódzkiej I Stowarzyszenie Elektryków Polskich, Oddział Łódzki, Łódź 2006.

<sup>35</sup> This point has also been made in many other publications. See for example: D. Newbery, 'Problems of liberalizing the electricity industry', (2002) *European Economic Review* 46. In Polish, a broad review of views on implications of electricity competitive markets provides: A.T. Szablewski, *Liberalizacja sektora elektroenergetycznego a bezpieczeństwo dostaw. Wnioski dla polityki energetycznej i regulacyjnej*, forthcoming.

the Californian market as one of the main reasons for the troubles in their functioning.

According to Joskow, solving problems generated by volatile and very excessive spot prices for electricity needs to use long-term, fixed-price contracts negotiated well in advance of spot market crises. Therefore, a key weakness of this structure was prohibition imposed on vertically-restructured distribution companies to enter into long-term fixed-price electricity purchase contracts that could stabilize electricity prices. However, a further question arises – namely, if such long contracts are a viable option in markets where retail competition is allowed.

This question became an important subject of discussion in the UK just when plans for the Californian package of reforms involving the strict unbundling of distribution and supply business were being prepared. Due to the approaching date on the full opening of the British retail electricity market (1998), it was becoming obvious that distribution companies would be much less willing to enter into long-term contracts with generators. The reason for this was the lack of certainty as to whether customers would be willing to purchase such contracted electricity if they had a choice to select their own supplier. This, in turn, could create serious problems for generators, as without such contracts they would face difficulties in attracting new capital needed to finance new generation facility<sup>36</sup>.

One obvious answer to the above question was vertical integration initiated by the generators and, later, also distribution/supply companies. Initially, the generators' pressure to begin vertical consolidation was strongly resisted by the government, the regulator, and Monopoly and Mergers Commission (MMS) because of its potentially anticompetitive effects. However, with time resistance weakened and a new approach to vertical integration prevailed in the governmental and MMC circles. This approach was based on the argument that competition in generation had developed and the stable competitive structure of generation and supply markets gave little scope to use vertical linkages to exploit customers.

In a very short time, vertical integration again became a standard model for the largest British electricity companies, although with some important differences in comparison with the earlier recommended model structure based on full ownership unbundling. The process of integration took two forms, the first being more traditional with integration of generation, distribution, and supply (retail) businesses and the second being more innovative with integration of merely generation and supply businesses. Many factors justify the view that the latter model of vertical integration may become the leading

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<sup>36</sup> For more on this see: D. Helm, *Energy, the State, and the Market. British Energy Policy since 1979*, Revised Edition, Oxford University Press 2003, chapter 12.

model in the future. This includes the increasing pressure of the European Commission on further deepening of separation of supply from distribution activities and the fact that other countries with mature liberalization in the electricity sector also follow that trend.<sup>37</sup>

## 6. Concluding remarks

The increasing intensity of the consolidation processes in the first years of the new century seems to indicate that the above outlined cases were the first symptoms of the non-workability of the ideal structural model that was recommended as a part of the electricity liberalization reform package. This model was formed in the early days of network industries' liberalization and it predicted that electricity sectors would be evolving into a structure with a large number of separate generating and wholesale/retail supply companies responsive only to market forces. However, the currently emerging vertical model for electricity companies is quite different from this initial model. Moreover, many in-depth economic studies on the structural dimension of electricity liberalization re-examine arguments for and against vertical integration, and their conclusions tend to underline the advantages of a balanced mixture of vertical integration and liberalized markets<sup>38</sup>.

In other words, the structural canon (or, as some authors call it, the industrial reference model or industrial paradigm)<sup>39</sup> for electricity have changed. It has shifted from a preference for vertical disintegration between generation and trading activities towards a preference for vertical reintegration of these activities within one company. This shift represents a more serious change to energy policy priorities. Liberalization was a response to the growing need to make electricity companies more efficient in terms of costs. Through lower prices liberalization was to pass the advantages of increased cost efficiency to the final electricity consumers. To achieve this task, conditions for the effective operation of competitive markets had to be created. This required an appropriate legal and regulatory framework, pro-competitive restructuring

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<sup>37</sup> A good example is again New Zealand. Shortly after the full vertical unbundling of electricity companies and imposition on network owners a legal prohibition to enter competitive activities, there was a rapid realignment of the sector with energy retail businesses being quickly acquired by generators.

<sup>38</sup> Intensive research in this subject is presented in: H-P. Chao, S. Oren, R. Wilson, 'Revaluation of Vertical Integration and Unbundling in Restructured Electricity Markets' [in:] F.P. Sioshansi, (ed), *Competitive Electricity Markets: Design, Implementation, Performance*, Elsevier, 2008.

<sup>39</sup> R. Haas, J.-M. Glachant, N. Keseric, Y. Perez, *Competition in the Continental...*, p. 286.

of the incumbents, as well as active regulation to promote competition in order to increase the number of generating and supplying companies.

The development of competitive and regulated electricity markets has resulted in a crucial reallocation of bearing economic risk. In the traditional model of regulated, vertically-integrated electricity companies, the whole risk was passed to the final consumers. Due to such risk allocation, the regulated utilities were assured of full recovery of prudently incurred investments and expenses, including the cost of capital. These regulatory arrangements, in turn, would facilitate them access to cheap capital necessary to finance costly generation and network investments. The introduction of competitive electricity markets (regulated through quasi-market incentives) reversed the direction of bearing risk. Shifting risk to the electricity companies led to a significant increase of the cost of capital and made it much more difficult for them to arrange financing of their investments.

This was not a problem in the first years of liberalization since the electricity sectors inherited a significant excess of generation and network capacity. However, when, as a result of investment shortage, this began to diminish, a traditional priority of energy policy (i.e. ensuring security of electricity supply) was back in the game. The cost of capital and easy access to capital again became key energy policy and regulatory issues. The solution to those issues involves a compromise between generating market-based incentives to reduce companies' operating costs and incentives to increase investments in electricity generation, transmission, and distribution. The central part of this compromise seems to be a structural change of the model for electricity liberalization. The emerging model involves the vertical integration of generation and supply and allows more horizontal concentration of competitive electricity markets.

From this perspective, monitoring the structural changes of the competitive electricity markets becomes of critical importance. This leads to another controversial issue – namely, the division of responsibility for competition policy in the electricity sector between specialized sector regulatory agencies and competition authorities. In other words, this is a question as to whether finding an appropriate level of vertical and horizontal integration in the electricity markets requires a much deeper knowledge of electricity markets and therefore should not be subjected to the general competition law enforced by the competition authorities<sup>40</sup>.

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<sup>40</sup> Contrary views on this subject are presented in: D. Newbery, *The Relationship Between Regulation and Competition Policy for Network Industries*, CWPE 0631 and EPRG 0611, March 2006 and M. Pollitt, *The Future of Electricity (and gas) Regulation*, CWPE 0811 and EPRG 0819, May, 2008.

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