3. Energy Charter, Energy Strategies, Energy Directives, Energy Laws

Liberalization process creates an open access environment that will allow consumers to choose a provider for electric energy. In this environment customers will have the option of choosing the level of service reliability which will provide greater incentives for short and long term efficiencies, than are provided by economic regulation. The competitive forces will improve economic efficiency by further expanding the geographic horizon in the operation of the interconnected generation and transmission systems. The objective behind power system liberalization is to increase the competition, and thereby also the economic efficiency in the operation of the electrical power system. One important consequence of the liberalization is that the traditional regulated utilities shift their focus from cost minimization to profit maximization in the segments of their operation, where competition is introduced. Competition on the market is a simple and efficient means of guaranteeing consumers products and services of excellent quality at competitive prices. Suppliers (producers and traders) offer goods or services on the market to meet their customers' demands. Customers seek the best deal available in terms of quality and price for the products they require. The best deal for customers emerges as a result of a contest between suppliers.

The main reason for Europe to start the liberalization process in energy sector was the competition with the United States of America. The electricity prices for industry were 40% higher than in US, so the industry products were not so competitive. The process of European integrations and opening of East Europe to market forces have made it possible to start liberalization processes in energy sector (especially electricity and gas sector) through Directives and Regulations, among which today Directive 2003/54/EC and Regulation 1228/2003/EC are the most important for electricity sector. The Energy Charter process has been introduction to liberalization process in energy sector. European energy strategy has supported the vision on this field.

The new electricity and gas Directives were due to be transposed by Member States by July 2004, and the Regulation on cross border electricity exchanges also came into effect. The new rules are aimed at achieving a competitive electricity and gas sector across the whole European Union, as envisaged by the Lisbon Council objectives.

3.1. Energy Charter process

The roots of the Energy Charter[1] date back to a political initiative launched in Europe in the early 1990s, at a time when the end of the Cold War offered an unprecedented opportunity to overcome the previous economic divisions on the European continent. Nowhere were the prospects for mutually beneficial cooperation between East and West clearer than in the energy sector. Russia and many of its neighbours were rich in energy resources, but needed major investments to ensure their development, whilst the states of Western Europe had a strategic interest in diversifying their sources of energy supplies, thus reducing their potential dependence on other areas of the world. There was, therefore, a recognized need to ensure that a commonly accepted foundation was established for developing energy cooperation between the states of the Eurasian continent. On the basis of these considerations, the Energy Charter process was born.

The Energy Charter Treaty (ECT) provides the broadest multilateral framework of rules in existence under international law governing energy cooperation. In a world of increasing globalization and inter-dependence between net exporters of energy and net importers, it is widely recognized that multilateral rules can provide a more balanced and efficient framework for international cooperation, based on the principles of open, competitive markets and sustainable development. The fundamental aim of the Energy Charter Treaty is to strengthen the Rule of Law on energy issues by creating a level playing field of rules to be observed by all participating governments, thus minimizing the risks associated with energy-related investments and trade. So, the mission of the Energy Charter process is to strive towards open, efficient, sustainable and secure energy markets, as well as to promote a constructive climate conducive to energy interdependence on the basis of trust between nations.

The Treaty's provisions focus on five broad areas: the protection and promotion of foreign energy investments based on the extension of national treatment, or most-favoured nation treatment (whichever is more favourable); free trade in energy materials, products and energy-related equipment, based on WTO rules; freedom of energy transit through pipelines and grids; reducing the negative environmental impact of the energy cycle through improving energy efficiency; and mechanisms for the resolution of State-to-State or Investor-to-State disputes. This will be achieved through:

- strengthening and extending the rule of law to facilitate market developments in the energy sector,
- establishment of rules of conduct, guidelines, standards and recommendations for open efficient and sustainable energy markets,
- developing clear, commonly-accepted rules on energy transit.

The ECT extends the WTO rules to trade in the energy sector between WTO and non-WTO members and to energy trade among non-WTO members ("WTO by reference" approach). The trade rules cover energy materials, products (such as coal, crude oil, natural gas and electricity), and energy-related equipment. They only cover trade in goods

[1] The term "Energy Charter process" is used below to cover all obligations contained in, and activities relating to, the 1991 European Energy Charter; the 1994 Energy Charter Treaty (as amended by the 1998 Trade Amendment); and the 1994 Energy Charter Protocol on Energy Efficiency and Related Environmental Aspects.

- not trade in services – and do not extend to trade-related intellectual property rights. The ECT has established procedures for the settlement of trade disputes.

The ECT promotes investments in the energy sector by protecting foreign investors against the most important political risks in the host country (discrimination, expropriation, losses resulting from strife, transfer restrictions, breach of individual investment contracts). The ECT contains a comprehensive dispute settlement mechanism, covering both investor-state arbitration and inter-state arbitration. It includes a "best-efforts" clause concerning non-discrimination in the pre-establishment phase (i.e. the making of an investment), and provides for negotiations to transform it into a legally binding obligation.

The ECT obliges parties to facilitate energy transit on a non-discriminatory basis. It explicitly covers grid-bound energy transport and does not oblige parties to grant third party access. The ECT provides for a special conciliation mechanism in case of transit disputes. The existing provisions are to be supplemented, extended and modified by a legally binding Transit Protocol that is currently being negotiated. Non-legally binding model agreements (both intergovernmental agreements and agreements between host governments and private companies) are being developed as guidelines for individual energy transit projects.

The ECT promotes access to and transfer of energy technology. It acknowledges the importance of competition and open capital markets. It also confirms the principle of national sovereignty over natural energy resources. The ECT includes obligations of parties concerning environmental protection when exploring, exploiting and using their energy resources. It establishes the principle of transparency concerning energy-related legislation of parties. The ECT does not, in principle, deal with taxation matters. However, it protects foreign investors against confiscatory taxes. It obliges parties to ensure that their state enterprises respect the provisions of the Treaty. The ECT confirms that parties are responsible for the observance of the Treaty by their sub-national authorities. It includes general exceptions (e.g. concerning the protection of life and health, essential security interests, or concerning emergency energy shortage situations).

More on Energy charter process can be found on internet site www.encharter.org.

The cooperation between the EU and Croatia will reflect the principles of the market economy and the European Energy Charter Treaty, and it will develop with the view to the gradual integration of European energy markets. The cooperation shall, in particular, include the following:

- the formulation and planning of energy policy, including modernization of infrastructure, improvement and diversification of supply, and improvement of access to the energy market, including facilitation of transit, transmission and distribution, and the restoration of electricity interconnections of regional importance with the neighbouring countries;
- the management and training for the energy sector, and transfer of technology and know-how;
- the promotion of energy saving, energy efficiency, renewable energy and studying of the environmental impact of energy production and consumption;
- the formulation of framework conditions for restructuring of energy companies and cooperation between undertakings in this sector;

- the development of a regulatory framework in the field of energy in line with the EC ***acquis***.

3.2. European Energy strategy in liberalized energy market – focus on trading

The European Union is currently creating the most open and integrated single electricity and gas market in the world. The objective of creating the internal market in energy is to make the economy more competitive. This is based on a common approach to liberalization comprising gradual openness, essential transparency measures, public service obligations, official forums for regulatory bodies, common principles for transmission tariffication, and a pan-European infrastructure plan. The aim is that from 2007, every citizen is able to choose his electricity and gas supplier.

The internal energy market, if it functions in an integrated and competitive way, should efficiently deliver secure supply, via a larger market with a variety of suppliers, more flexibility on the supply and demand sides, more effective price signals, competition-inspired efficiency gains and innovation, etc. However, this represents an ideal situation. Some note that security of electricity supply in particular is an ongoing concern. Comments on what still needs to be done include further development of cooperation among regulators, among TSOs, more adequate infrastructure across an enlarged Europe, and attention to investment trends.

Many comments relate to the EU energy system as a whole (diversity of sources, value of local sources, complementary use of different technologies etc). The EEA EFTA States say that their part in the internal energy market is not completely recognized in the Green Paper. The idea of a level playing field is mentioned frequently, mainly understood as access of new energy service providers to the market and internalization of external costs. The EU role is emphasized here, especially competition and state aid rules, taxation, the Renewables Directive, and the EU frameworks for market-based environmental instruments, notably emissions trading, green or renewables certificates etc.

Some contributors, notably the European Parliament, call for an energy chapter in the Treaty. Others consider existing Community competences sufficient. The Green Paper idea that the internal energy market, along with enlargement and Kyoto, create a new context for energy policy decisions in Europe, is widely accepted. Some contributors believe that the market, driven by needs for short-term profits, may not accommodate investments for shared or longer-term needs (e.g. reserve and new capacities) and conclude that some re-regulation will be necessary. Some Member States regard themselves as responsible for safeguarding a minimum generation capacity. Some contributors deem that liberalization and market forces may conflict with protection of the environment, as well as social justice and security of supply. Some believe that social aspects, including employment effects, deserve more consideration. The others raise the idea of public service objectives for quality of service, preventing exclusion. Some link them to investments (reserve capacities, diversity etc.) and the question of who the supplier of last resort should be.

Some contributors advocate further development of commonly agreed targets for energy efficiency, renewables etc. Many, referring to the subsidiarity principle, underline the need for flexibility to accommodate national differences as regards climate, traditions etc. Member States must retain enough freedom in order to develop appropriate

instruments. Several contributors note that choices about energy mixes should be left to each Member State.

The EU role in external relations, widely supported by contributors as beneficial in the global market and geopolitical relations, also reflects internal energy market development and enlargement. Several contributors are concerned about the issue of long-term gas contracts, arguing that they are essential for financing the investments, needed to secure supply from third countries.

The internal energy market contributes to establishing healthy competition, guaranteeing the safety of energy supplies, reinforcing the competitiveness of the European economy, and requires a better use of existing cross-border capacities. A possible power blackout (like those in California and Italy) in the internal market is avoided by rules governing investment, competition and access to resources and transport networks, which protect against this type of breakdown. To refute a common misconception, the internal energy market does not only seek to reduce prices for consumers, but to set a fair price in compliance with the public service obligations. An evaluation of the openness of markets was carried out at the request of the Stockholm European Council (benchmarking). This report confirms one of the main themes of the Green Paper, the need for more openness in the electricity and gas market, coupled with the new needs for regulation and evaluation.

Trade within the European Union - in the case of electricity still only 8% of production - is suffering from a lack of interconnection infrastructures. As the Barcelona European Council pointed out, improving the use of existing networks and completing missing links will help to improve the long-term security of supply. In this regard, as stated in the Green Paper, the Commission has proposed a European plan for the development of gas and electricity infrastructures and priority co-financing, within the trans-European networks budget, of a dozen interconnection projects declared to be of European interest. Generally speaking, the Barcelona European Council has taken a decisive step towards completion of the internal energy market, especially in decisions to guarantee industrial and commercial consumers the freedom to choose their electricity and gas suppliers from 2004 onwards.

Given the profound changes in the energy markets in the European Union, both due to liberalization of energy markets and to environmental regulation, the costs of generation of electricity have changed. As it can be seen in Table 1, the cost of electricity generation is the lowest for combined cycle gas turbines, followed closely by energy generated from imported coal. Given the current subsidies to wind energy in many Member States, their generation costs are already fairly competitive. The generation costs of nuclear power are, however, about 40% higher than the cheapest alternative, gas. The figures do not include the negative environmental impact of energy generation.

The traditional monopoly holders in the natural gas and electricity sectors have planned ahead for the opening-up of the markets. In response to the competition, they have carried out extensive restructuring. As in other sectors of the economy, this is an unavoidable consequence of the internal market. Since 1998, mergers and acquisitions have gathered pace, particularly in the electricity sector. In the case of electricity, concentration appears natural for production and transmission activities, which are bound by network operation constraints and which, therefore, can capitalize on economies of scale.

Table 3-1. Electricity production costs - different technologies

Production costs	cents/kWh	Generation cost compared to gas (%)
Coal (imported)	3.29	3
Coal (domestic, with subsidies)	4.20	32
Gas (CCGT)	3.18	0
Nuclear	4.51	42
Wind (with subsidies)	4.46	40

Source: Annex 3 Notes: CCGT = Combined Cycle Gas Turbines.
The production costs of different Member States have been weighted by the amount of electricity produced. The costs are based on a utilization rate of 7000 hours per year

Beyond progressive establishment of tariff policies and charging the use of grids, underdevelopment of the transmission infrastructure poses a security of supply problem. Networking is of primordial importance for smoothing the operation of the internal energy market. The transmission system and "route" configuration play a central role in flexibility of supply (volume of trade) and consumer choice. In the past, the principal objective of interconnections was not to expand trade but to seek greater security of supply to soften the impact of one-off incidents. A lack of network infrastructure, as well as the maintenance of the quality of supplies (network stability), can slow the integration of national markets. Stimulation of intra-Community trading in electricity depends on the optimum use of the existing interconnections between the Member States. These must remain the focus of study from the aspect of competition rules. Separation of transmission from production has emerged as a key factor in creating the conditions for true competition and liberalization. In order to provide a framework for a fully open market, there is a need for a clearer separation of electricity generators from transport network managers, non-discriminatory network access by new generators and distributors, minimal charges for cross-border trade, clearer public service obligations and widespread establishment of an independent national regulator.

The case still remains that the European Union has made a significant progress in the energy area by using several instruments: the implementation of the internal energy market relies on the chapter dealing with the approximation of laws; the promotion of renewable energy on the basis of articles relating to environmental protection; or the development of gas and electricity networks in the context of the chapter on trans-European networks.

Overall, the situation regarding electricity generation adequacy in the Member States of the European Union is satisfactory. Although the year 2003 experienced some difficulties, the position in Italy and Spain has now improved considerably, as new capacity has been brought on line.

However, the Nordic countries still have a relatively tight situation[2]. Special measures exist in a number of cases to encourage investment in generation capacity. Many Member States have some form of explicit capacity payments, while Norway and Sweden also have a form of capacity option scheme. Others have some form of capacity support in the configuration of balancing markets or in the procurement of reserve capacity by the TSO. Finally, some Member States have used the possibility of a tender process. Development

[2] Based on data released by transmission system operators (e.g. System Adequacy Forecast 2004 – 2010, UCTE, December, 2003; UCTE System Adequacy Retrospect 2003, UCTE June 2004).

of interconnection is also required in a number of cases to ensure effective use of available generation capacity and to reduce the strain on the system caused by congestion at certain key bottlenecks. The European Union is still some way from the objective fixed by the European Council in Barcelona that cross border interconnections should represent at least 10% of production capacity in each Member State by 2005. It is for this reason that the Commission has proposed in the draft Directive on Electricity Security of Supply and Infrastructure, that the degree of co-ordination should be increased and the role of national regulators be enhanced in relation to the question of interconnections.

