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Equal access to the energy infrastructure as a precondition to promote competition in the energy market. The case of European Union

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ABSTRACT

In many EU countries, the infrastructures for supplying electricity and gas (electricity networks, gas pipelines, and storage facilities) are still properties of the so-called vertically integrated undertakings (VIU) responsible for the extraction or generation, supply, and transmission and distribution of the energy. While competition can be promoted in the generation/production and supply side of the vertical integration, transmission and distribution segments remain natural monopolies that hinder market mechanisms. Vertical integration simply raises the possibility for incumbents to favor their own divisions and to block new entrants. As a result, non-discriminatory and equal access to the electricity and gas transmission and distribution networks, also LNG and storage facilities, is crucial to foster competition in politically delicate structures of the electricity and gas markets.

1. General remarks

Reliable and continuous supply of both electricity and gas at reasonable prices is an essential public service. In fact at present, the level of economic and social development, which has been achieved in the EU causes energy, especially electricity to be a public good, pertained to everyone, without differentiation on material status. Paradoxically, energy is also considered to be a commodity in the case law of the European Court of Justice,[2] and as such, its price should be determined by supply and demand (Jamasb and Pollitt, 2005; Joskow, 2006a; Nowak, 2009a), not by non-market factors such as administrative price regulation. The result is a fundamental questions: should electricity, like all material goods, especially finite goods, be left to market forces, or should it be available to everyone, even those who cannot afford to pay a fair market price for it (thus the electricity price should be regulated)? Regulated prices can be helpful in protecting customers in specific situations—for instance, in the transition period towards effective competition,[3] or when customers are vulnerable.[4] However price regulation, which in fact might be declared as public service obligation, should be well balanced and should only be transitional—that is, it should be eliminated at a certain date or when certain preconditions of the market are met. Otherwise it may have a very negative impact on the market. Price regulation may be used to avoid market opening, to discriminate among suppliers, or distort competition.

If electricity prices remain constant in real terms when the cost of primary energy sources (such as coal, oil, or gas) rises, the principle of the free market is undermined. Similarly, low prices in the gas sector are hard to reconcile with market factors—for example, the need to move to more expensive supply sources, such as LNG. In addition, those who invest in renewable energy, which is more expensive than conventional sources of energy, are at a major disadvantage. Moreover, if regulated prices are not in line with market prices, suppliers without significant low cost generation capacities and infrastructural assets or equivalent long-term contracts will not be able to make competitive offers, which they need in order to cover their supply costs (Nowak, 2009a). As a result, regulated prices are strong disincentive for investments in new generation capacity in particular and in energy infrastructure in general (Joskow, 2006a). Lack of energy infrastructure on the other side increases market segmentation and congestion and blocks equal access to the transmission and distribution grids for all players. In addition, the transmission and distribution infrastructure—mainly networks—are very costly to construct. Because return on capital invested in networks is calculated on a long-terms basis, the energy market is unattractive to potential private small or medium investors, who usually expect quick returns. The result is that the construction and operation of the networks is left to the natural monopolies, which have an incentive to use their dominant positions to deny access to the infrastructure of potential competitors and to slow down

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[2] Case C-7/68, Commission v. Italy [1968] ECR I-633, 642.

[3] In transition periods towards well functioning competition the coexistence of regulated and market prices may be necessary to protect customers from potential abuse of dominant positions. Unfortunately in practice the coexistence of regulated and a market price is clearly not a transitory measure e.g., France and Poland. Such scheme has been valid for many years and there are no clear indications that Member States with regulated prices intend to remove them and proceed towards market prices. For more on price regulation see Nowak, 2009a.

[4] However protecting vulnerable customers should not be confused with maintaining regulated energy prices for all or certain categories of customers.

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the opening of the market for new players, in particular on the supply side. For this reason non-discriminatory and equal access to the electricity and gas transmission and distribution networks is crucial for competition to evolve. In fact in the case of the transmission and distribution of gas and electricity, all Member States in the past granted undertakings *de jure* or *de facto* exclusive or special rights to transmit, to sell, to import, to export, or to construct infrastructure. Such grants prevented competition among utilities. In consequence, access to networks by third parties in most Member States was not given any special legal protection (Roggenkamp and Boisseleau, 2005). Presently in many EU countries, the electricity networks and gas pipelines are still properties of so-called vertically integrated corporations, which are responsible for extraction, generation, transmission, distribution, and supply. Vertical integration raises the possibility that incumbents will favor their own corporate divisions, since there is both clear incentive to do so and the means to discriminate against competitors by blocking their access to the transmission and distribution infrastructures (Vaitilingam, 1999).

Vertically integrated companies discriminate against potential competitors in many ways (Jones, 2004) but the main include:

- Creating technical barriers—for example, expensive procedures for customers who wish to change suppliers (such as their obligation to install new metering devices, to set up complicated balancing timetables, or obligation to collect complex administrative documents).
- Manipulating access tariffs (for example, the transmission/distribution operator may require customers wishing to switch suppliers to inform the operator about the details of the new contract, information which than can be passed on informally to its own sales department enabling it to selectively offer discounts).
- Manipulating the availability of capacity to ensure that lines required by competitors are congested.
- Using various accounting techniques for cross-subsidies from its transmission/distribution activities to other competitive operations (generation or supply).

In order to mitigate the incentives for discriminating against competitors, and to increase equality in access to the market, it is necessary both to separate the transmission and distribution activities of a network business from its activities of production and supply (unbundling) and to ensure non-discriminatory access of third parties to the infrastructure such as networks, storage capacities or LNG terminals. This article discusses the main issues of equal and non-discriminatory access to the infrastructure, as one of the main elements of fostering competition on the energy market.

2. Third party access (TPA)–requirements of the EU law

Effective competition requires that the owners of networks must allow any electricity or gas supplier equal and non-discriminatory access to these networks. Lack of equal and transparent third party access would create an enormous entry barrier for new players and would severely hamper the development of a competitive market.