The Community is seeking to create a competitive market for electricity for an enlarged European Union, not only where customers have the choice of supplier, but also where all unnecessary impediments to cross border exchanges are removed. Electricity should, as far as possible, flow between Member States as easily as it is currently flowing within the Member States. The improved cross border flows will increase the scope for real competition which will drive economic efficiency in the sector, leading to benefits for customers both in the business and the household sector in terms of lower energy prices, improved service and products, tailored to their own needs. These benefits will feed through to higher overall economic growth in the European Union. Competitive electricity markets must deliver a secure, reasonably priced and continuous service to final energy customers. The electricity market will have to be carefully monitored and appropriately regulated, in order to ensure that this objective is delivered.

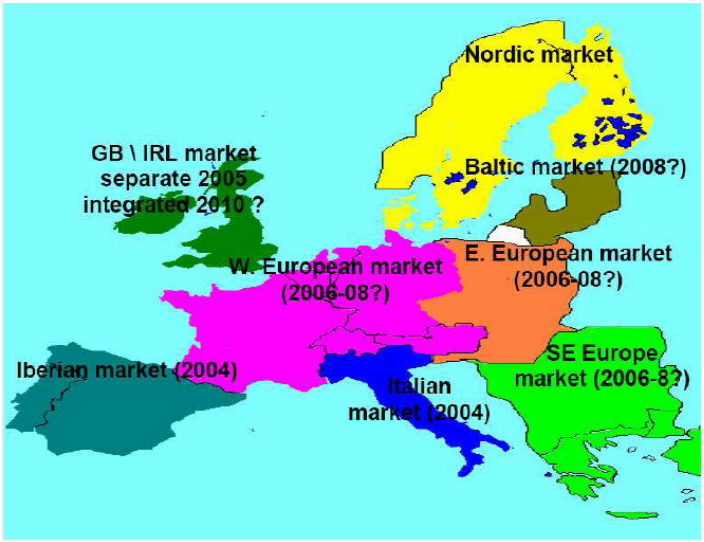

Figure 3-1. Potential Regional Electricity Markets within the EU

The overall goal is for the EU and wider market to function in the same way as a national market. Eventually, therefore, all system operators should use the same assumptions and mechanisms to manage their networks, and network users would face a single interface. Closer cooperation between system operators, across political and transmission network borders, unencumbered with potential conflicting interests regarding other competitive market activities, forms a key element for the achievement of this objective. Regarding tariffs, it is clear that for the medium term, an approach whereby tariffs for cross border trade are a combination of different national tariffs schemes, and where TSOs are compensated for transit and/or other cost inducing flows is the most sensible. However, in the longer term, a pan-European tariffication mechanism, may contribute to the further

integration of markets. For congestion management, and more generally for system operation, methods for allocating capacity should be market-based and designed to give correct locational signals to producers and consumers. Such price signals may also help regulators and/or investors to identify appropriate interconnection projects, depending, for example, on the volatility of the signals. Congestion management methods should also be non-discriminatory so that all participants should have an equal chance of obtaining capacity, whether it is for long term or short-term transactions, or for large or small customers. Finally, an automatically functioning use-it-or-lose-it rule should also exist. These objectives imply co-ordination of the congestion management process with that of day-ahead OTC and power exchanges, and eventually other wholesale markets, including the intraday and balancing market, as well as ancillary services. Such harmonization efforts imply a review of network security rules, grid codes, and access and tariff methodologies, such that trade within a region is as easy as trade within a country, or a TSO control area. Finally, in this context it is important to review the rules used by TSOs to deal with internal transmission congestion. TSOs should not, in general, be permitted to systematically transform internal constraints into constraints at borders. Reasonable balance must be drawn between the needs of national network users and those from other Member States. The incentives for doing this should be reduced, for example where incentives or penalties for dealing with internal constraints are equal to those for dealing with external constraints, bearing in mind the need to create consistent price signals in terms of reference to time and place on either side of the constraint.

3.3. Aims and intensions of the EU policy

Energy sector

The discussion is restricted to the opening of the gas and electricity markets, rather than oil and coal. The oil markets had already been competitive in most countries by the late 1980s/early 1990s, and they were not the object of much Community concern. In the case of coal, political debate has not concerned free trade of the product within the market, but almost exclusively the allowable level of subsidies that particular Member States want to grant their industries, whether as a means of avoiding excessive import dependency, or for delicate social reasons. With respect to gas and power, there have been three sets of Directives – first three Directives in 1990-1991, then in the 1996-1998 period two Directives taking the first steps to open the markets, which were followed in 2003 by two more Directives, extending the scope of their predecessors.

The 1990 price transparency directive

Price transparency was correctly identified as one of the preconditions for competition. The Directive required that all prices of gas and electricity to industrial end-users should be communicated to the Statistical Office of the European Communities (SOEC). In practice, this Directive was not fully enforced, and a number of large buyers still refuse to submit prices on grounds of confidentiality.

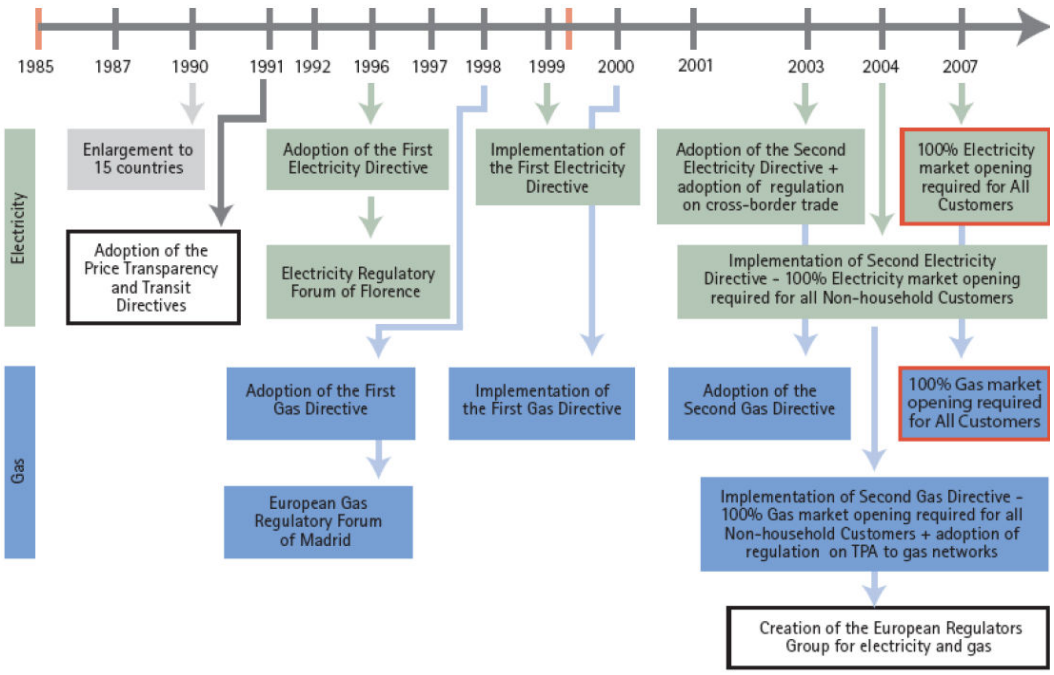

Figure 3-2. Activities concerning the Directives in gas and electricity

The 1990-1991 directives on the transit of gas and electricity

Two related Directives were adopted, one for electricity in 1990 and the other for gas in 1991, which required that Member States should take the measures necessary to facilitate transit of these two forms of energy. Transit had already been taking place where the commercial interest existed, and it is not known how much further transit activity was stimulated by this Directive.

The 1996 electricity directive and the 1998 gas directive

These Directives were very similar in scope and objective, so rather than cite the details of each, it is more helpful to set out the key provisions common to both of them. The Directives were designed to allow the third party access to the networks, which paves the way for new suppliers to enter the market, and removes exclusive franchises on a progressive basis, thereby allowing consumers to choose their supplier. They established the common rules for the production, transmission and distribution of electricity and gas, and laid down the detailed rules on the organization and functioning of the sectors, including production, market access, unbundling of accounts, the criteria and procedures that apply to invitations to tender, the granting of licenses and the operation of systems. The Directives' fundamental premise is that undertakings must be operated on a commercial basis, and may not be the object of discrimination as regards their rights or obligations, although Member States may impose public service obligations on them for the security, regularity, quality and price of supplies.

The Directives lay down the foundations for a European single gas and electricity market across six main axes:

- **Production:** the construction of new production installations is subject to a licensing or tendering procedure. The granting of licenses is subject to compliance with the criteria relating to the security and safety of systems, the environment, land use, public ground use, energy efficiency, the nature of primary energy sources and the technical, economic and financial capacity of the applicant. Reasons must be given for any refusal to grant a license and an appeal procedure must be established. The tendering procedure must be in accordance with the rules laid down in the Directive. Autoproducers and independent producers are not obliged to apply the tendering procedure and may obtain a license on the basis of objective, transparent and non-discriminatory criteria.
- **Operation of the transmission system:** a system operator designated by the Member States is responsible for the operation, maintenance and development of the transmission system and its interconnectors. The system operator controls the energy flows so as to maintain a secure, reliable and efficient system. The Member States lay down the technical requirements permitting interoperability of the systems.
- **Operation of the distribution system:** A distribution system operator designated by the Member States or by the undertakings responsible for the distribution systems is responsible for operation, maintenance and development of the distribution system. The distribution system operator must maintain a secure, reliable and efficient distribution system. He must refrain from any discrimination between the users. The Member States may require the distribution system operator to give priority to use of renewable energy sources.
- **Unbundling and transparency of accounts:** Undertakings must draw up, submit to audit and publish their annual accounts in line with the national rules implementing Council Directive on the annual accounts of certain types of companies. Integrated undertakings must keep separate accounts for their electricity generation, transmission and distribution activities.
- **Protective measures** may be taken in the event of a sudden crisis in the energy market, or where the physical safety or security of persons, apparatus or installations or system integrity is threatened.
- **Access to the system:** The Member States may organize access to the system in one of two ways:
    - Negotiated access on the basis of publication of the main commercial conditions for use of the system;
    - Regulated access on the basis of tariffs and / or other published clauses and obligations for use of the system.
    - Gas undertakings may refuse access to the system for the following reasons (duly substantiated reasons must be given for such a refusal):
        - A lack of capacity;
        - Public service obligations;
        - Economic and financial difficulties with take-or-pay contracts.
- **Public service obligations:** The Member states are allowed to impose on gas utilities, in the general economic interest, public service obligations which may

relate to security of supply, regularity, quality and price of supplies and to environmental protection.

Changes brought about by the 2003 electricity and gas directives

Although the fundamental spirit of the 1996 Electricity and the 1998 Gas Directives remained unchanged by the 2003 Directives, the latter introduced a series of measures directed towards speeding up the opening of electricity and gas markets and further stimulating competition (or rather, to further reducing the scope for uncompetitive practices). The main changes brought about by the Directives were:

- Full market opening was brought forward by 1 July 2007.
- Governments must now designate independent transmission and distribution system operators for gas and electricity networks, gas storage and liquefied natural gas (LNG) operations.
- Complete legal and functional unbundling of integrated transmission and distribution businesses, in addition to accounting unbundling, already required by the previous Directives. The Directive, however, includes provisions for exempting distribution system operators under certain particular cases.
- Mandatory regulated (rather than negotiated) third party access to gas and electricity networks and LNG facilities.
- Establishment of an independent energy regulator and other competent authorities in each Member State, particularly in its functions pertaining to supervising network access conditions.
- Strengthening of the public service obligations and consumer protection, including disclosure of information, the establishment of a last resort supplier, and flexibility in switching suppliers.
- Additional measures to ensure a secure supply of energy were introduced, including supply security monitoring, tendering for new capacity, reporting and demand side management for electricity; and the managing the trade-offs between supply security, public service obligations and network access refusal for gas.

3.4. European Directive 2003/54/EC

The Directive 2003/54/EC of the European Parliament and the Council of 26 June 2003 concerning common rules for the internal electricity market (hereinafter ***the Electricity Directive***) establishes the common rules for generation, transmission, distribution and supply of electricity. It lays down the rules relating to the

- organization and functioning of the electricity sector,
- access to the market,
- the criteria and procedures applicable to calls for tenders and the granting of authorizations,
- the operation of system.

Table 3-2. EU Electricity Directives (Source: Vasconcelos (2004))

	Most common Form pre-1996		1996 Directive		2003 Directive
Generation	Monopoly	→	Authorisation Tendering	→	Authorisation
Transmission **Distribution**	Monopoly	→	Regulated TPA Negotiated TPA Single Buyer	→	Regulated TPA
Supply	Monopoly	→	Accounting separation	→	Legal separation from transmission and distribution
Customers	No Choice	→	Choice for Eligible Customers (=1/3)	→	All non-household (2004) All (2007)
Unbundling T/D	None	→	Accounts	→	Legal
Cross-Border Trade	Monopoly	→	Negotiated	→	Regulated
Regulation	Government Department	→	Not specified	→	Regulatory Authority

The Electricity Directive gave deadlines for the full opening of the market – 1 July 2004 for all business customers, and 1 July 2007 for households. Correspondingly, it strengthened the independence of transmission and distribution system operators from other activities (production and supply), through legal and functional unbundling of these activities. This key piece of legislation also contains a number of obligations for national regulators. They must monitor the development of competition, levels of investment and, where appropriate, the level of prices. This should lead to greater transparency and give operators more ability to predict their evolution.

The Electricity Directive sets out basic rules, which the Member States have to incorporate into their legislation. In accordance with the subsidiary principle, the Member States are given a large scope of choice, as long as the different choices lead to equivalent economic results. The Directive does not impose a single rigid new market structure, but sets out the minimum conditions under which competition can develop in a fair and transparent way. It is therefore crucial that Member States transpose necessary legislation to implement the Directives as soon as possible. This Community legislation is only the framework that makes competition possible – further efforts must also be made to tackle the question of national dominant positions of the traditional suppliers.

3.4.1. Public service obligations and customer protection

In all European countries, special rules ensure that essential public service rules are respected by the electricity industry. These rules usually ensure that all citizens are guaranteed electricity at fair prices, and that the environment is protected. The Electricity Directive contains measures to ensure that these vital issues are provided for in the context of a competitive market place. Liberalization and public policy are not two contradictory imperatives. On the contrary, public service will and must play an important role in a liberalized market. This approach is clearly reflected in the Electricity Directive, which provides for a mechanism enabling Member States to pursue public policy considerations without, in normal circumstances, limiting the liberalization process. In this

light, the Member States may impose, on undertakings in electricity sector, public service obligations in the general economic interest which may[3] relate to the:

- security, regularity, quality[4] and price[5] of supply,
- environmental protection and
- energy efficiency and climate protection.