Some scholars (Jones, 2004) have argued, though, that *(…) it is unnecessary to require third party access to gas networks to permit competition in the gas sector, as potential competitors to the existing pipeline owner could construct a competing network (…)*. However, if companies are natural monopolies not because of changes in the market structure but because the State built and then transferred ownership of the infrastructure to the monopoly, then by definition the State has discriminated against every company that is not State-owned. Certainly, these companies would benefit if they did not need third party access but could afford to construct their own networks or pipelines, a possibility that would increase competition as well as security of energy supplies. The construction of the Nord Stream (formerly the North European Gas Pipeline) by the consortium, Nord Stream AG, of several major European and Russian gas companies illustrates the complexities of this alternative to third party access. The cost of the project, around Euro 10 Billion, was far too high for a single company to undertake it. Even though such projects are lucrative for the construction firms involved and benefit the nations by securing the supply of energy, their costliness militates against them. New networks, then, are not the only solution to creating an open and competitive market. For this reason the electricity and gas directives[5] provided for non-discriminatory access to the infrastructure throughout the instrument called–third party access (TPA).

In principle, there are two access regimes—regulated and negotiated. With respect to electricity, both transmission and distribution are subject to regulated third party access. With respect to the storage of gas and ancillary services related to gas (article 19 of the gas directive), Member States may chose between regulated and negotiated third party access.

To secure transparent and non-discriminatory third party access, vertically integrated companies must spin off the functions of network (system) operators—both transmission system operators (TSOs) and distribution system operators (DSOs). Article 2(4) of the gas directive and article 2(4) of the electricity directive define the parameters of TSOs. A TSO is:

> *(…) a natural or legal person responsible for operating, ensuring the maintenance of and, if necessary, developing the transmission system in a given area and, where applicable, its interconnections with other systems, and for ensuring the long-term ability of the system to meet reasonable demands for the transmission of electricity.*

This definition applies equally to a gas TSO. The transmission of electricity refers to:

> *(…) the transport of electricity on the extra high-voltage and high-voltage interconnected system with a view to its delivery to final customers or to distributors, but not including supply.*

The transmission of gas refers to:

> *(…) the transport of natural gas through a high pressure pipeline network other than an upstream pipeline network with a view to its delivery to customers, but not including supply.*

Article 2(6) of the electricity directive and article 2(6) of the das directive define distribution system operator as:

> *(…) a natural or legal person responsible for operating, ensuring the maintenance of and, if necessary, developing the distribution system in a given area and, where applicable, its interconnections with other systems and for ensuring the long-term ability of the system to meet reasonable demands for the distribution of electricity.*

[5] Directive 2003/54/EC of the European Parliament and of the Council of 26 June 2003 concerning common rules for the internal market in electricity (OJ L 176/37 of 15.07.2003). Directive 2003/55/EC of the European Parliament and of the Council of 26 June 2003 concerning common rules for the internal market in natural gas. (OJ L 176/57 of 15.07.2003).

Again, this definition applies equally to a gas DSO. The definition of electrical distribution refers to:

> *(…) the transport of electricity on high-voltage, medium voltage and low voltage distribution systems with a view to its delivery to customers, but not including supply.*

The definition of gas distribution refers to:

> *(…) the transport of natural gas through local or regional pipeline networks with a view to its delivery to customers, but not including supply.*

The key is that transmission and distribution of electricity and gas do not involve the supply or retailing of these energy goods; therefore transmission and distribution system operators cannot be involved in selling gas or electricity.

3. Regulated versus negotiated third party access

Directives require regulated third party access for all transmission and distribution networks for electricity (article 20), for gas (article 18), for gas LNG facilities (article 18), and for balancing services. Concerning gas storage Member States may chose between negotiated and regulated third party access (article 19 gas directive).

3.1. Regulated third party access

According to the directives regulated third party access requires that tariffs for access be based on well-recognized methodologies, be cost-reflective and non-discriminatory, and be published and approved by the appropriate body (for example, the regulatory authority) on an *ex ante* basis (article 20(1) of the electricity directive and article 18(1) of the gas directive)

Article 20(1) (electricity) and article 18(1) (gas), however, do not unambiguously stipulate that access tariffs should be cost-reflective. That they should be is an inference from the obligation to set objective and non-discriminatory tariffs as well as from the obligation, announced in article 23(1) of the electricity directive and article 25(1) of the gas directive, to ensure that non-discrimination is respected in practice. In addition several other articles in the directives (article 11(7) of the electricity directive or article 8(2) and 14(6) of the gas directive) mention cost-reflectivity for balancing services. Finally, the regulation on cross-border exchanges of electricity,[6] article 14(1), explicitly states that charges for access should reflect actual costs incurred:

> *Charges applied by network-operators for access to the networks shall be transparent, take into account the need for network security and reflect actual costs incurred insofar as they correspond to those of an efficient and structurally comparable network operator and applied in a non-discriminatory manner. Those charges shall not be distance related.*

If access tariffs are not cost-reflective,[7] a vertically integrated undertaking might acquire significant and unfair advantage over its none-vertically integrated rivals—for example, in the supply market. In general, the profitability of vertically integrated companies (those that conduct generation and supply business as well as network business in the form of transmission and distribution) might be achieved either by efficient business operations and available market mechanisms or by prohibited cross-subsidization among its different business divisions, where the profits and costs are accounted for in a manner that serves the company's interests. As a result, a vertically integrated company can gain an advantage in the supply market by accepting higher margins in the generation market, since the losses would be covered either by the generation sector itself or by the transmission and distribution activities.

The directives also require that, prior to coming into force, all tariffs for access to the transmission and distribution systems as well as to balancing services and LNG facilities need to be published (article 23(2–3) of the electricity directive and article 25(2–3) of the gas directive). Of course, the manner and the place (journal) where tariffs are published are left to the Member States. In order to avoid accusations of discriminatory behavior, Member States must apply their access tariffs to all customers without possibility of individual renegotiations, discounts, or exemptions. Therefore, the requirement that access tariffs apply equally to everyone is designed to ensure that any vertically integrated company that owns or controls a network company does not grant discounts to its own supply company.

3.2. Negotiated third party access

Negotiated third party access is available only with regard to gas storage,[8] line-pack, [9] and ancillary services.[10] However, article 19(1) of the gas directive gives Member States the right to choose whether to implement a negotiated or a regulated access regime. Particular attention should here be given to access to the storage.

Consumption of gas varies significantly depending on the scale of operations in industrial production as well on the day of the year and time of day. For instance consumption of gas is higher during winter than during summer, since more gas is used for heating purposes. Clearly, to meet the variably demand for gas, a certain level of flexibility in supplying it to customers is needed. Therefore, for supply companies to be able to compete on the market and respond to differences between supply and demand, they must have access to adequate storage facilities. Pursuant to article 7 of the gas directive and the unbundling requirements, gas companies (which are typically vertically integrated) that own storage facilities are obliged to establish a separate business entity with a separate accounting division responsible for

[6] Regulation (EC) No 714/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity (OJ L 211/15 of 14.08.2009).

[7] It is very important for the sake of competition in the market that the tariffs not lead to cross subsidies or discrimination between competing suppliers. In fact cost-reflective does not mean that profits should be limited only to low rates of return from the business operations. Cost-reflective tariffs, thus, include apart from costs bear to conduct the service also a reasonable profit. Very important role within cost-reflectivity is attached to the NRAs, which based on the relevant articles of the directives and regulations have to ensure that tariffs are based on

(*footnote continued*)
the cost-reflective evaluations. For more on the role of the NRAs in this regard see Note of the DG TREN on the role of regulatory authorities, 2004. pp. 4–6; additionally for cost-reflectivity see Jones (2004).

[8] Article 2(9) of the gas directive defines gas storage, gas storage facility as: *a facility used for the stocking of natural gas and owned and/or operated by a natural gas undertaking, including the part of LNG facilities used for storage but excluding the portion used for production operations, and excluding facilities reserved exclusively for transmission system operators in carrying out their functions.* For the gas storage directive requires the gas storage operator to be established which is: *a natural or legal person who carries out the function of storage and is responsible for operating a storage facility.*

[9] Line pack is defined by Article 2(15) as*: the storage of gas by compression in gas transmission and distribution systems, but excluding facilities reserved for transmission system operators carrying out their functions.*

[10] Ancillary services are defined by Article 2(14) of the gas directives stating that ancillary services are: *all services necessary for access to and the operation of transmission and/or distribution networks and/or LNG facilities and/or storage facilities including load balancing and blending, but excluding facilities reserved exclusively for transmission system operators carrying out their functions.*

storage—a storage system operator (SSO). The SSO is to provide fair and equal third party access to gas storage. This means that any user that requests access must be granted this access in the same way networks are—that is, in a non-discriminatory and transparent manner. This requirement applies to both regulated and negotiated third party access.

In this context storage and gas ancillary services—notably linepack, are important tools for ensuring security of supply, particularly during peak consumption periods. Jones (2004) claims that some Member States considered that given this, it is not appropriate to provide for regulated third party access. Clearly, storage is critical for supply and security of supply as well as for the development of a competitive market. Not so clearly, however, is the self-evidence of the argument against regulated third party access to storage. The position against regulated as opposed to negotiated third party access is based on political rather than economic or business principles. Article 19 itself does not privilege either access regime but only insists that the chosen option be transparent, objective, and non-discriminatory. The DG TREN Note on access to storage facilities (2004) provides an additional stipulation, which is that in the case of negotiated access, the SSO must publish the main commercial conditions, and that in the case of regulated access the SSO must base these conditions on published tariffs and/or other obligations. This Note, however, does not indicate that negotiated access only should be implemented. It only means that both regimes should be non-discriminatory and transparent alike. A preference for negotiated third party access might be driven by the availability of storage facilities, which are very costly to construct, and insufficient or non-existent in some countries. If this is the case, the presumption might be drawn either that the storage system operator has the discretion of choosing which company has the right of access or that a vertically integrated undertaking that possesses storage facilities can reserve for itself all the storage it wants and make available only the remaining capacity, freely negotiating terms and conditions. This latter assumption, of course, would raise doubts about whether the access was really non-discriminatory. In consequence, there is no clear reason why negotiated third party access should prevail over regulated third party access. In order to avoid potential problems with discrimination, the most appropriate body or institution to deal with the issues at hand would be the national regulator. This solution requires that Member States appoint domestic regulators who have the necessary capabilities and act independent from the electricity and gas industries and direct political influence.

That the gas storage access is necessary, but also difficult to pin down under present EU and domestic laws demonstrates the following case study.

At the end of 2006, the Gaz-System denied the trading company Emfesz Polska (of Hungarian origin) pipeline access, which it needed to fulfill contract obligations for transporting 150 million cubic meters of gas from Polish border to the largest Polish fertilizer producer, ZA Pulawy. The grounds of the denial were vague. Gaz-System claimed in favor of PGNiG SA that Emfesz did not have adequate storage capacity in Poland in order to secure trade (all storage belongs entirely to PGNiG SA). What is more, according to PGNiG SA, it needed the entire storage capacity for its operations. As a result, Emfesz lodged a complaint to the Polish antimonopoly authority, which upheld the Gaz-System decision. Emfesz then took the case to the European Commission, and now is awaiting a decision.