Such obligations shall be clearly defined, transparent, non-discriminatory and verifiable, and shall guarantee equality of access for EU electricity companies to national consumers. However, measures should be taken in the Member States in order to avoid a need to distort competition and slow down the genuine opening-up of the market. This is the principle that the Treaty (establishing the European Community) lays down, reflecting the basic rule that competition rules play an important part in boosting European integration (and therefore should be applied), while services of general economic interest must be sufficiently assured in a competitive context. In other words, public services should be adapted to the new challenges of liberalized markets, and should not be used as a pretext for foreclosing electricity markets from competition.

Supply of electricity to geographically isolated consumers at reasonable prices, obligations to provide unprofitable services, guaranteed electricity supply to the sick and the disabled, limits on the ability of electricity companies to disconnect customers due to debts, and ensuring continuity of electricity supply, are and will remain requirements that can be met in the context of a liberalized market. Governments can, for example, impose on their distribution companies an obligation to supply all their customers. In this sense a major area of concern in the past years has disappeared. Member States have the choice to impose such obligations on all operators in their country. The only restraint that the Directive requires is that these obligations should be objective, transparent and imposed on a non-discriminatory basis on all operators equally.

There is no single definition of the concept of public service in the Union. In some Member States the concept of public service as such does not exist. However, a common set of provisions exists in almost all Member States, designed to regulate the activities of electricity companies. These are defined either as:

- public service obligations, or
- as rules included in network codes to ensure the reliability of the network or
- general rules to ensure consumer protection.

They can be listed in three broad categories:

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3 The classification of a service of general economic interest is left, in accordance with the subsidiary principle, to the Member States but under the control of the Community level responsible for ensuring that the imposition of a public service obligations for carrying out such a service does not affect the developments of trade to such an extent contrary to the interests of the Community.

4 Quality is a very important concept as, by imposing quality standards, public authorities can affect the operation of the market.

5 This relates to the wish of the Member States to keep a certain amount of control over the level of prices and to maintain fairness between price systems.

- The first category relates to the universal service[6] and the overall protection of the consumer[7]. In this line, specific provisions exist in most Member States (Belgium, Germany, Denmark, Spain, Greece, the Netherlands, Austria, Portugal, Finland and the United Kingdom), laying down the obligations to connect customers and obligations to supply electricity on a regular basis to consumers. Some Member States (such as Austria) also lay down that consumers should be charged at reasonable prices, whereas in other countries (such as France and Greece) regulated tariffs apply to captive customers. Furthermore, special provisions are laid down in some countries (such as the United Kingdom) to protect the elderly and the disabled.
- The second category concerns the protection of the environment. Specific environmental constraints are laid down in some countries to ensure environmental friendly electricity production (Germany, Denmark, Greece and Austria for example), and support schemes for the use of renewable energy sources and combined heat and power systems are commonplace.
- The third category relates to security of supply considerations. This entails technical specifications for all those connected to the grid, maintenance of reserve capacity, matching supply and demand, availability of capacity to meet demand, securing primary fuels for electricity generation, and the maintenance of a secure and reliable system.

The Electricity Directive gives Member States a wide margin of discretion in deciding which public service objectives to pursue and how to meet them[8].

3.4.2. Labeling provision

The opening up of the electricity market in the European Union will gradually give all consumers a choice of supplier. This choice can be based on price, on quality and reliability of service, but can also relate to the generation characteristics of the electricity supplied. The Electricity Directive, therefore, introduces the obligation on suppliers to specify the fuel mix and its related environmental impact of the electricity they sell to final consumers. The objectives of this specification are fourfold:

- increase market transparency by providing open and easy access to relevant information,

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6 Universal service includes the right to be connected to the network, to be supplied with electricity and to benefit from high quality services. A nominated company may be required to supply all customers in a given geographic zone.

7 The protection of vulnerable consumers guarantees proper protection against any unjustified disconnection for elderly people, unemployed and disabled people, giving them a real "right to energy". Without this, competition could, for example, encourage electricity and gas suppliers to discriminate according to the risk of non-payment and only to supply the customers that they deem profitable.
Protection of final consumer relates particularly to transparency regarding contractual terms, for both electricity and gas. Thanks to increased transparency and real and guaranteed access to dispute settlement mechanisms, the position of consumers has been strengthened.

8 Nonetheless, the objectives pursued and approaches chosen by the Member Sates have been becoming increasingly similar. Experience to date indicates that, as competition takes hold, the Member States require (and the companies meet) increasingly high standards in this area. Furthermore, not only must companies meet the minimum standards legally required by the Member States, it is often in their commercial interest to exceed them. This continued increase in the quality of public service is one of the basic underlying objectives of the Electricity Directive.

- comply with the consumers' right to information regarding purchased products,
- enable consumers to make informed choices about suppliers based on the generation characteristics of the electricity they supply,
- educate consumers and stimulate electricity generation that contributes to a secure and sustainable electricity system.

Member States have two main obligations:

- ensuring that suppliers provide fuel mix information on, or with, the bill and environmental information on the fuel mix, at least in the form of information on reference sources, such as web-pages;
- ensuring that the information provided by suppliers is reliable.

In addition to the information on the breakdown of fuel sources used to generate the electricity supplied, the Electricity Directive requires that the consumers are informed of the environmental consequences, in terms of pollution, of the electricity they use. It requires that supply companies provide at least information on the amount of CO_2 and the radioactive waste that is generated by the electricity they use. Nonetheless, Member States are given the option to include additional environmental indicators. CO_2 emissions factors could be based on country averages initially, with a move towards plant-specific emissions factors in the near future[9]. CO_2 figures should be expressed in kilograms/kWh and radioactive waste should be expressed as micrograms/kWh. These figures could relate to the preceding year, like the figures on fuel source information. The provision to specify the fuel mix and its related environmental impact obliges Member States to achieve a certain result and leaves them the choice of form and methods. To ensure reliability of the system, it is necessary that Member States ensure that the information on both the generation attributes and the environmental information are verified at least on an ex-post basis. This task might be most appropriately carried out by a national regulatory authority.

3.4.3. Role of regulators

The transmission and distribution system operators are almost perfect monopolists. Electricity consumers have no real choice but to use the network connecting them to the grid for the delivery of their electricity. As a consequence, it is vital that these operators are subject to careful regulation; otherwise, where vertically integrated, they may actively discriminate in favour of their own group companies, limiting effective competition. In a similar manner, they may endeavour to charge excessive prices for transmission services, producing monopoly profits. This regulatory role is carried out in partnership between national regulators and competition authorities, and the European Commission, using the EU competition rules. The Electricity Directive itself requires that Member States set up a dispute settlement authority, independent of electricity companies. However, most Member States have chosen to establish an independent regulator, immediately and on a day-to-day basis independent of, but ultimately responsible to, the Government. The Electricity Directive does not necessarily require the regulator to be separate from existing

[9] This is especially indicated given the fact that as from 2005 in the framework of the Emissions Trading Scheme the emissions of the largest part of the electricity producers (all plant above 20 MW) will be available.

government structures, even though a separate regulator is the most common and desirable model. The Directive does allow for the possibility that a Regulator's decision can be reviewed by the relevant Ministry[10].

The regulatory authorities are required to ensure non-discrimination, effective competition and the efficient functioning of the market. This represents a key change compared to the previous legislation (Directive 96/92/EC) in that the new legislation firmly adopts regulated third party (rTPA) access as the basic model. Since the Electricity Directive states that there may be more than one regulator, it allows local regulators to deal with certain responsibilities. Furthermore, it is also possible for the Member States to use the same regulatory body as another Member State, for example by having a regional regulator. It may also be possible for one regulatory authority to deal with one issue, say network tariffs, and a different body to be established to deal with other issues, for example the requirements on unbundling.

The regulatory authority's core responsibilities are in the following items for which they must both monitor current practice and intervene if necessary:

- management and allocation of interconnection capacity,
- mechanisms to deal with congested capacity within the national system,
- the time taken by transmission and distribution undertakings to make connections and repairs,
- publication of appropriate information by transmission and distribution system operators concerning interconnectors, grid usage and capacity allocation to interested parties,
- the effective unbundling of accounts to avoid cross-subsidies, also the unbundling compliance programme, the terms, conditions and tariffs for connecting new producers of electricity, in particular taking a full account of the costs and benefits of the various renewable energy sources technologies, distributed generation and combined heat and power,
- overall compliance of transmission and distribution system operators with the Electricity Directive,
- the level of transparency and competition,
- approval of network access tariffs and conditions, including transmission and distribution and
- the provision of balancing services.

There is a clear demarcation that needs to be drawn between what the regulator needs to do in advance of tariffs entering into force, and what can be left to ex-post decision making. The key ex-ante function relates to the approval of methodologies used for network access charges and balancing regimes. Ex-ante decision on the methodology used to set tariffs must be based on a comprehensive understanding of the cost drivers of the regulated businesses so as to avoid excessive cost recovery and potential cross subsidies - e.g. an appropriate rate of return on that capital taking into account the low risk nature of

[10] More specifically, the Ministry should be permitted to either accept or reject the decision; it may not amend the decision of the regulatory authority.

a regulated business, an appropriate depreciation rate on these assets to be collected through annual revenues and the operating costs of the regulated business. Although network tariffs need to be cost reflective in a general sense, this does not necessarily mean there should be a rigid and automatic correspondence between the costs of the regulated business and the revenues collected from network tariffs. Regulators are likely, for example, to wish to provide incentives to improve efficiency or to encourage ongoing investment or extension of the networks. Some discussion of the investment needs will have to be conducted at the time when the overall price setting methodology is being approved by the regulator.

In addition, the regulatory authority must approve methodologies for balancing and retains the right to intervene on the market. Balancing markets are potentially subject to manipulation by dominant generators. Until 2010, the relevant authorities of the Member States have to provide, by 31 July of each year, a report on market dominance, predatory and anti-competitive behaviour to the Commission.

Furthermore, under the Regulation EC 1228/2003 on cross border electricity exchanges, the regulatory authority must:

- approve of operational and planning standards including schemes for the calculation of the total transfer capacity,
- decide on exemptions to normal access rules for new investments,
- ensure compliance with all guidelines adopted under the Regulation [6].

These constitute a minimum set of competences although the Member States may give the regulatory authority (or a different competent authority) additional powers to those specified. For example:

- issuing authorizations and licenses,
- monitoring of security of supply,
- organization, monitoring and control of the tendering procedure for generation and ensuring customer protection.

3.4.4. Generation

The Electricity Directive introduces full and complete competition across the EU for all new generating capacity. Thus, from February 1999, any producer is able to build a new power plant and generate electricity anywhere in the Community, either on the basis of:

- an authorization system or
- a tendering procedure.

The Electricity Directive permits Member States to choose between these two approaches when implementing the Directive (or any other procedure in terms of transparency and non-discrimination on the basis of published criteria which may relate to the safety and security of the electricity system, protection of public health, safety and environment, land use and siting, use of public ground, energy efficiency, the nature of primary sources, etc.).

Under an authorization procedure, any company may build and operate a new generation plant, provided that it complies with the planning and energy supply criteria for authorization specified in the Member State in question. Alternatively, under a tendering procedure, whenever there is necessity for new generation capacity on the basis of regular long-term planning forecasts, an independent body will draw up an inventory for new means of production and the requisite capacity will be allocated by a tendering procedure. Thus, the monopolies existing until now in many Member States for electricity generation will be exposed to competition. Whilst the Directive provides the choice for Member States between these two approaches for introducing competition into electricity generation, it is becoming clear that almost all the Member States have opted or will opt for the authorization procedure for the construction of new generation capacity. The reason for this trend developing in the EU is that this procedure represents the most transparent and effective mechanism to open up electricity generation to competition.

3.4.5. Security of supply

The process of market opening in the European Union started at a time with, generally speaking, excess reserve capacity in the system. One of the consequences of market opening and the drive for more efficiency in the sector is the closure of this excess of capacity. However, the costs to society of a shortage in the supply of electricity are much higher, as the electricity supply crisis in California has shown. On the peripheral markets of Ireland, Scandinavia, Italy, Greece and the Iberian Peninsula, a trend towards capacity insufficiency is visible at times. It is conceivable that generation inadequacy will develop on the core UCTE market as well, if no adequate measures are taken.

Member States shall ensure the monitoring of security of supply issues. Where Member States consider it appropriate they may delegate this task to the regulatory authorities. This monitoring shall, in particular, cover the supply/demand balance on the national market, the level of expected future demand and envisaged additional capacity being planned or under construction, and the quality and level of maintenance of the networks, as well as measures to cover peak demand and to deal with shortfalls of one or more suppliers. The competent authorities shall publish every two years, by 31 July at the latest.

Member States are responsible for ensuring that security of electricity supply is achieved. It is up to them to decide how they will apportion the rights and responsibilities to the different actors (regulators, transmission system operator, and electricity companies) to ensure that this goal is met. The Member States shall indicate to the Commission what measures they (intend to) take to ensure that a foreseen disruption in the demand / supply balance is addressed. To address any such situation, two main courses of action are open to Member States. The first set of options is geared towards ensuring generation adequacy by either constructing new plant, imposing capacity mechanism on players on the market, or by centrally maintaining a reserve capacity. The second set of options concerns measures on the demand side. Here it must be noted that the possibility of setting a price cap, for instance on supply to household customers, should be carefully weighed against the risks price caps entail in the sense that they might lead to distortion of any investment signal and could therefore turn out to be counter-productive.

If the monitoring exercise should demonstrate that a demand supply disruption is foreseen, intervention by the authorities on the market would be justified. However, given the fact that the internal market creates interdependence, with some Member States

importing significant parts of their electricity requirements, a European wide solution to the issue, or at least a combination of compatible solutions has to be found. The Member States would be advised to decide ex-ante what approach they intend to take in the case of a foreseen supply scarcity problem, because the market will need regulatory certainty to be able to function effectively. Indeed, the Commission now proposes that there should be a requirement on Member States to set out its approach to these issues[11].

3.4.6. Organization of access to the system

To enable the transport of electricity from producers to eligible customers[12] the Electricity Directive requires that the owners and operators of the electricity networks provide access to their lines to others. Implementation of the third party access (TPA) to the transmission and distribution systems is based on published tariffs, applicable to all eligible customers, and applied objectively and without discrimination between system users. The Member States shall ensure that these tariffs, or the methodologies underlying their calculation, are approved prior to their entry into force and that these tariffs, and the methodologies — where only methodologies are approved — are published prior to their entry into force.