The Emfesz case highlights important legal issue. In Poland access to storage is regulated under article 19 of the gas directive. This article states at paragraph 2 that access procedures shall operate in accordance with objective, transparent, and non-discriminatory criteria. Since there is no need for unbundling storage capacities (only for accounting unbundling), that leaves PGNiG in charge of the storage capacity, not the TSO—that is, not the Gaz-System or other independent storage operator–which is as a matter of fact non-existent. Due to PGNiG's dominant position, Emfesz has not been able to obtain access to the infrastructure. Such development might constitute a breach of article 19. PGNiG disagrees. It claims both that it needs the entirety of Poland's limited storage capacity, which is not sufficient for sharing, and which is indispensable for its own operations. In addition, PGNiG argued that it cannot make its storage available to third parties because Act on fuel reserves[11] is forcing it to store larger quantities of gas in order to secure an adequate reserve in case of national emergencies. The Act requires every trading company that annually supplies above 50 million cubic meters of gas, imported from outside of Poland, to have a storage capacity in Poland and maintain a 30-day reserve of gas supply. Companies that import less than 50 million cubic meters per year and have less than 100,000 customers are exempt from this requirement. PGNiG currently produces around 3.9 billion cubic meters per year and imports from Russia around 7.9 billion cubic meters per year; at present, its storage capacity is only above 2 billion cubic meters. Therefore it is obvious that if argumentation of PGNiG is taken under consideration, one could ask why at the first place Polish authorities adopted Act on fuel reserves (with the aim to store gas on Polish territory) knowing that in practice it will be a dead law, since present storage capacity is already occupied and no additional capacity is available. As a result PGNiG which is already in control of around 95% of the Polish gas market, thanks to the Act on fuel reserves will be able to control also its competitors, for instance by denying them access to the storage.

Unfortunately, the fact that suppliers must negotiate with their competitors in order to contract their storage needs is a serious barrier for new entrants and undermines confidence in the market. As a result, even though it is not necessary to separate storage obligations to separate storage operators would certainly enable competitors and regulators to verify that all available storage capacity is offered to the market on transparent conditions.

4. Refusal of third party access

Article 20(2) of the electricity directive and article 21 of the gas directive deal with refusal of access. System operators may refuse access to the network system and/or storage on the grounds of insufficient capacity of the infrastructure, public service obligations, or serious economic and financial difficulties with take-or-pay contracts. System operators must justify and document any refusal, the reasons for which must be objective, transparent, and non-discriminatory; the system operator who refuses access does so equally without regard to the identity of the third party.

In order to justify a refusal of access based on lack of capacity, system operators must first demonstrate that no capacity is available. To this end system operators must base their decision on regularly published data concerning the available capacity over a certain time period, they must also include historical data on capacity. The data according to the DG TREN Note on access to storage facilities (2004) should indicate that the full working

[11] Act from 16 February 2007 on reserves of oil, oil products, natural gas and on procedures in case of emergency in security of fuel supply and disturbance on oil market. Ustawa z dnia 16 lutego 2007 r. o zapasach ropy naftowej, produktów naftowych i gazu ziemnego oraz zasadach postępowania w sytuacjach zagrożenia bezpieczeństwa paliwowego państwa i zakłóceń na rynku naftowym (Journal of Laws no.52/2007, item 343).

capacity is booked due to present use or to contractual obligations. Based on article 21(2) of the gas directive, regulatory authorities may decide against system operators if system operators refuse access to storage or gas network system on the grounds of lack of capacity when the required capacity could be provided (and can be financially justified) or when the customer is willing to pay for the enhancement. Similar reasoning applies in the case of electricity.

System operators may also refuse access pursuant to article 3 of both directives, which deal with public service obligations (PSOs). For example, gas system operators may refuse third party access to the system if such access would prevent them from carrying out their public service obligations or would endanger the security of supply or public security in general. The problem, here, is that countries dominated by vertically integrated undertakings, might rely on PSOs to limit the competition and slow down market opening.

The Community institutions understand this problem, at least implicitly, and have directed much effort toward ensuring that PSOs not be used to favor one system operator or energy producer over another or to hinder competition. And yet companies are able to engage in just such discriminatory or anti-competitive activities, in part due to discrepancies among the idea of public service obligations, Europe's competition rules, and article 106 of the EU Treaty as amended by the Lisbon Treaty[12] (former article 86 of the EC Treaty). Moreover after consulting article 106 of the EU Treaty one might get the impression that it is possible for article 106 to constitute an incentive for undertakings to accept public service obligations in order to obtain an exemption from the application of the competition rules under provisions of paragraph 2 of the same article. Article 106 (2) of the EU Treaty states:

> *Undertakings entrusted with the operation of services of general economic interest or having the character of a revenue-producing monopoly shall be subject to the rules contained in this Treaty, in particular to the rules on competition, insofar as the application of such rules does not obstruct the performance, in law or in fact, of the particular tasks assigned to them. The development of trade must not be affected to such an extent as would be contrary to the interests of the Community.*

However providers of public service obligations and services of general economic interest may be exempted from Treaty rules, but only to the extent that such exemption is absolutely necessary to enable them to fulfill their general economic interest mission (Marquis, 2001). In a nutshell the European Court of Justice in Case Commission versus the Netherlands[13] upheld the exclusive rights of the Netherlands[14] on the ground of public service exceptions of article 106 (2) with regard that the trade will not be affected to such an extent as it would be contrary to the interest of the Community. The Court phrased article 106 (2) of the EU Treaty (former article 86 (2) of the EC Treaty) as follows:

> *(…) Paragraph 2 may be relied upon to justify the grant by a Member State, to an undertaking entrusted with the operation of service of general economic interest, of exclusive rights which are contrary to, in particular (Article 31) of the Treaty, to the extent to which performance of the particular tasks assigned to it can be achieved only through the grant of such rights and provided that the development of trade is not affected to such an extent as would be contrary to the interests of the Community (…).*

Unfortunately article 102 of the EU Treaty (former article 82 of the EC Treaty) in conjunction with article 106 of the EU Treaty might create additional source of dilemma for the energy companies. It might happen that undertaking which has been granted by a government body exclusive right to transport and/or distribute electricity or gas in a given territory, based on the public service obligation (for instance relating to the security of supply, regularity of supply, quantity and prices of supplies, or environmental protection), might be regarded as being in a dominant position as compared to other undertakings, thus potentially breaching article 102 of the EU Treaty. Although prohibitions of article 102 (1) are designed to apply to all undertakings which hold or enjoy a dominant position, some of them may be exempted from it by the provisions of article 106 (2) of the EU Treaty, which exempts from the scope of the competition articles those undertakings entrusted with the provision of services of general economic interest. This is an area of some sensitivity in relation to the internal energy market since it raises the prospect of avoidance of market opening on the ground that this is necessary to protect security of supply or public security in general. Moreover such exemptions are source of constraint either actual or potential on actions to promote competition in the energy markets in the EU therefore vulnerable to scrutiny under article 101 and 102 of the EU Treaty (former article 81 and 82 of the EC Treaty). As a result on one side, Member States are allowed to establish exclusive and special rights. On the other, they must observe the rules of the Treaty, in particular the rules on free movement of goods and competition.