The operator of a transmission or distribution system may refuse access where it lacks the necessary capacity. Duly substantiated reasons must be given for such refusal. Member States shall ensure, where appropriate and when refusal of access takes place, that the transmission or distribution system operator provides relevant information on measures that would be necessary to reinforce the network. The party requesting such information may be charged a reasonable fee reflecting the cost of providing such information.

3.4.7. Transmission system operation

Undertakings which own transmission systems will designate one or more transmission system operators (TSOs), with regard to efficiency and economic balance,. Each transmission system operator shall be responsible for:

- ensuring the long-term ability of the system to meet reasonable demands for the transmission of electricity,
- contributing to security of supply through adequate transmission capacity and system reliability,
- managing energy flows on the system, taking into account exchanges with other interconnected systems. To that end, the TSO shall be responsible for ensuring a secure, reliable and efficient electricity system and, in that context, for ensuring the availability of all necessary ancillary services insofar as this availability is independent from any other transmission system with which its system is interconnected,
- providing to the operator of any other system with which its system is interconnected sufficient information to ensure the secure and efficient operation, coordinated development and interoperability of the interconnected system,

11 Proposal for a Directive on Infrastructure and Security of Supply COM (2003) 764, Article 5.

12 Eligible customers are customers who are free to purchase electricity from the supplier of their choice in line with Article 21 of the Electricity Directive.

- ensuring non-discrimination as between system users or classes of system users, particularly in favour of its related undertakings,
- providing system users with the information they need for efficient access to the system.

3.4.8. Distribution system operation

Undertakings that own or are responsible for distribution systems shall designate, with regard to efficiency and economic balance, one or more distribution system operators (DSOs). Distribution system operators shall do as follows:

- maintain a secure, reliable and efficient electricity distribution system in its area with due regard for the environment,
- in any event, it must not discriminate between system users or classes of system users, particularly in favour of its related undertakings,
- provide system users with the information they need for efficient access to the system,
- when dispatching generating installations, to give priority to generating installations using renewable energy sources or waste or producing combined heat and power,
- procure the energy they use to cover energy losses and reserve capacity in their system according to transparent, non-discriminatory and market-based procedures, whenever they have this function. This requirement shall be without prejudice to using electricity acquired under contracts concluded before 1 January 2002,
- where DSOs are responsible for balancing the electricity distribution system, the rules they had adopted for that purpose shall be objective, transparent and non-discriminatory, including rules for the charging of system users of their networks for energy imbalance. The terms and conditions, including rules and tariffs, for the provision of such services by DSOs shall be established in a non discriminatory and cost-reflective way and shall be published,
- when planning the development of the distribution network, energy efficiency/demand-side management measures and/or distributed generation that might supplant the need to upgrade or replace electricity capacity, shall be considered by the distribution system operator.

3.4.9. Unbundling of transmission and distribution system operators

In Europe, the transmission and distribution networks were largely owned by vertically integrated electricity companies that generate, transport and sell electricity. These companies own an 'essential service', the network, which, under the new rules, they must offer on equal terms to its own company and to its competitors. However, in reality there is a clear risk that such companies will be tempted to discriminate in favour of their own group companies when granting access to the network. In order to ensure non-discriminatory access to the network and avoid conflicts of interest, it is necessary to separate the network business (natural monopoly) from those activities of vertically

integrated companies which compete on the market, i.e. production and supply. Achieving this separation is the purpose of the unbundling provisions in the new Electricity Directive, which are considerably strengthened in comparison to the previous directives. The unbundling requirements apply if the network business in question is part of a "vertically integrated undertaking". The basic elements of the new unbundling regime are summarized in Table 3-3.

Table 3-3. Application of unbundling rules to TSOs and DSOs

	Legal unbundling	Functional unbundling	Accounting unbundling
TSO	✓	✓	✓
DSO above 100 000 customers	Exemption possible until 1 July 2007	✓	✓
DSO below 100 000 customers	Exemption possible	Exemption possible	✓

The key message of legal unbundling is that transmission and distribution have to be done by a separate "network" company. However, the network company must not necessarily own the network assets but must have "effective decision making rights" in line with the requirements of functional unbundling. The obligation to create a separate company only concerns the network business, i.e. the natural monopoly. All other activities, i.e. the production and supply, can continue to be operated in a single company. The vertically integrated company is in principle free to choose the legal form of the network company, provided that the type of company selected provides for sufficient independence of the management of the TSO/DSO from the parent company, in order to fulfil the requirements of functional unbundling. As regards a combined TSO/DSO the Electricity Directive provides for an exemption from legal unbundling and contains an explicit provision allowing such a combined operation, provided that the accounts are unbundled and that the combined operator is functionally unbundled from other activities of the sector. By contrast, there is no explicit provision on the possibility of a combined network operator involving different sectors. Such a combined multi-sector operator should, nevertheless, be possible in principle, on the same basis as a combined TSO/DSO. The operation of different networks in one company does not bear high risk of discrimination and conflict of interests, provided that separate accounts are kept to ensure transparency and prevent cross-subsidization.

The provisions of the Electricity Directive on management separation (functional unbundling) in the first place require that the management staff of the network business do not work at the same time for the supply/production company of the vertically integrated company. This applies to both the top executive management and the operational (middle) management. Thus, for instance, managers of the transmission system should not sit on the board of directors of the vertically integrated company - the transmission part should act independently from the rest of the company. It remains however, possible for an executive director of the holding company to perform a supervisory function in the network company, without being involved in day-to-day decisions. All commercial and operational decisions related to the operation, maintenance and development of the network must be made within the network business, without involvement of the related supply business or holding company of the integrated company. This is of particular importance with regard to areas which may have an impact

on competition in the supply market, such as the extension or construction of interconnections with other systems. The above principles also apply in case the parent company remains the owner of the assets. In this case too, the basic decisions must remain with the network company, and the parent company may in principle be involved in the implementation of these decisions, providing that safeguards are in place ensuring that the parent company only executes decisions taken by the network company. Should the parent company not comply with this decision, the network company must have the possibility to intervene by means of step-in rights. Details shall be determined on a case-by-case basis and shall be laid down clearly in a specific arrangement. The requirement of effective decision making rights is without prejudice to the "economic and management supervision rights of the parent company, in respect of the return on assets in a subsidiary". Regarding the scope of this supervision rights, the Electricity Directive explicitly refers to two items: the financial plan of the network company, or any equivalent instrument, and its overall level of indebtedness. Regarding the limits of the supervision rights, the Electricity Directive is equally clear: any detailed day-to-day oversight of the network function by the parent company is not permitted, notably instructions regarding decisions on the construction or upgrading of lines, which do not exceed the terms of the financial plan. Within the scope of the approved financial plan, the network company shall have complete independence. Furthermore, the financial plan, whilst it can be adopted by the parent company, must be compatible with the requirement to ensure that the network company has sufficient financial means to maintain and extend the infrastructure available. The compliance program shall contain rules of conduct, which have to be respected by staff in order to exclude discrimination. It lays down in detail what kind of information is to be considered confidential in this sense and how it should be treated. The rules on functional unbundling are complemented by the obligation of transmission and distribution operators, to preserve the confidentiality of commercially sensitive information. At last, it should be noted that the functional unbundling measures contained in the Electricity Directive are "minimum criteria". Member States may thus consider to further complement the minimum set of criteria by further measures, with a view to ensure utmost effectiveness of unbundling under the specific national circumstances, in particular the national company law.

The provisions on accounting unbundling remain largely unchanged compared to the first directives. Given the new requirement of legal unbundling, which leads necessarily to accounting unbundling, they are under the new regime of particular relevance for DSOs which are not legally unbundled. It should be noted that, unlike legal and functional unbundling, no derogation is possible from accounting unbundling for smaller DSOs. Accounting unbundling is thus the minimum separation requirement to be respected by every network operator, without exception. Furthermore, until complete market opening, separate accounts have to be kept for sales to eligible and non-eligible customers, in order to avoid cross-subsidization of the former by the latter. The accurate application of accounting principles is at least equally important as the principle of accounting unbundling. It is vital that cost items are allocated to the activities concerned in a transparent and accurate way. Notably, any overstatement of the costs of the network business must be excluded. Such inaccurate cost allocation is likely to lead to cross-subsidization in favour of the supply business and would thus distort competition in the supply market. It must also be noted that regulatory authorities play a key role in this respect. They shall, through monitoring effective accounting unbundling, ensure that there are no cross-subsidies between generation/supply and transmission/distribution. It

should be noted, in this context, that incentive-based regulation ("price caps") of network access charges can be an effective instrument to considerably reduce the incentives and possibilities for integrated companies to shift costs from the supply/production business to the network business. Incentive-based regulation, apart from its other advantages, can thus be an effective instrument to reduce the risk of cross-subsidization.

3.5. Regulation 1228/2003/EC

The Regulation on conditions for access to the network for cross-border exchanges in electricity (hereinafter ***the Regulation***) is directly applicable European legislation. It has entered into force on 1 July 2004. It aims at setting fair, cost-reflective, transparent and directly applicable rules for cross-border exchanges in electricity. It shall enhance competition within the internal electricity market while taking into account the features specific to national and regional markets. This will involve the establishment of the following:

- a compensation mechanism[13] (tariffication) for cross border flows (trade, transit) of electricity,
- charges for access to networks (generators G or/and load L),
- the setting of harmonized principles on cross-border transmission charges,
- general principles of congestion management,
- the allocation of available capacities of interconnections between national transmission systems,
- provision of information on interconnection capacities,
- new interconnectors.

3.5.1. Compensation mechanism

Rules contained in the Regulation state that the transmission system operators should be compensated for costs incurred as result of hosting cross-border flows of electricity on their network. This compensation shall be paid by the operators of national transmission systems:

- from which cross-border flows and
- the system where flows end.

The magnitude of cross-border flows hosted, and the magnitude of cross-border flows designated as originating and/or ending in national transmission systems, shall be determined on the basis of the physical flows of electricity actually measured in a given period on the interconnections with the adjacent control blocks. The costs incurred as a result of hosting cross-border flows shall be established on the basis of the forward looking long-run average incremental costs taking into account:

- losses,

13 Cross-border trading mechanism (CBT mechanism).

- investment in new infrastructure,
- proportion of the cost of existing infrastructure (as far as infrastructure is used for the transmission of cross-border flows and in particular
- the need to guarantee security of supply.

When establishing the costs incurred, recognized standard-costing methodologies shall be used. Besides costs, the benefits that a network collects as a result of hosting cross-border flows shall be taken into account to reduce the compensation received.

The Commission shall adopt and amend guidelines on all previously anticipated issues:

- details of the procedure for determining which transmission system operators are liable to pay compensation for cross-border flows, including the split between the operators of national transmission systems from which cross-border flows originate and the systems where those flows end,
- details of methodologies for determining the cross-border flows hosted,
- details of the methodology for determining the costs incurred and benefits provided as a result of hosting cross-border flows,
- details of the payment procedure to be followed (including the determination of the first period of time for which compensation is to be paid) and
- details of the treatment in the context of the inter-TSO compensation mechanism of electricity flows originating or ending in countries outside the European Economic Area.

3.5.2. Charges for access to networks

Payments and receipts resulting from compensation between transmission system operators should be taken into account when setting national network tariffs. Both, producers ("generation", G) and consumers ("load", L) may be charged for access to networks. The proportion of the total amount of the network charges borne by producers shall, subject to the need to provide appropriate and efficient locational signals, be lower than the proportion borne by consumers. A proper system of long-term locational signals shall be based on the principle that the level of the network access charges should reflect the balance between generation and consumption of the region concerned, on the basis of a differentiation of the network access charges on producers and/or consumers[14].

The actual amount payable for cross-border access to the system can vary considerably, depending on the transmission system operators involved, and as a result of differences in the structure of the tariffication systems applied in the Member States. A certain degree of harmonization is therefore necessary in order to avoid distortions of trade. This objective cannot be achieved by the Member States only. By reason of the scale and effect

[14] Where appropriate, the level of the tariffs applied to producers and/or consumers shall provide locational signals at European level, and take into account the amount of network losses and congestion caused, as well as investment costs for infrastructure. However, this shall not prevent Member States from providing locational signals within their territory, or from applying mechanisms to ensure that network access charges borne by consumers ('load') are uniform throughout their territory.

of the action it can be better achieved at the Community level. Therefore, the Community shall adopt guidelines on appropriate rules for the setting of charges applied to producers and consumers (load) under national tariff systems, including the reflection of the inter-TSO compensation mechanism in national network charges and the provision of appropriate and efficient locational signals.

It would not be appropriate to apply distance-related tariffs, or, provided appropriate locational signals are in place, a specific tariff to be paid only by exporters or importers, in addition to the general charge for access to the national network. In other words, providing that appropriate and efficient locational signals are in place, charges for access to networks applied to producers and consumers shall be applied, regardless of the countries of destination and, origin, respectively.

3.5.3. Congestion management and the allocation of available capacities of interconnections between national transmission systems

Network congestion problems shall be addressed with non-discriminatory market-based solutions, which give efficient economic signals to the market participants and TSOs involved, and they shall preferentially be solved with non-transaction based methods. The maximum capacity of the interconnections and/or the transmission networks affecting cross-border flows shall be made available[15] to market participants, complying with safety standards of secure network operation. Market participants shall inform the TSOs concerned whether they intend to use allocated capacity, a reasonable time ahead of the relevant operational period. Any allocated capacity that will not be used shall be reattributed to the market in an open, transparent and non-discriminatory manner.

TSOs shall, as far as it is technically possible, net the capacity requirements of any power flows in the opposite direction over the congested interconnection line in order to use this line to its maximum capacity. Transactions that relieve the congestion shall never be denied. Transaction curtailment procedures shall only be used in emergency situations, where the TSO must act in an expeditious manner and redispatching, or when counter trading is not possible. Any such procedure shall be applied in a non-discriminatory manner. Market participants who have been allocated capacity shall be compensated for any curtailment (pro-rata method). Cross-border coordinated redispatching or counter trading may be used jointly by the TSOs concerned. The costs that TSOs incur in counter-trading and redispatching must, however, be at an efficient level.

Congestion management method(s) shall deal with short-run congestion in a market-based, economically efficient manner, whilst simultaneously providing signals or incentives for efficient network and generation investment in the right locations. No congestion management procedure, with significant effects on power flows in other networks, can be devised unilaterally because of an effect that the use of interconnection lines has on the power flows on at least two sides of a national border. The possible merits of a combination of market splitting, or other market-based mechanisms, for solving 'permanent' congestion, and counter-trading for solving temporary congestion, shall be immediately explored as a more enduring approach to congestion management.