According to article 27 of the gas directive, system operators may refuse access based on serious economic and financial difficulties with take-or-pay contracts. However because take-or-pay contracts are potential exceptions to the general principle of TPA, the regulatory authorities of the individual Member States permitting such refusal should take into account several issues. Derogation to negotiated or regulated access is only possible if alternative solutions are not reasonably available (Creti and Villeneuve, 2004). Also when deciding on possible derogation regulatory authorities together with the European Commission will take into account some specific criteria (laid down in paragraph 3 of article 27), among which are the objectives to achieve a competitive gas market, the need to fulfill public service obligations and to ensure security of supply or the seriousness of the economic and financial difficulties encountered by natural gas undertakings and transmission undertakings. Such derogations are thus specific-that is, made on a case-by-case basis-and limited in time. Moreover, they must be exceptional, as a solution of last resort, and the least restrictive possible.

According to article 22 of the gas directive, Member States may also request exemptions from certain provisions regarding access (to networks, to LNG facilities, and to storage facilities) when they have made major investments in new gas infrastructure. Similarly, they may request exemptions from certain provisions with

[12] The Lisbon Treaty or the Reforming Treaty has amended EC Treaty (renamed it as the EU Treaty) and other substantial parts of EU law in particular in the field o II and III Pillar. Lisbon Treaty (hereinafter EU Treaty) entered into force on 1 December 2009.

[13] Case C-157/94, Commission v. The Netherlands [1997] ECR I-5699.

[14] In the Netherlands, the 1989 Electriciteitswet (Electricity Law) provided that end-consumers would be entitled to import electricity for their own needs but that for voltages exceeding 500 V only the company NV Samenwerkende Electriciieits-produktiebedrijeven (SEP) would be authorized to import electricity for public distribution. In this case the Commission sought to show that the measures taken by the Member State (national rules) exceeded what is necessary under normal conditions of inter-Community trade, and were therefore contrary to (i) the principles of the free movement of goods and (ii) the requirement that national monopolies of a commercial character, run on a direct or delegated basis, should be operated in such a way as to eliminate all discrimination between nationals of Member States. The Commission contended that a national import monopoly prevented producers in other Member States from selling electricity within the Netherlands, to customers other than the holders of the monopoly.

regard to electricity. According to article 17 of the electricity regulation:

> *New direct current interconnectors…and significant increase of capacity in existing interconnectors, may upon request, be exempted from certain provisions (…)*

Exemptions provided above are not block exemptions, which means that they are not given to every new gas or electricity investment. They are given after a case-by-case evaluation. According to the DG TREN Note on exemptions from certain provisions of the third party access regime (2004), in order to qualify for exemptions, new investments should comply with the following criteria:

a. *the investment must enhance competition in electricity/gas supply and enhance security of supply (only gas);*
b. *the level of risk attached to the investment is such that the investment would not take place unless an exemption is granted;*
c. *the infrastructure must be owned by a natural or legal person which is separate at least in terms of its legal form from the system operators in whose systems that interconnector will be built;*
d. *charges are levied on users of that infrastructure;*
e. *(only for electricity) since the partial market opening referred to in Article 19 of Directive 96/92/EC, no part of the capital or operating costs of the interconnector has been recovered from any component of charges made for the use of transmission or distribution systems linked by the interconnector;*
f. *the exemption is not to the detriment of competition or the effective functioning of the internal electricity/gas market, or the efficient functioning of the regulated system to which the infrastructure is connected.*

With regard to requirements (a) and (b), it is rational to assume that the exemption cannot be applied to companies with dominant position on the market. This is also true in any case where granting an exemption would create or reinforce a dominant position, even though the new investment is for an infrastructural improvement that is very expensive or high-risk (requirement b). New infrastructural components tend to be very expensive when all its sub-components would, if underwritten by regulated tariffs, significantly increase the final customers' bill. The DG TREN Note on exemptions from certain provisions of third party access (2004) provides an example of such an expensive investment—that is, one with a capital cost of more than 10 Euros per connected customer. If the project costs were to be passed onto 20 million households through transmission tariffs, the total amount, some 200 million Euros, constitutes a major investment project. What constitutes a high-risk investment? In general, risk, is the possibility of sustaining damage or loss. High-risk investments are assumed to have a significant possibility that their value will drop to zero. To simplify, risk is a measure of the unpredictability of return on investment. Such unpredictability might be a result of variations in consumption, alternative investments, changes in world market conditions for primary fuels, or the long amortization period for such types of investment. The DG TREN Note adds that a risky investment is one in which the capital invested into assets cannot be recovered and re-used for a purpose other than the original one.

Needless to say, the European Commission must be notified of any and all refusals and exemptions from the requirement to provide third party access. In addition, no exemption granted on the basis of new investments from the gas directive or electricity regulation automatically exempts a company from the laws governing competition. In other words, a company to which an exemption has been awarded is still subject to EU competition rules, especially articles 101 and 102 of the EU Treaty (former articles 81 and 82 of the EC Treaty), but also to any associated domestic competition laws as well.

5. Equal access to the energy infrastructure in practice. Comparison between France, Great Britain, Germany and Poland.

Ensuring equal and non-discriminatory access to networks, which is key if open and competitive markets are to evolve, to some degree has been achieved throughout unbundling (legal and functional). Although progress has been made since 2004, unfortunately only ownership unbundling of the transmission system operators seems to have the capacity to further improve third party access to networks. Research done by Nowak (2009a) has shown that where a DSO or a TSO is a legal entity within an integrated company without separation of assets (ownership unbundling), three types of problems arise. First, in many cases system operators treat their affiliated companies better than competing third parties—for instance, by using network assets to make entry to the network more difficult for competitors. Second, non-discriminatory access to information cannot be guaranteed, since there is no effective tool to prevent a TSO or DSO from releasing sensitive market information to the generation or supply branch of the integrated company (Newbery, 2007). Third, investment incentives within integrated undertakings are distorted, since vertically integrated system operators have no incentive for developing the network in the interests of all market players, thus competitors as well. Such behavior leads to market segmentation where access to the networks is reserved only for the member of the group. As a result, ownership unbundling where transmission or distribution companies would own the infrastructural assets and no significant stakes in supply and generation seems to be the best available solution for ending discriminatory practices with regard to non-discriminatory third party access, at the same time increasing competition in the market.

However a heated debate over the ownership unbundling which constitutes one of the key amendments (although not mandatory) proposed in the Commission's third legislative energy package signifies that the ownership unbundling is a controversial issue. In the view of the Commission and such Member States as the United Kingdom and the Netherlands, the most radical option for ownership unbundling would increase competition and clear the path for greater energy sustainability and security of supply (Nowak, 2009b). However, the push for ownership unbundling has brought strong opposition not only from the companies affected, such as E.ON and RWE or EDF and GDF, but also from the governments of Germany and France (Hauteclocque and Rious, 2009). Due to the structure of their industries and the strong national orientation of the sectors, the two countries advocate a third form of ownership unbundling based on the so-called Scottish model of an independent system operator (ISO).[15] Both countries oppose ideas to force private companies to sell their property as it is legislatively forbidden in the EU, as they claim. Main argument raised in this regard involves the principle of subsidiarity in conjunction with article 345 of the EU Treaty, which states:

[15] Under ISO model, all the functions of system operator are removed from the bundled company, leaving the bundled company only with ownership of assets, thereby respecting the principle of the protection of the right to property. Supply/generation companies could no longer hold a significant stake in the independent system operator.

This Treaty shall in no way prejudice the rules in Member States governing the system of property ownership.

Some interpret this article as prohibiting the Commission from offering any proposal for ownership unbundling. In this regard Hancher (2005) argues that article 345 of the EU Treaty, which recognizes the right to property, casts doubt on the legality of any proposal for ownership unbundling from the Commission with regard to gas and electricity network industries.

Such reasoning is legal and logical. However, it fails to address the context in which it is operational—namely, the context in which natural monopolies use their subsidies of their network operations to diminish competition in the gas and electricity market. In other words, by subsidizing those parts of their holdings that are not ownership unbundled—for example, their distribution system operations—national incumbents can influence access to the network system and thus block new entrants.

The unbundling that has been envisaged would rely on competition law—in particular, on the analogy to the provisions concerning mergers and acquisitions, whereby the transfer of ownership would go through only if certain conditions or remedies are met. Similarly, in ownership unbundling the legislation would demand the selling of transmission or distribution assets to a non-network company, which would entail negotiating a fair-market selling and purchasing price (Nowak, 2009b). The idea of ownership unbundling is not to take away properties or harm the affected companies but to foster competition in those segments of the market in which natural monopolies have arisen.

Insufficiencies of functional and legal unbundling of distribution system operators are a major concern. DSOs still discriminate between their own supply companies and new entrants, which are limited in number. As a result, third party access is limited by incumbents taking advantage of their dominant positions in their domestic markets. However, what should be underlined and seen as a step in right direction is the fact that basic and universal principles of non-discrimination and access tariff structure have been implemented into the domestic legislation of the majority of Member States. The most advanced country in providing third party access among the four compared countries is Great Britain. In Great Britain, reforms provided by British Electricity and Transmission Arrangements (BETTA) strongly influenced the autonomy of the TSOs with regard to network access. This has been mainly achieved through ownership unbundling of the transmission system operators (Trischmann, 2006). In fact due to the BETTA reforms, the National Grid Electricity Transmission (NGET) company (formerly the National Grid Company plc.), a subsidiary of the National Grid plc., took control of electricity transmission and became the system operator in Great Britain. Ownership of the transmission system, however, remained fragmented: in England and Wales it belonged to National Grid, plc. (listed on the London Stock Exchange); in Scotland it belonged to Scottish Power (SP) and Scottish and Southern Energy (SSE). NGET currently has no generation or supply affiliates and is actually prevented by law from having any, a circumstance that largely guarantees the independence of the operator from the competitive business (Newbery, 2005a). Additionally, NGET has full autonomy in deciding what assets are necessary to operate, maintain, and develop the network. Finally, the transmission license is submitted only to the legally unbundled NGET and not to the group National Grid plc. Last but not least, in the absence of the ownership links to generators or suppliers, system operator have rather limited incentives to discriminate between market participants. Similarly in gas sector where transmission activities of the National Grid Gas plc. are independent in view of its affiliation with the National Grid plc. First, as in the case of the electricity transmission license, the gas transmission license is held by a separate, legally unbundled company (National Grid Gas plc.) within the group. Second, neither NGG plc. nor the NG plc. is a vertically integrated company (meaning it involves generation transmission distribution and supply); moreover, no subsidiaries or affiliates have any supply and/or generation interests. Third, the fact that NG plc. is a privately owned company listed on the LSE and sold through public offerings, its interests are focused on satisfying shareholders rather than the vertical integrated group (which in this case is non-existent), largely diminishes the threat of discriminatory behavior with regard to network access (Bartholomew, 2005).