The explicit auction system, if used, must be designed in such a way that all available capacity is being offered to the market. This may be done by organizing a composite

15 The available capacities of these lines should be set at the maximum levels.

auction in which capacities are auctioned for different durations and with different characteristics (e.g. with respect to the expected reliability of the available capacity in question). Total interconnection capacity shall be offered in a series of auctions, which, for instance, might be held on a yearly, monthly, weekly, daily or intra-daily basis, according to the needs of the markets involved. Each of these auctions shall allocate a prescribed fraction of the available transfer capacity, plus any remaining capacity that was not allocated in previous auctions. The explicit auction procedures shall be designed in such a way as to allow bidders to also participate in the daily sessions of any organized market (i.e. power exchange) in the countries involved. In order to offer as much capacity to the market as possible, the financial risks related to the netting of flows, shall be attributed to those parties causing those risks to materialize. Transport in a direction against the dominant power flow relieves the congestion, thus resulting in additional transport capacity over the congested tie line. In order not to risk creating or aggravating problems related to any dominant position of market participant(s), capping of the amount of capacity that can be bought/possessed/used by any single market participant in an auction shall be seriously considered. To promote the creation of liquid electricity markets, capacity bought at an auction shall be freely tradable until the TSO is notified that the capacity bought will be used.

Any revenues resulting from the allocation of interconnection shall be used for one or more of the following purposes:

- guaranteeing the actual availability of the allocated capacity,
- network investments maintaining or increasing interconnection capacities,
- as an income to be taken into account by regulatory authorities when approving the methodology for calculating network tariffs, and/or in assessing whether tariffs should be modified.

The level of the tariffs applied to producers and/or consumers, besides already mentioned issues, shall take into account the amount of congestion caused.

3.5.4. Provision of information on interconnection capacities

In order to ensure the security of networks in the context of congestion management, transmission system operators shall put in place information exchange mechanism with regard to the safety, operational and planning standards used. The published information shall include:

- a general scheme for the calculation of the total transfer capacity and the transmission reliability margin based upon the electrical and physical features of the network,
- estimates of available transfer capacity for each day (indicating any available transfer capacity already reserved),
- a quantitative indication of the expected reliability of the available capacity,
- security standards they will apply,
- standards which describe which congestion management methods they will apply under which circumstances.

The first three pieces of information shall be made at specified intervals before the day of transport and shall include week-ahead and month-ahead estimates.

3.5.5. New interconnectors

New direct current interconnectors may, upon request, be exempted from general rules of third party access contained in the Regulation and the Electricity Directive, with the effect that the infrastructure in question would not allow third party access at all, or if offered, then not necessarily on the basis of the published tariffs. An exemption may apply also, in exceptional cases, to new alternating current interconnectors provided that the costs and risks of the investment in question are particularly high when compared with the costs and risks normally incurred when connecting two neighbouring national transmission systems by an alternating current interconnector, as well as the existing interconnector with significantly increased capacity.

As the possibility for such exemptions is an exception to the general rule of third party access, which is the basis of the new competitive market for electricity, exemptions will, therefore, only be granted exceptionally and on a case-by-case basis. In other words, there will be no block exemptions for specific types of infrastructure, and all cases will be assessed on their merits. The exemption may cover all or part of the capacity of the new interconnector, or of the existing interconnector with significantly increased capacity. The individual criteria for exemptions are as follows:

- the investment must enhance competition in electricity supply,
- the level of risk attached to the investment is such that the investment would not take place unless an exemption is granted,
- 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,
- charges are levied on users of that infrastructure,
- since the partial market opening, 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,
- the exemption is not to the detriment of competition or the effective functioning of the internal electricity market, or the efficient functioning of the regulated system to which the infrastructure is connected.

In general, it will be expected that exemptions cannot apply where an existing dominant position is created or reinforced, or where the granting of an exemption reduces the scope for diluting existing dominant positions. Similarly, an exemption will not normally be considered when there is little chance of a similar competing piece of infrastructure being constructed which would provide a similar function, whether for geographical, engineering or economic reasons. Normally it will be expected that developers seeking exemptions will have, as far as possible, given other parties an opportunity to gain access to the new facility at the planning and feasibility stage, for example through an open season procedure. Alternatively, developers should create the possibility for a minimum level of third party access to the new infrastructure under the rules of the Directive for a certain proportion of its capacity. The scope and duration of the exemption should be

proportional to the objective being pursued. The granting of an exemption by regulators or Member States shall be motivated by their desire to protect customers against having to underwrite projects where the ratio of benefits to costs is uncertain, and where the cost is particularly high. The details of the exemption to be awarded should therefore be in proportion to these parameters. Finally, the exemption decision shall be notified, without delay, by the competent authority to the Commission, together with all the information relevant to the decision.

3.6. The ETSO 2005 Cross-Border Tariffication Mechanism

One of the early ETSO[16] (the Association of European Electricity Transmission System Operators) papers, dated 14 January 1999, is entitled International Exchanges of Electricity: Draft Rules Proposed by the European Transmission System Operators. Since that time a number of documents on cross-border trade of electricity have been posted on the Internet. The latest ETSO 2005 proposal for a Cross-Border Tariffication Mechanism is being implemented in the European Union since 1 January 2005. Except for UK, Ireland and Baltic countries, all EU Member States are participating in the new system, together with Switzerland and Norway.

The first objective of the proposed mechanism for 2005 is to compensate for the use of a national network by "Transit flows"; the latter being defined as flows resulting from energy exchanges, where injections and loads are located outside of the "Transited country". These transit flows will be determined on the basis of the physical flows actually measured at the interconnections between each CBT party in a given period of time. The 2005 mechanism proposal shall not compensate for flows in a country that are induced by imports and exports (also called compensation for all cross-border flows), as the costs related to their usage of a network can be included in the national tariff structures (and through any harmonized European tariff structure). The second objective of the 2005 mechanism is also to compensate for the "Losses" caused by transits. The general philosophy of the ETSO proposal relies on six main phases:

- within the overall costs incurred by a TSO, allocation of costs related to national transmission services and to cross-border exchanges
- computation of the total revenue needed at the European level to cover the costs related to cross-border exchanges
- computation of the value of the European fee by dividing the required total revenue by the sum of the expected programmed cross-border exchanges
- payment of the European fee
- collection of the TSO revenues

[16] In 1999, ETSO was created as an association with ATSOI, UKTSOA, NORDEL and UCTE as founding association members. However, on 29 June 2001 ETSO became an International Association, the Association of European Electricity Transmission System Operators, with direct membership of 32 independent TSO companies from the 15 countries of the European Union plus Norway and Switzerland. At the end of 2001 ETSO membership was enlarged to Slovenia and CENTREL countries as full and associate members respectively. The Czech Republic was admitted as full member in June 2003 and Hungary, Poland and Slovakia in 2004. The Estonian TSO has become ETSO Associate Member in September 2004 and the Lithuanian TSO in February 2005.

- redistribution of the collected revenues according to a measurement of the cross-border exchanges, based on hourly measurement of the energy flow at the tie-lines.

In order to be implemented, the ETSO proposal requires a harmonized definition of the following elements:

- identification method for the "Horizontal Network" (totally or partially used by cross border exchanges)
- cost accounting and allocation methods for the elements of the horizontal network
- method to assess, ex-ante, the cost of losses on the horizontal network
- method to assess, ex-ante, the volume of electricity that would be exported
- method for computation of the cross-border fee
- ex-post measurement and aggregation method for the volume of electricity exchanged between countries
- settlement method for year N and N+1 in case of differences between expected and real revenues.

The proposal relates, as the case so far, to the fair compensation for the use of national transmission networks by cross-border trade (transits). More particularly, the proposal does not affect or grant access to national networks (covered by EU directive and national legislations) nor does it cover capacity allocation and congestion management issues for which dedicated solutions are required. The ETSO proposal maintains the principles of an inter-TSO compensation that is function of the transit hosted by each country as measured from the flows on the interconnections with the adjacent control blocks. The proposal allows for some degree of subsidiarity in design of details. It is expected that the model will be further developed for 2006. ETSO will define more precisely the procedure to follow in 2006.

Given the positive experience gained since March 2002 with its inter-TSO compensation mechanism, ETSO believes that the 2006 mechanism and any other future mechanisms should maintain the main characteristics of the present system, that are: simplicity, transparency and efficiency.

3.6.1. Identification of the horizontal network (HZ)

The ETSO CBT mechanism supposes that the functions of the network can be split into three parts (Figure 3-3):

- access of the generation to the "Horizontal Network"
- access of the load to this "Horizontal Network"
- the "Horizontal Network".

The first two functions constitute the "Vertical Network". The "Horizontal Network" is that part of the transmission system, which is used to transmit electricity between

countries and within the country. It contains the transmission system elements that are influenced significantly by cross-border exchanges.

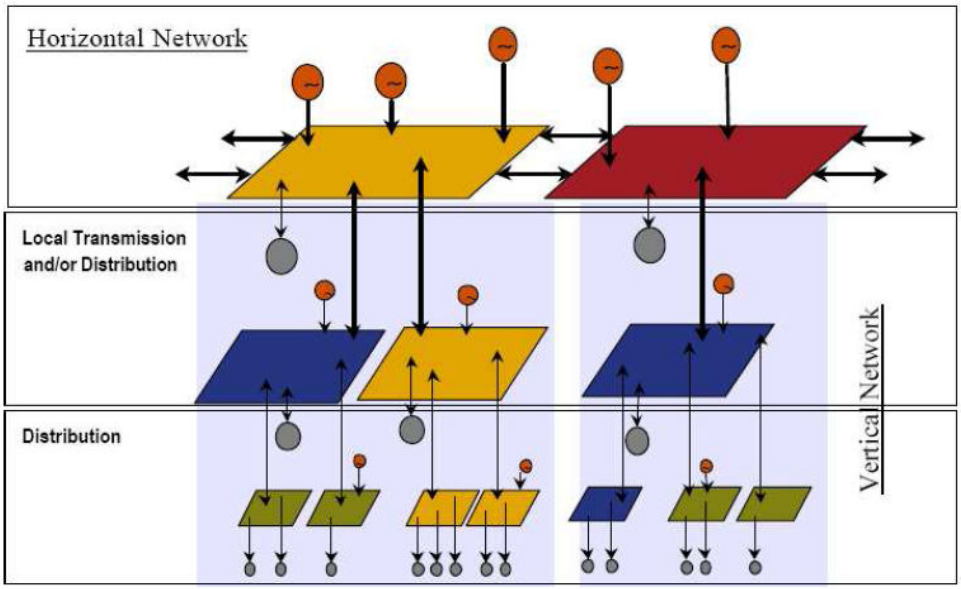

Figure 3-3. Potential Regional Electricity Markets within the EU

ETSO 2005 CBT mechanism presumes that a uniform model and criteria for the identification of the horizontal network of each country is applied. To ensure coherency within Europe, transits taken into account in the determination of horizontal networks must be standardized in terms of magnitude and in terms of pattern (by pattern, we mean the way a transit of given magnitude enters and exits through the different tie-lines of the country/TSO). Therefore, a standardized transit magnitude of 100 MW is used. Then standardized transit patterns must reflect the diversity of possible transits, with various influences on the transmission grid. This is why all possible "one-to-one" transit patterns are considered, i.e. transit patterns with an entering flow in one tie line (100 MW) and an exiting flow in another tie-line (100 MW), and zero flows in all other tie lines. For a country/TSO with N tie-lines, there are N(N-1) such "one-to-one" transit patterns. It can easily be shown that any real transit can be decomposed as the superposition of several one-to-one transits. Therefore, using one-to-one transits will yield very relevant horizontal networks.

In order to decide whether a given grid element must be included in the horizontal network of a country/TSO or not, the method has to identify which elements bear a flow - caused by applying the standard transit between two tie lines - that is greater or equal to 1 MW. Elements with transit flows that are lower than the threshold value are removed. The calculations are undertaken country by country, TSO by TSO and CBT party by CBT party respectively. Socialized HVDC links are included in this calculation, but merchant links are excluded.

Previously cited ETSO 2005 proposal regarding the identification of the horizontal network may be condensed into a few short phrases as follows. The proposal is that cost sharing should be applied only to those facilities in a particular TSO network that would be needed to support 100 MW of "one-to-one" transit flows, i.e., the simultaneous receipt of 100 MW and delivery of 100 MW at two different border points. This is a "technical

auditable approach" which can be initially implemented by "comparing an empty network with superimposed transits" and later improved through the collection and analysis of hourly flow data for the UCTE area. The facilities needed to support the 100 MW transit flows are defined as the horizontal network.

3.6.2. The share of transits or cost claim of each country: transit key

The share of transits in the horizontal network is defined by using the transit key. This approach gives a result that is a share of the overall amount of the infrastructure costs identified by the Allocation of Transit Flow (ATF) approach. It can be combined with the harmonized definition of horizontal network, thus applying an established method to define horizontal network more transparently. The transit is defined as the minimum of import and export flows measured hour by hour at the interconnection lines between countries. The transit key is then calculated by dividing the transit by the sum of transit and the load of the country. It is not related to peak capacity but to the average use of the network. In fact, the transit key is a source of great confusion and the main reason of its adoption is its simplicity.

3.6.3. The costs of the horizontal network

The costs of the horizontal network are based, for reasons of simplification and non-discrimination between national users and transits, on regulated costs by voltage level, km, MVA per TSO. In other words, the costs of the identified horizontal network shall be calculated on the basis of the methodology generally applied by the regulatory authority of the Member State in question (i.e. "regulated costs"). As regards losses, preliminary results using the ATF (Allocation of Transit Flow) model and a limited data set from 2002 showed that countries present different profiles in terms of losses with and without transit. These profiles are of such varying nature for some networks that the number of scenarios may appear insufficient. However, these results already show that a mechanism should be put in place so that countries that benefit from reduced losses due to transits compensate countries that incur increased losses. This could lead to specific charges and/or revenues for the concerned TSOs. ETSO has therefore included within the cost-claim for the CBT mechanism the compensation for losses induced by transits.

3.6.4. Collection of revenues needed to implement inter-TSO compensation (Financing of the ETSO compensation fund) and settlement

The amount of the ETSO compensation fund is the result of technically justifiable and transparent criterion. In the year 2005 it was set at around 370 M€. The ETSO 2005 compensation fund has been divided into two parts:

- **The first part that takes into account the contribution from the perimeter countries.** This is raised from an explicit injection fee of 1€/MWh on the declared exports from exporters/traders of these countries to the area of the signatories of the new 2005 CBT mechanism. The perimeter countries are: UK, Morocco, Croatia, Albania, Former Yugoslavian Republic of Macedonia, Bulgaria, Romania, Russian Federation, Ukraine, Byelorussia and Serbia and Montenegro.