On the other side is Germany, where the situation is more complicated with respect to the gas sector. For years, the German gas industry was able to avoid implementing any network access model that did not take into consideration the interests of the incumbent network operators and their sales operations. The incumbents maintained that, for technical and commercial reasons, it was not possible to have one widespread network system. Because it is not possible to guarantee flexible gas flow between entry and exit points within larger areas (entry and exit capacities have to be booked at each market area), the incumbents argued that it was necessary to have as many as 19 different regional market areas (Nowak, 2009a). The incumbents also maintained that it was essential to allow individual booking of entry and exit capacity through a different system of network operators within one market area to keep the traditional contract relationships in place (*single-booking-mode*). The *Bundesnetzagentur* (BNA), however, rejected this dualism of systems; in other words, on 17 November 2006 the BNA simply banned the industry's preferred single-booking-model solution in a case launched by network users against three grid operators. Instead, the BNA advocated implementing, in line with German law, a system based on a *two-contract model or entry–exit model*, where network access is granted only on one entry and one exit contract, independent of the number of network operators involved from the entry point into the German system through the final exit point (Nowak, 2009a). The German gas market still faces significant problems in third party access—problems such as the lack of transparency with respect to physical, contracted, and available capacities; with balancing rules and storage capacities; and with the new entry–exit framework (ERGEG, 2007).

One way of determining whether third party access is operational in practice is to ask if a company/customer can switch its supplier. If a company has a high number of suppliers/traders to choose from, the implication is that the suppliers/traders have easy access to the networks and that this access is equal, transparent and based on well-defined tariffs. If the percentage of customers switching the supplier is low, the inference is that customers are locked into the regulated prices demanded by incumbents and that the number of new suppliers entering the market is rather low. As of 1 July 2004, industrial customers that consume a certain level of electricity/gas, and as of 1 July 2007 all customers, have been free to purchase energy from a chosen supplier.[16] However administrative opening of the market did not bring expected results with regard to equal access to the infrastructure. In fact, the customer switching rates in many Member States have been very low, a fact that suggests that third party access is limited. In France by 2006, only 59,200 electricity customers had changed supplier; this number represents only 13% of the total volume of consumption and a little over 1% of the number of customers. Many others have negotiated

[16] This deadline implies household customers, who are not part of research in this paper.

new contracts with their incumbent suppliers under the regulated prices. In the case of gas, as of 2006 only 14% of eligible consumption had changed supplier.[17] Again for gas, 2007 was supposed to be significant for those industrial customers who were seeking to choose a new supplier. Unfortunately, most customers did not switch but remained at the regulated prices offered by the incumbents, which for their part were under the supervision of GDF and EDF.

In Germany, switching rates for electricity are 41% for large industrial customers, 7% for commercial customers (small-medium industries and businesses). Unfortunately, reliable information on the number of customers who switched gas suppliers is unavailable. The overall switching rate in 2007 for very large industrial users was only 0.74%; for medium and small industrial users it was 0.12%.[18]

As of the end of 2006, in Great Britain's electricity sector approximately 50% of all customers (more than 50% of large industrial customers, more than 50% of small and medium industries and businesses) had changed suppliers. In the gas sector, suppliers other than incumbent supply 64% of consumers: they provide more than 85% of large industrial customers, more than 75% of small and medium industries and businesses (see footnote 18). These numbers indicate that the switching rates in Great Britain are higher than not only those in France, Germany, and Poland but than in all other Member States.

Poland has the lowest switching rates. As of the end of 2006, only around 20% of large industrial electricity users and less than 0.1% of small and medium industries and businesses had changed suppliers. No gas customer switching at all had taken place. According to the provisional statistics of URE, in 2007 only 63 industrial customers changed electricity suppliers, none in the gas sector.

One reason is that switching procedures are costly and complicated. They involve balancing rules set up by the PSE-operator and distribution system operators, high costs of metering systems introduced by number of distribution operators, and high costs of modernizing equipment in general. Another reason is that administrative burdens are heavy. These involve the need for expensive and complicated expertise for access to the system for renewable energies in the case of implicit(presumed) lack of capacity set by the operators. Finally, in practice lack of automated system for the exchange of necessary customer information between suppliers and distributors deter customers from changing a supplier.

In sum, third party access remains a significant problem among Member States. With the exception of Great Britain and Nordic countries preferential access for the companies linked to incumbents occurs in many EU states. This is a major barrier to the development of an open and competitive energy market.

High rates on switching the supplier in Great Britain are achieved mainly due to the structure of the British market which is highly competitive–price controls have been removed, market concentration is relatively low and ownership unbundling has been introduced, which fosters competition and non-discriminatory third party access to the networks. In fact system operators have no incentive to discriminate in favor of their supply affiliates since they do not poses such affiliates-the licensee may only conduct transmission or distribution business. On the other hand in countries, which are dominated by relatively few companies so-called national champions (such as Germany, France or Poland), consumers are resistant to switching. Further on as precisely observed by Jamasb and Pollitt (2005) although market structure is important in promoting competition, appropriate regulation, in particular implementation of third party access to networks is important for effective competition. This on the other hand demands independent energy regulatory agencies with significant power over the energy market, especially power over access to the infrastructure (Joskow, 2006b; Nowak, 2006; Hogan, 2002). In fact in a comparative study on national regulators in the European Union, Hoff (2007) as well as Gilardi (2003) observe that although there are variations in the degree of independence of energy sector regulators, they tend to be more independent than regulators in other infrastructural sectors, and comparable to those of the telecommunication. Additionally, incentive-based regulation of networks can promote efficiency and cost savings in transmission and distribution. In Germany, where there has been no independent regulator in place and, hence an absence of incentive-based schemes, the network charges have largely remained unchanged and were among the highest in Europe until 2005 (Jamasb and Pollitt, 2005). Moreover it soon became clear that the high grid charges, discrimination with respect to access to the distribution infrastructure, and high transaction costs of the negotiated TPA were key problems for the German model, in particular, because of the hundreds of regional or local distribution companies (Haas et al., 2006). Also as pointed out by Glachant et al. (2008) it was hard to believe that the transmission networks could have been open to access by third parties only with negotiated TPA regime and without independent regulator. There should be no doubt that national regulators must ensure equal treatment of all market players in order to achieve a high level of competition within a single European electricity and gas market. Although it is possible to foster competition in the generation/production and supply sections of vertically integrated companies, it is harder to do so with respect to transmission and distribution. Therefore, because networks are crucial infrastructure for any company wishing to compete in the gas and electricity markets, and because non-discriminatory conditions for network access must be satisfied, a sector specific regulator with power over tariffs, network access, and dispute resolution is indicated (Nowak, 2009a).