The perimeter countries are entitled to charge a fee for declared exports coming from the continental ETSO area[17].

- **The second (main) part called "net flow" part of the fund.** "Net Flow" is defined as the country hourly net flow in export or import directions. The charge for net flow is the same irrespective of whether it is in the export or import direction. It is raised from the contribution resulting from the national tariffs included in the "L" and/or the "G" component. The decision is left to subsidiarity and therefore to the decision of the individual TSO and its Regulating Authorities.

The flows from all DC links, including merchant links, are included in the net flow calculations. The concept of "edge countries" has been kept within ETSO in respect of the CBT Agreement 2004 to treat the funding depending on the Net Flows for those Parties that border with at least one CBT and at least one perimeter country. Previously cited ETSO 2005 proposal regarding the financing of the ETSO compensation fund may be condensed into a short phrase as follows. As for 2004, and differently from 2002 (1 €/MWh) and 2003 (0.5 €/MWh), this system has no fee on declared exports. It maintains the injection fee of 1€/MWh from perimeter countries and its funding is solely based on national socialized contributions on physical net flows, in import and export direction.

Settlement is required because each part of the contribution is estimated ex-ante, based on the historical data, while the actual contributions paid to the fund are based on the real data from 2005. As the effective income at the end of 2005 may be different from the expected ETSO fund, the settlement of differences will be reported to the following year.

3.7. Croatian laws in energy (electricity) sector

Reforms of energy sector in Croatia have started in the year 2000. The first major step in that direction was promulgation of the so-called "energy law package" comprising five most important laws:

- Energy Law (Official Gazette No. 68/01 of 27 July 2001),
- Law on Gas Market (Official Gazette No. 68/01 of 27 July 2001),
- Law on Electricity Market (Official Gazette No. 68/01 of 27 July 2001),
- Law on Oil and Oil Derivatives Market (Official Gazette No. 68/01 of 27 July 2001),
- Law on regulation of energy activities (Official Gazette No. 68/01 of 27 July 2001 and No. 109/01 of 11 December 2001).

[17] TSOs of South-East Europe (SEE), under the umbrella of ETSO, adopted by consensus an Inter-TSO compensation mechanism for transit for 2005 following the principles of 2005 ETSO mechanism applied in the European Union. Preliminary approval of the main details of this agreement was given by the Regulators, Ministries and the European Commission during the last Athens Forum at the end of October 2004. This mechanism, the second applied in this European region, is operated from the 1st of January 2005 by the TSOs of Albania, Bosnia-Herzegovina, Bulgaria, Macedonia, Montenegro, Romania and Serbia. This mechanism has removed all existing border and transit fees among the signatories while an injection fee of 1€/MWh is applied for perimeter countries. The Inter-TSO compensation fund for induced transits in neighbouring networks will be financed through the national grid tariff of the participating countries sharing the cost among all network users.

The laws were in compliance with EU Directive 96/92/EC. On the basis of these laws the Croatian Parliament passed Law on privatization of INA and Law on privatization of HEP (Official Gazette no. 32/02 of 28 March 2002). Also on the basis of same laws around forty by-laws should have been passed (e.g. Market Rules, Grid Code, General Conditions of Supply, etc.).

Following changes of "EU Directive concerning common rules for the internal market for electricity", the Croatian Parliament passed, in December 2004, new "energy law package" (hereinafter ***energy laws***), which consists of the following:

- Law on Amendments to the Energy Law (Official Gazette no. 177/04 of 15 December 2004),
- Law on Electricity Market (Official Gazette no. 177/04 of 15 December 2004),
- Law on Regulation of Energy Activities (Official Gazette no. 177/04 of 15 December 2004).

These new documents were drafted in accordance with current EU Directive 2003/54/EC. Requirements regarding by-laws are mostly the same. Herein we shall concentrate on laws related to electricity and describe their main provisions.

Energy laws introduce market relationships between entities in energy sector, define transparent relationship between energy entities and customers, and make step-by-step liberalization of the sector possible. They also set legal framework for further restructuring of the sector. Contrary to the former monopoly environment, energy laws make a distinction between regulated and market-based activities. Regulated activities are transmission and distribution of electrical energy (grid infrastructure and services), power system operation, as well as organization of electricity market. Besides, until full market opening, electricity supply could be a regulated activity (public service supply) or a market-based activity. Public service supply is allowed only for supply of tariff customers, while supply of eligible customers is free and negotiable on competitive market. Laws prescribe that energy entity holding an appropriate license is allowed to participate in electricity market competition. The biggest difference between former and current energy laws is the change from model of independent system and market operator (ISMO) to the model of transmission system operator (TSO) and independent market operator.

3.7.1. Energy Law and its amendments

This law regulates the measures for secure and reliable supply of energy and its efficient generation and use; acts which govern and on the basis of which energy policy and energy development planning is implemented; carrying out of energy activities on the market and as public services; basic issues relevant to the carrying out of energy activities with due regard to environmental protection measures. The basic act that determines the energy policy and provides plan for energy development is the Energy Development Strategy that is prepared for a period of ten years. Based on this Strategy, the Government of the Republic of Croatia (hereinafter ***the Croatian Government***) passes the Energy Development Strategy Implementation Programme prepared for the period of at least three years. Energy policy and planning of energy development on state and local levels enable entrepreneurship of energy undertakings. In order to promote the use of renewable energy sources, improvements in energy efficiency and environmental protection measures, the law prescribes determination and implementation of national

energy programmes on the basis of the Energy Development Strategy and its implementation program (in that respect a special Fund shall be established). The most important provisions of the Energy Law are:

- definition of public services in the energy sector;
- energy undertakings (legal or physical persons) can carry out an energy activity only on the basis of an appropriate license[18] issued by Croatian Energy Regulatory Agency – HERA (previously Croatian Energy Regulatory Council - VRED was in charge of this);
- setting the basic principles of tariff system, i.e. elements of energy (electricity) price, as well as general conditions of energy supply;
- obligation of formation and renewal of operational energy reserves - special measures are possible in case of emergency situations;
- definition of stranded costs and taking care of them - recovery out of energy price or compensation pursuant to a special law;
- promotion of incentives for environmental protection measures, use of renewable energy sources and cogenerations (establishment of an agency for energy efficiency and renewable sources is foreseen);
- prescription of fees and tariff system for renewables and cogenerations as well as for market operator;
- prescription of basic principles of relevant methodologies for tariff system and for determining the fee for connection to the network and for increasing the connected load of existing producers and customers;
- inclusion of measures for customer protection,
- providing customers with relevant information about trends and characteristics of energy use and instructing them toward efficient use of energy;
- prescribing construction of energy plants and facilities and its compliance with grants, permits and inspections;
- definition of "force majeure" in the framework of carrying out energy activities.

3.7.2. Law on Electricity Market

This Law regulates the following activities of the energy sector: electricity generation, transmission, distribution, supply and organization of the electricity market. It distinguishes market from regulated activities.

Market activities are:

- electricity generation for eligible customers,
- electricity supply of eligible customers,

[18] However, there are several exceptions. The license is not required for carrying out the following energy activities: 1) generation of electricity for one's own use or electricity production in facilities not exceeding 1 MW; 2) production of biofuel for one's own use or if annual energy production does not exceed 1 TJ; 3) retail of oil derivatives; 4) storing oil and oil derivatives for one's own use; 5) production of heat energy which is produced only for one's own use or in generating facilities not exceeding 0.5 MW.

- trading, mediation and representation on the energy market,

and shall be performed pursuant to the rules regulating market relations, freely negotiating the quantity and price of delivered electricity by concluding short-term or long-term contracts or directly on the organized market.

Regulated activities are:

- electricity generation for tariff customers,
- electricity transmission,
- electricity distribution,
- electricity market organization,
- electricity supply of tariff customers,

and shall be performed as public services.

The Law defines tariff and eligible customers. Eligible customers are all customers with annual consumption above 20 GWh, as well as all customers directly connected to the transmission system. Dynamics of further electricity market opening is set as follows:

- July 1, 2006 for customers with consumption exceeding 9 GWh,
- July 1, 2007 for entrepreneurs,
- July 1, 2008 for all customers.

In special cases (e.g. for eligible customer whose supplier ceases to operate) the company performing the public service obligation, pursuant to the tariff system for electricity supply which does not include eligible customers, shall be the supplier of last resort.

Regarding generation of electricity the Law prescribes conditions for carrying out this activity and possibility for granting the status of eligible producer. Eligible producers may be entitled for incentive price based on the tariff system for electricity generation from renewable energy sources and cogeneration. Concerning construction of new generation facilities there are two basic possibilities: the approval procedure for the construction of generation facilities (energy undertaking makes a decision on the construction at its own discretion) and a public tendering procedure in the interest of security of supply, environmental protection and/or promotion of energy efficiency. In the latter case, for the construction of generation facilities of up to 50 MW of capacity HERA issues a tender and chooses the best bidder, whereas for the construction of generation facilities exceeding 50 MW of capacity the Croatian Government issues a tender and chooses the best bidder upon HERA's proposal.

Concerning electricity transmission and distribution, two companies shall be established: transmission system operator (TSO) and distribution system operator (DSO). In order to achieve their independence, the functional, accounting and legal unbundling is required. The ownership of the transmission assets and distribution assets need not be separated from the vertically integrated company. TSO coordinates electricity generation, transmission and distribution as well as the operation with neighbouring TSOs in the interest of security of supply. It provides information on future electricity demand with the consent of market operator, as well as other information required by the regulatory body and/or market participants. TSO is not allowed to trade electricity. In that respect

electricity procurement for the purpose of balancing, covering the system losses and providing system services is not considered as trading. TSO/DSO is responsible for operation and maintenance, development and construction of the transmission/distribution system (development plan prepared for the period of three years), as well as for partial production of reactive energy. TSO/DSO has to ensure regulated third party access to its network, and take all energy from eligible producers. Data on possibilities for the use of transmission or distribution system shall be public. Grid Code is basic technical document and by-law which regulates system operation and method of transmission and distribution system management.

Electricity supply is independent of electricity transmission and distribution, and refers to purchase of electricity and its sale to customers. Each supplier shall take a minimum share of electricity produced from renewable energy sources and cogeneration, which is prescribed by the Croatian Government. Each supplier has the obligation to inform its customers, at least once a year, on the share of each individual energy source in the mix used to meet customer needs and on environmental impact of electricity generation from all fuels for the entire electricity generation that the supplier used in the preceding year. All households and small customers[19] may exercise their right to the supply of electricity of certain quality as a public service. Association of small and medium-sized[20] customers is allowed for the purpose of joint representation before the supplier. Supplier of tariff customers, generally, enters into two contracts with tariff electricity customers: a supply contract and a contract on the use of transmission and/or distribution network. On the other hand, supplier of tariff customers enters into a contract on the use of transmission and/or distribution network with TSO or DSO on behalf of its customers. An eligible customer and a supplier enter into an electricity supply contract and freely negotiate the electricity quantity and price. Use of transmission and/or distribution network is contracted with the TSO or DSO including the charges prescribed by the Energy Law.

Law on Electricity Market prescribes establishment of independent market operator. Tasks of market operator are:

- passing and publishing Rules of the electricity market operation with prior opinion of TSO and DSO and with the consent of HERA;
- giving consent to balancing energy rules proposed by TSO;
- analyzing market operation and proposing measures for its improvement;
- recording all contract obligations among energy undertakings active in the energy market;
- calculation of deviations for balancing energy settlement;
- harmonization of market plans;
- keeping records of eligible customers on the market until full electricity market opening;
- keeping records of suppliers;
- keeping a registry of eligible producers;

[19] Small customer is any physical or legal person purchasing electricity to meet its own needs, with less than 50 employees and annual turnover or balance not exceeding HRK 70 million.

[20] Medium-sized customer is any physical or legal person purchasing electricity to meet its own needs, a customer with 50 – 250 employees and annual turnover or balance exceeding HRK 70 million.

- entering into contracts with all suppliers to comply with the decree on the minimum share of electricity produced from renewable energy sources and cogeneration;
- collecting funds from the charge for incentivizing electricity production from renewable energy sources and cogeneration (charge is paid by each customer and collected via their suppliers);
- entering into contracts with eligible producers entitled to incentive price;
- settlement and allocation of funds from the charge for incentivizing electricity production from renewable energy sources and cogeneration onto producers of electricity from renewable energy sources and cogeneration based on the contracts entered into.

3.7.3. Law on Regulation of Energy Activities

This Law governs the establishment and implementation of the energy activities regulation system, the establishment of the energy regulatory authority and other matters of importance for energy activities regulation. Regulation of energy activities shall be conducted with respect to regulated energy activities and with respect to market energy activities.

The basic goals of the energy activities regulation are:

- to ensure objectivity, transparency and non-discrimination of energy activities,
- to look after the implementation of regulated third party access to the network,
- to set the methodology for determination of tariff elements of tariff systems,
- to establish an efficient energy market and market competition,
- to protect energy customers and energy undertakings.

Regulation of energy activities shall promote efficient and rational use of energy, entrepreneurship and investment in the energy sector and environmental protection. The Act governs establishment of Croatian Energy Regulatory Agency - HERA (hereinafter ***the Agency***), which replaces Croatian Energy Regulatory Council (VRED) and becomes its legal successor. The founder of the Agency is Republic of Croatia and the founding rights shall be exercised by the Croatian Government. The Agency is responsible for its work to the Croatian Parliament.

The Agency is an autonomous, independent, non-profit based public institution composed of professional personnel and a Steering Council which runs the Agency. The Steering Council consists of five members, one of them being president of the Steering Council and one is vice president. President, vice president and other members of the Steering Council are nominated by the Croatian Government and appointed for five years term by the Croatian Parliament, with the possibility of one reappointment. The president of the Steering Council represents the Agency, takes all actions required by law on behalf and for the Agency, and is responsible for the legal compliance of the Agency's work. The Steering Council appoints the manager of the Agency, based on open competition for the position, for a period of four years with the possibility of reappointment. The manager of the Agency organizes and leads the professional work of the Agency and performs other

work as specified in the Charter of the Agency. The manager is accountable for its work to the Steering Council of the Agency. The Agency is financed by fee for regulation of energy activities out of electricity price. The Croatian Government decides on the amount of fee at the proposal of the Steering Council which has obtained prior opinion of the Ministry of Economy, Labour and Entrepreneurship (hereinafter ***the Ministry***).

The scope of the Agency's core activities can be summarized as follows:

- issuing and revoking of licenses for carrying out energy activities,
- granting the status of eligible producer,
- setting out the methodology for the determination of tariff elements of tariff systems, as well as other methodologies specified by this Law,
- giving opinions to the Ministry and the Croatian Government on relevant issues as specified by this Law,
- passing energy sector regulations for which the Agency is in authority under this Law, and other relevant laws, as well as giving opinion or consent regarding rules and provisions related to energy sector,
- taking care of tendering for construction of generating facilities,
- giving approval for construction of direct line,
- approving development and network construction plans,
- participating in the energy policy design,
- supervision over application of all tariff systems and prescribed fees, as well as supervision over energy undertakings and the quality of services provided by them,
- collecting and processing of data related to the activities of energy undertakings,
- regarding regulation of energy activities which are performed as public services, application of measures for protection of basic consumers' rights in accordance with special laws,
- resolving of disputes related to the carrying out of regulated activities.

Once a year the Agency submits a report on its work to the Croatian Parliament, in particular:

- observations that are of importance to the development of the energy market and public services in the energy sector,
- analysis of the energy sector,
- budget performance of the Agency for the previous year.

3.8. Energy Community Treaty

The Energy Community Treaty that was signed in Athens on 25 October 2005 represents the achievement of the largest internal market for electricity and gas in the world, with effectively 34 participating parties: the 25 European Union Member States and Croatia, Bosnia and Herzegovina, Serbia, Montenegro, Albania, the Former Yugoslav Republic of

Macedonia, Romania, Bulgaria, and UNMIK Kosovo. Negotiations with Turkey are ongoing. Moldova, Ukraine and Norway have applied to join, but for the moment are observers. The signing of the treaty is the conclusion of the Athens process which started in 2002 when the European Commission brought forward proposals for the creation of a regional electricity market in South East Europe.

Why is the Commission spearheading this process and this treaty?

Firstly, improving the balance between energy supply and demand is crucial to improve and sustain economic development in South East Europe. This requires a strong legal commitment by the countries of the region towards market oriented reforms, regional integration and sustainable development, and investment security. This will offer significant advantages both in terms of improved utilisation of existing supply and production capacities, but also in fostering more cooperation and integration in the region, which would result in economic growth, stability and investment.

Secondly, the security of supply of the European Union is based on diversifying supply of gas and electricity and in being politically able to counter threats to energy disruption in the European Union. By connecting this strategic area with the internal energy market, we assist in assuring both the European Union's security of supply and that of the region.

Thirdly, the destruction of the energy infrastructure in the region during the wars of the 1990s and the economic fall-out following the break up of the East-West divide have had tremendous and bad effects on the security of private citizens in this region. Mortality rates have increased, woods have been deforested and established patterns of trade disrupted, impoverishing the local population. The citizens of this part of Europe deserve a higher standard of energy infrastructure.

Figure 3-4. Countries signatories to the Energy Community Treaty

The Energy Community Treaty was intentionally modelled on the European Coal and Steel Community that is the basis of the European Union. The Treaty seeks to allow the states of post-war South East Europe to agree on one area of policy and then jointly develop a shared outlook. The Energy Community Treaty is the key element of the EU strategy in South East Europe and an effective pre-accession tool as it aims to extend the benefits of the Internal Energy market before the states of the region may become members of the European Union. Likewise, it does not demand of commitments to do things in the future, but of each of the states to do things now.

The European Union is in the process of rapidly completing the internal electricity and gas markets. There are solid arguments for extending the internal electricity and gas markets outside the borders of the European Union, but the creation of a level playing field and equivalent environmental and safety standards is a central element for a wider European electricity and gas market to function effectively. The process of inclusion of such countries goes considerably beyond simple questions of the open trade between the European Union and its neighbours under more general international trade obligations. It includes the active creation of a real integrated market, free of any barriers. Practically, in South East Europe that means creating a local regional market and designing it so that it will seamlessly fit into the general framework of the European Union's Internal Energy Market.

That is why the Energy Community Treaty has three operational parts:

- Firstly, the treaty will extend the application of the energy, environmental, renewables, competition and other parts of the *acquis communautaire* (legislation and rules decided at EU level). This will create a level playing field, though there will have to be credible, effective and policed transition dates.
- Secondly, the treaty will create regional mechanisms that extend into the European Union to allow for deeper integration of local energy markets. This will, for example, mean enabling regulation allowing for accelerated infrastructure development, in particular for gas pipelines (especially new connections to the Caspian Sea and the Middle East).
- Given that the idea of a common energy market is central to the Energy Community, there is an agreement to work toward common policies for external trade, mutual assistance and the removal of internal energy market barriers.

The Athens Process

The creation of the Energy Community Treaty is the outcome of the so-called "Athens Process" for regional energy co-operation. This process was launched by the European Commission with the support of the Stability Pact in 2002. Thanks to the dedication of all the parties involved it made rapid progress including the signing of a Memorandum of Understanding on Electricity in November 2002 in Athens, and the expansion of this cooperation to the gas sector through a second Memorandum of Understanding in December 2003. Under these, the SEE countries committed themselves to introducing common rules based on EU legislation in these two sectors. The process received a significant boost through the physical reconnection of the SEE grids to the UCTE network in October 2004.

The Stabilization and Association Process (SAP) for the Western Balkans (Albania, Bosnia-Herzegovina, Croatia, Republic of Macedonia and Serbia & Montenegro) was set up by the EU in 2000 as a long-term commitment to the region both in terms of political effort and financial and human resources. It is based on the gradual implementation of a free trade area and reforms designed to achieve the adoption of EU standards with the aim of moving closer to the Union. In order to speed up the energy market liberalization in the region, in 2002 the European Commission put forward a strategy outlining the principles and the institutional necessities on which the development of the regional electricity market should be based. A communication on the Western Balkans and European Integration adopted by the Commission on 21 May 2003 proposes pre-accession type of relations with the region. A new European Integration Partnership would be created under this proposal as an instrument for monitoring the progress of the reform process in the Balkans countries.

The Athens Process and the Energy Community Treaty provide that the states will:

- implement electricity and gas tariff reform plans;
- implement all necessary technical standards, such as grid codes, accounting systems and information exchange for the operation of the grid;
- implement effective third party access to infrastructure;
- create National Regulatory Authorities and transmission system operators;
- develop local solutions to pressing problems of regulation, energy poverty and social equity; and
- implement the gas and electricity directives.

To guide this process, an appropriate structure has been put in place, known as the "Athens Process" including the Athens Energy Regulation Forum (the Athens Forum), a regular meeting of stakeholders to the process. The Athens Process or Energy Community Treaty involves the adoption by the SEE countries of the *acquis communautaire* on energy, environment, competition and renewables involving, among others, opening of access for cross-border trades in electricity and gas, setting up in each country an independent energy regulator, unbundling of generation, transmission and distribution (at least in terms of management), which comply with regulations concerning large combustion plants, environmental impact assessment and sulphur content.

The South East Europe Energy Regulatory Process was launched by the signature of the Memorandum of Understanding on the Regional Electricity Market in South East Europe (REMSEE) and its Integration into the European Union Internal Electricity Market (the Athens Memorandum of 15 November 2002). The second Athens Memorandum, signed on 8 December 2003, recapitulates the first but updates it to include the new EU legislation and includes gas. It maintains all the commitments of the first memorandum, with the exception of market opening, includes environmental commitments, reciprocity provisions, asks the countries to implement security of supply strategies and asks the countries to agree on the dates for market opening and environmental legislation. It is stronger than the EU ***acquis*** in that it substantially goes beyond the ***acquis*** in pooling sovereignty in this strategic sector. It was agreed by Croatia, Bosnia and Herzegovina, Federal Republic of Yugoslavia, Former Yugoslav Republic of Macedonia, Romania, Bulgaria, Turkey, Albania (Kosovo joined pursuant to UN

Resolution 1244): in addition, Moldova, Hungary and Slovenia were observers. Greece, Italy and Austria are political participants to the process. Negotiations on legally binding multilateral treaty on the Energy Community started in October 2004[21].

The major commitments are:

- to create a regionally integrated electricity market and to integrate that market into the wider EU market;
- to establish state level national energy authorities, regulators and transmission system operator;
- embryonic regional level dispute resolution mechanisms;
- to open the markets in line with EU commitments but with a suitable transition period (all non-domestic markets are projected to be open by 2005)
- unbundling of integrated utilities;
- authorization procedures for new infrastructure that are transparent;
- an anti-corruption programme;
- to implement grid codes and other technical and commercial codes that are necessary for the functioning of the market;
- to implement regulated third party access, tariff systems that encourage trade, and technical codes necessary for the operation of a trade based regional system.

Members are also required to implement national legislation in accordance with Directives 2003/54/EC (electricity), 2003/55/EC (gas), 85/337/EEC (environmental impact assessment) 1999/32/EC (reduction of sulphur content of fuels) and 2001/80/EC (Large Combustion Plants). Legislation is required to be adopted by 1 July 2005 though the timetables for implementation may be later than those applying to EU Members.

The 4th Athens Energy Forum on 3-4 June 2004 approved the proposed CBT mechanism to start on 1 July 2004 and supported SETSO proposals on CBT and congestion management. In addition, the Forum adopted the transition management objectives and schedule on Standard Market Design put forward by CEER. The European Commission tabled for consultation a Consultative Note as an indicative strategy for the region to be finalized later in the year 2005. Participants were also informed about the Tirana Declaration, which creates an independent advisory Board on electricity and gas – "South East European Regulators Board for Electricity and Gas" to be adopted at the forthcoming Ministerial meeting later in the year 2005.

Objectives of the Treaty establishing the Energy Community:

- create a single stable regulatory and market framework capable of attracting investment,
- enhance security of supply,
- improve the situation regarding environment and environmental protection,
- develop competition on a broader geographic scale and exploit economies of scale.

[21] It was signed on 25 October 2005.

The main activities of the Energy Community are the implementation of the *acquis communautaire*, creation of a single mechanism for the cross-border transmission and/or operation of energy markets, as well as creation of a single energy market according to the EC Directive 2003/54 and EC Directive 2003/55 on internal market in electricity and natural gas, and EC Regulation 1228/2003 on conditions for access to the network for cross border exchanges in electricity. Extensions of the *acquis communautaire* in the case of competition are prohibition of agreement and concerted practices having as their objective the prevention, restriction or distortion of competition; prohibition of abuse of dominant position; prohibition of public aid distorting or threatening to distort competition. Timetable of liberalization:

- 1 January 2008 for all non-household customers
- 1 January 2015 for all customers.

By initiating the draft treaty that created the Energy Community in March of 2005, Croatia took the decisive step of joining the regional electricity market, with the ultimate goal of incorporating Croatia into the European Internal Electricity Market. Coming into compliance with EU Directives, governing internal power markets will require that the current monopoly of the Croatian market, presently held by the national power utility (HEP), gradually switches over to a market model.

The EC Treaty is similar to the European Coal and Steel Community Treaty of 1951, in terms of consolidation of reconciliation and prelude to fuller economic integration. It is a key step on the way to EU integration, particularly for countries that are not yet candidates. It has geopolitical importance: diversification of routes for energy supply to Western Europe. The economic impacts of the EC Treaty are that larger market and predictable regulatory environment will attract investment and financing, level playing field with fair conditions for all groups of market participants, increased reliability and security of systems, beneficial diversification and environmental impact through the development of the market for gas, reduction in operation costs and more competitive prices, enhanced transparency, accountability and market discipline. It will also help in the fight against corruption, as well as enable regional framework for determining critical investments, reduction in overall investment needs thanks to enhanced national and regional strategies, and better integration of economic, energy and social policies.

The key features of the Treaty include the following:

Extension to SEE of the *acquis communautaire* as concerns the markets for network energy (i.e. electricity and gas), including requirements such as the unbundling of generation, transmission and distribution activities, the establishment of independent national energy regulators and the opening of access for cross-border trade in electricity and gas. The *acquis communautaire* would also apply in the areas of environmental protection (e.g. directives on sulphur reduction and large combustion plants), competition and renewable energy.

The Energy Community is expected to take measures establishing a single mechanism for cross-border transmission and/or transportation of network energy. Mechanisms for Operation of Network Energy Markets are:

- single mechanism for the cross-border transmission and/or transportation of network energy,
- security of supply statements by each party,

- provision of energy to citizens as part of public service obligations (e.g. universal provision),
- tariff reform and affordability,
- compatibility of market designs and mutual recognition of licenses,
- measures to foster renewables and energy efficiency,
- safeguard measures.

The creation of a single market will be underpinned by the prohibition of customs duties and quantitative restrictions on the imports or exports of network energy (except on grounds of public policy or public security); a common external energy trade policy could be implemented, e.g. with respect to environmental standards or safe operation of the internal energy market. There will be co-ordination of mutual assistance in the event of serious disturbance or external disruption.

The governance of the Energy Community will involve common institutions: a Ministerial Council, a Permanent High Level Group (PHLG), the already existing Electricity Forum based in Athens and the future Gas Forum to be based in Istanbul, composed of representatives of all interested stakeholders, including industry regulators, industry representative groups and consumers. An important new institution will be the Regional Regulatory Board, which will advise the Ministerial Council and the PHLG on the details of statutory, technical and regulatory rules and issue recommendations on cross-border disputes involving two or more regulators. A Secretariat, to be based in Vienna, will provide administrative support and review the proper implementation by the Parties of their obligations under the Treaty.

To guide this process, the following market development coordination and validation structure have been put in place by the Energy Community Treaty:

- **The Ministerial Council**, which takes place every six months with the participation of the Ministers of Energy of the member countries and the Commissioner for Energy, in order to take the strategic decisions and give directions to the Treaty or to formally adopt or endorse secondary legislation. The Presidency of this Council rotates on a six monthly basis.
- **The Permanent High Level Group**, which is composed of representatives of the Ministers of Energy of the Member States of the Energy Community Treaty and the European Commission. The group is convened, when necessary, on the initiative of either the Commission or the country holding the Presidency at the time, in order to prepare the Ministerial Council and to ensure the follow – up of its decisions. The Commission co-chairs this group along with the President in Office.
- **The Treaty Secretariat –** The Secretariat will have its seat in Vienna and will be the central coordinating body for the Treaty, having an important initiating role in developing the Treaty and in making use of the secondary law provisions of the Treaty. It will also be responsible for coordinating international donors, in validating work and in proposing technical, legal and regulatory developments.
- **The Energy Community Regulatory Board in Athens –** This Board, which will have its base in Athens, will consider issues of regulatory co-operation and

may develop into a regulatory decision-making body and/or a dispute settlement mechanism. The European Commission considers its role as central to the operation of the enlarged market, and thinks that his first supranational regulatory body could develop into a model for other parts of the world.