Germany's refusal to establish an independent regulatory body, relying instead on *ex post* actions taken by the competition authority *Bundeskartellamt*, was criticized by other Member States and interested parties. Germany eventually established (in July 2005) its energy regulatory body, the *Bundesnetzagentur*–BNA (Brunekreeft and Twelemann, 2005). Since that time moderate change in networks charges has been observed. The new Energy Act in Germany (entered into force on 13 July 2005), established not only regulatory agency, but it also implemented regulated third party access using some ex ante incentive-based approach to control network charges, which indirectly increased switching rate among consumers. In fact as pointed out by Newbery (2005b) Germany is very good example of the consequences of failure to properly unbundle and regulate access to the transmission and distribution segments, with their owners collecting profits in the monopoly segments while engaging in a margin squeeze in the competitive segments of production and supply, preventing entry for new players and facilitating increased concentration.

Although Germany claimed that it significantly opened its electricity and gas markets to competition back in 1998, neither sector is very competitive. Indeed, in both markets there is a high degree of vertical integration and dominance by a few large companies. The electricity sector is dominated by four companies (RWE, E.ON, Vattenfall, and EnBW), which together control 90% of generating capacity, almost the entire transmission network, and

[17] Data gathered (for the purpose of PhD degree) during the stage at the European Commission DG TREN, Unit D-1. All data were prepared for the European Commission by the National Technical University of Athens.

[18] Data collected (for the purpose of PhD) during the stage at the European Commission DG TREN, Unit D-1. All date was prepared for the European Commission by the National Technical University of Athens.

half of the supply market. As in France and Poland, this control indicates vertical and horizontal concentrations across the market and constitutes a major barrier to competition. ERGEG (2007) statistics suggest that, although many new suppliers (mainly regional and local) have entered the market, this number has sharply fallen in recent years; indeed, many suppliers have withdrawn their operations. Germany has not sufficiently unbundled its companies; the interests of TSOs remain influenced by the supply interests of incumbent companies, especially in the case where the network access for new entrants is limited. The gas market, like the electricity market, is dominated by vertical integration and concentration with large numbers of regional and local suppliers directly or indirectly owned by the incumbents. E.ON-Ruhrgas, RWE, VNG, Wingas, and BEB are the main players on the gas market; they have acquired the whole transmission system and a significant share of the distribution and supply system. As in Poland, competition between suppliers is significantly limited due to lack of access by alternative suppliers to gas production and storage sites and due to long-term contracts between incumbents and suppliers. Cross-subsidies are very much still in evidence. Moreover, electricity and gas prices in Germany are among the highest in EU.

In fact, three out of four compared national electricity and gas markets still suffer from a lack of liquidity and transparency, conditions that hinder the efficient allocation of resources and that block new entrants. Currently, incumbents in German, France, and Poland are responsible for the greatest part of electricity and gas flows, own major portions part of the infrastructure assets, and generally have more and better access to information than new entrants. As a result, in those countries third party access is still significantly hampered. Additionally, the switching rates for large and small businesses customers are low in Germany, France, and Poland, with most customers remaining with incumbents under regulated prices. Since the customers are still obliged to choose a supplier that is based in their country, there is yet no common European electricity and gas market.

6. Conclusions

Effective competition in the energy market requires that the system operators or the owners of networks must allow any electricity or gas supplier equal access to these networks. Transmission and distribution system operators, thus are obliged to offer their services to all users on a non-discriminatory basis. They must offer the same service to different users under identical contractual conditions (nature, duration, etc.). Effective and non-discriminatory access by third parties to the networks (in gas sector, also to storage and LNG terminals) is an essential condition for the existence of a genuine and competitive internal energy market in the European Union. With regard to competitive internal energy market, the EU needs to foster not only legal developments, but it also have to support the construction of storage and network infrastructure in the Member States. Additional infrastructure, also interconnectors must be built to strengthen the existing networks and ensure the development of cross-border trade. At present the existing national legal frameworks do not allow independent, transparent, and efficient regulation of cross-border issues relating to gas and electricity network access. Currently the EU is unable to guarantee any EU company the right to sell electricity or/and gas in any Member State on equal terms and without discrimination. Further, in its Communication Note on prospects for the internal gas and electricity market (2007), the European Commission acknowledged that the preferential access granted to cross-border interconnectors demonstrates the shortcomings of the current regulations. Additionally, the functional and legal unbundling of network operators remains a significant problem. Insofar as they remain vertically integrated, they directly block equal access to the networks for all independent suppliers, especially in distribution, where legal separation was not required until 1 July 2007. Unless ownership is separated, the current unbundling rules will not remove the incentive for a company's cross-subsidization of itself or for discriminating against those competitors seeking third party access (by creating unnecessary technical barriers, maintaining artificially small balancing zones, or not making unused capacities available). As a result, ownership unbundling where transmission or distribution companies would own the infrastructural assets and no significant stakes in supply and generation seems to be the best available solution for ending discriminatory practices with regard to non-discriminatory third party access, at the same time increasing competition on the market. In the present globalized business environment, ownership unbundling might not entail a pure separation of transmission or distribution assets. Instead, ownership unbundling might involve more sophisticated arrangements. For example, such unbundling might permit a company to have a certain non-controlling share (a minority interest of perhaps up to 10% of shares) in both a transmission or distribution system operator and in a supply or generation company. Such a minority shareholder would not have blocking rights in either company, it could not appoint members of their boards, and it could not have any of its own people serve as a member of the boards of either company. In other words, the precise way in which unbundling occurs can be quite varied. The key is to prevent conflicts of interest and enable non-discriminatory access of all suppliers to the energy infrastructure.

In fact lack of equal and transparent third party access to networks creates an enormous entry barrier for new players and severely hampers the development of a competitive energy market. To ensure an independent energy infrastructure service thus became the important policy issue in the internal energy market project of the European Union, challenging in the same way dominant for years structure of vertical integration.

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