The Electricity and Gas Forum

The Electricity Forum comprises representatives of the European Commission, governments, regulators and transmission system operators of the countries of South East Europe, the Council of European Energy Regulators (CEER), the European Transmission System Operators (ETSO), the Union for the Co-ordination of Transmission for Electricity (UCTE), representatives of donors, electricity producing companies, and consumers. The Forum is co-chaired by the European Commission and a representative of the president in office. It meets in Athens.

With respect to the Regional Gas Market in South East Europe issues, these will be dealt with under the Gas Forum. It is expected to start work in December 2005. It will create a regional plan for the creation of a gas market. This regional plan will have the following objectives:

- to implement national gas market reform in all signatory countries;
- to implement international best practice in the wholesale gas markets and to facilitate cross-border trade;
- to create regional and national gas markets, in part to reduce the environmental impact of existing thermal plants;
- to secure supplies for the region and the EU through the creation of a seamless integrated market between Vienna and Ankara.

In support of the process, the Commission will be providing impartial secretariat support and will help to build the mechanisms necessary for the smooth operation of the Regional Energy Market Development. In addition, the Commission intends to:

- Undertake a benchmarking exercise annually to verify conformity to the Electricity Directive and its derivative legislation, norms and standards, and will also consult relevant bodies with regard to technical standards;
- The Commission has undertaken an electricity infrastructure prioritization exercise (in cooperation with World Bank) and will do the same in gas. The identification and prioritization of projects will have a regional focus and was conducted by the Commission in conjunction with the Permanent High Level Group and the donors;
- Promote dialogue between donors and recipients, in its role as coordinator of donors (as mandated by the Istanbul Conclusions of the Stability Pact 2001).

Supporting this process are the regional level donors. The Athens Donors are chaired by the European Commission following the Istanbul Conference of the Stability Pact in 2001, and the present members are:

- The European Commission

- The World Bank
- The European Bank for Reconstruction and Development (EBRD)
- The European Investment Bank (EIB)
- USA – The United States Agency for International Development (USAID)
- Canada – The Canadian Agency for International Development (CIDA)
- International Energy Agency (IEA)
- Italy, France, Germany, Switzerland and Greece. The UK is associated through the work of the EBRD.

The Commission co-ordinates its own state and regional initiatives at the multinational and bilateral level. Amongst the European Union Member States, Germany, France, Italy and Greece are actively working with the Commission. The adhering countries and the donor community work together with responsible organizations such as the Council of European Energy Regulators (CEER), the European Transmission System Operators (ETSO), the Union for the Co-ordination of Transmission for Electricity (UCTE), and the Energy Regulators Regional Association (ERRA) to achieve our common objective. The Donors have agreed on a strategy paper on the regional electricity market in South East Europe and its integration into the European Union Internal Electricity Market, on 15 November, 2002. It provides the roadmap for developing the electricity market in South East Europe. The World Bank has announced a special fund for the development of the Energy Community Treaty with an initial value of $ 1 billion, which may be replenished. The World Bank is working on a similar fund for gas.

The World Bank, the United States and the European Commission have cooperated to establish an investment needs assessment in South East Europe. To bring the region up to EU levels of security of supply in electricity, the region will require investments estimated at up to $ 25 billion (rehabilitation, new construction and interconnections). For example, the rehabilitation of existing generation facilities and the building of new, in a reference scenario, will amount to a cost of $ 15.4 billion. This cost is a regional cost; if reconstruction was done on a country-by-country basis, the cost would be about $18 billion. So working at the regional level is cheaper. The EU levels of security of supply imply almost perfect system stability, and the application of EU environmental and technical norms.

The region is relatively undeveloped from a gas perspective. Gas is used extensively in Romania, but in Albania there is none. The region is a potential if small market, especially for Caspian and Middle Eastern gas. Delivered prices on gas from these sources are expected to be competitive. As a result there are various pipeline projects in the region, though all of them expect to connect the EU to the gas, and develop the local market as an add-on. The World Bank is leading efforts on the economics of gas expansion with a study. The Energy Community Treaty is expected to adopt legislation that will make the regulatory framework for the long-distance transmission of gas much easier, and will facilitate the investments of European Union companies in the Caspian and the Middle Eastern region. The aim is to have a substantial proportion of EU gas consumption coming from this region from 2010 onwards.

3.9. Congestion management

Congestion means, according to the Regulation 1228/2003/EC, a situation in which an interconnection linking national transmission networks, cannot accommodate all physical flows resulting from international trade requested by market participants, because of a lack of capacity of the interconnectors, and/or the national transmission systems concerned. Transmission congestion must be managed so that transmission capacity is utilized as efficiently as possible, with minimal social welfare loss. Congestion management must provide incentives for investments in transmission network and generation capacity in the right areas. It is important to differentiate between temporary and structural bottlenecks when selecting methods for congestion management. There is a variety of arrangements for transfer across national borders, and for congestion management in Europe. The most attractive congestion management methods depend on the existence of well-developed, stable electricity markets. Market-based congestion management methods improve the transparency and liquidity of electricity markets.

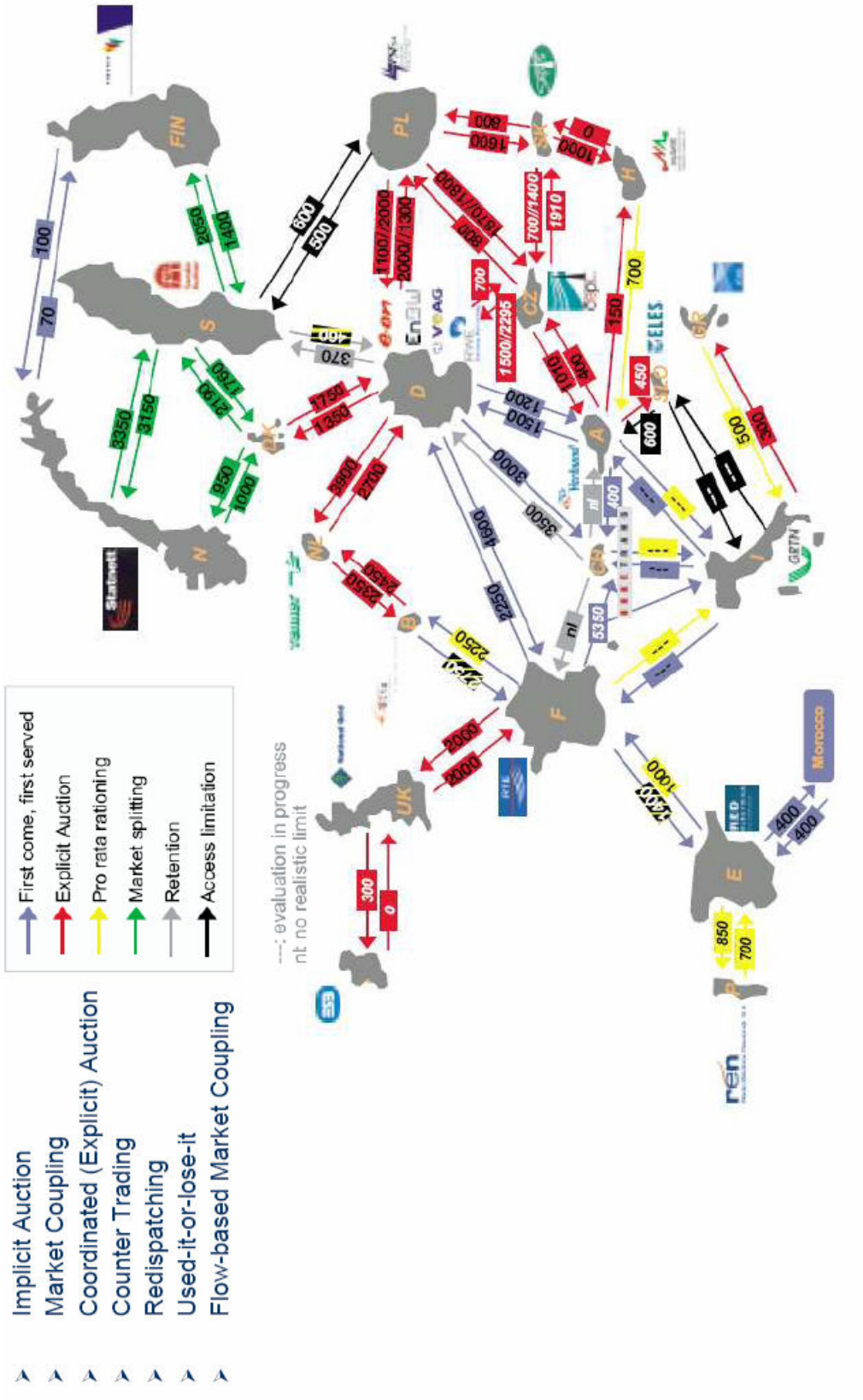

Figure 3-5. Congestion management methods in Europe

Congestion is relatively prevalent on interconnectors because they were not built to facilitate the current large electricity flows between countries. Originally, their main purpose was to allow exchanges between countries for the purpose of system stability. Based on Regulation 1228/2003/EC, the European Commission has drafted congestion management guidelines. The following principles have been agreed on:

- economic efficiency and promotion of competition,
- maximizing the amount of capacity available and the use made of it,
- transparency to network users on a non-discriminatory basis,
- secure network operation,
- largely revenue neutral mechanisms from the system operators' point of view.

Figure 3-6 shows the possibilities of using congestion management methods in different time periods:

- explicit auctions for longer term capacity allocation,
- implicit auctions for shorter term capacity allocation,
- redispatching for "fine tuning" and for secure network operation.

Flow-based capacity determination/allocation is more efficient than fixed bilateral available transmission capacities (ATCs).

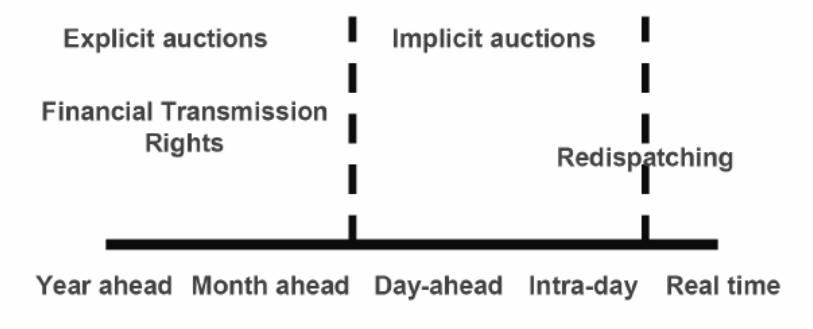

Figure 3-6. Choice of the congestion management method

The discussion on the best congestion management method(s) in the IEM and regions is still developing. The Florence mini-fora were set up by the 11th Florence forum meeting. The mini-fora address congestion management in the European electricity transmission network on a regional basis. The mini-fora aim to provide a plan and detailed timetable for the introduction of at least day-ahead coordinated market-based mechanisms, such as auctions.

Table 3-4. Comparison of congestion management methods

Characteristics and necessary information	CM methods based on NTC				
	First come first serve	Pro rata rationing	Explicit auctions	Implicit auctions	Market splitting
Allocation on single or multiple borders	1	1	1	1	Multiple borders
Transfer capacities constraints	Exchange programs	Exchange programs	Exchange programs	Exchange programs	Exchange programs
Efficient in highly meshed network	Partially	Partially	Partially	Partially	Partially, can be improved in combination with other methods
Market-based?	No	No	Yes	Yes	Yes
Object of trade	capacity	capacity	capacity	Capacity + electricity	Capacity + electricity
Inclusion of bilateral contracts	Yes	Yes	Yes	No	No
Congestion revenue	Transfer capacity price	Transfer capacity price	Transfer capacity price Bid price or Marginal price	Difference: Price in import area – marginal price for exporters	Difference: Price in import area – marginal price in export area
Considering relief caused by transactions with opposite direction	No	No	Possible	Possible	Yes
Pre-condition	-	-	-	PX on the importing side	Regional Power Exchange
Incentives to TSOs for enlarging NTC	No	No	No	No	No
Feasible?	Yes	Yes	Yes	Need strong TSO coordination	Need strong TSO coordination, common PX
Fair and non-discriminatory	Discussable	Yes	Yes	Yes	Yes
Possibilities for gaming	Requests for more capacity than needed	Requests for more capacity than needed	Unreal price bidding	Unreal price bidding	Unreal price bidding
Necessary information provided by market actor	Location, requested capacity[MW], time and duration, time of request	Location, requested capacity[MW], time and duration	Location, requested capacity[MW], time and duration, capacity price	Location, time and duration, amounts [MW]+prices export offers importer bid	Location, time and duration, amounts [MW]+prices bids and offers for each area
Necessary information provided by TSOs	NTC	NTC	NTC and auction result clearing price	NTC and auction result Clearing and imbalance price	NTC and prices

Table 3-4. Comparison of congestion management methods, continued

Characteristics and necessary information	CM methods on physical flow margin		Redispatching Counter-trade
	Coordinated Auctions	Market Coupling	
Allocation on single or multiple borders	Multiple borders	Multiple borders	Multiple borders
Transfer capacities constraints	Physical power flows	Physical power flows	-
Efficient in highly meshed network	Yes	Yes	Partially
Market-based?	Yes	Yes	Discussable
Object of trade	Capacity	Capacity + electricity	-
Inclusion of bilateral contracts	Yes	No	Yes
Congestion revenue	Total congestion charges are shared between TSOs	Total congestion charges are shared between TSOs	Net users charged Market participants charged / Difference between congestion revenue and redispatch cost
Considering relief caused by transactions with opposite direction	Yes	Yes	Yes, this is the basis of the method
Pre-condition	Common Auctioning Office	Power Exchange in each area	-
Incentives to TSOs for enlarging NTC	No	No	Yes
Feasible?	Need strong TSO coordination, common auction	Need strong TSO coordination, PX in each area	Need strong TSO coordination
Fair and non-discriminatory	Yes	Yes	Discussable
Possibilities for gaming	Unreal price bidding	Unreal price bidding	TSO is trader, independency of TSO ?
Necessary information provided by market actor	Location, time and duration, amounts [MW] bid for capacity price	Location, time and duration, amounts [MW]+prices bids and offers for each area	Location, time and duration, amounts [MW], bid price
Necessary information provided by TSOs	Border capacities, PTDF matrix	Border capacities, PTDF matrix	General schedules and ex-ante congestion prices