South East Europe Regional Energy Market Support (SEE REMS) Project

Tariffs Benchmarking

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1. Introduction and Summary

1.1. Introduction

This report represents the results of a joint effort of consultants from IRG as well as ANRE (Romanian Regulatory Authority), Chairman of the Internal Market TF of CEER SEE WG, to obtain, assess and analyze data on the state of electricity transmission tariffs in the SEE region[1]..

Under contract number EPP-I-00-03-00006-00 Order No. 1 between the U.S. Agency for International Development (USAID) and International Resources Group (IRG), five tasks were established for the project. This report covers Task 3: Regional Tariff Harmonization and the current stage of the work is confined to the electric power sector. If time and resources permit, gas transmission tariffs will be covered subsequently.

In order to obtain the data for this report a questionnaire was devised and distributed to the Contracting Parties, Turkey and to the relevant EU Member States.. Bulgaria, Romania, FYROM, Bosnia and Herzegovina, Albania, UNMIK, Serbia and Montenegro responded to the Survey. Turkey, Italy, Greece, Hungary, Slovenia and Austria also responded to the questionnaire and their answers can in some cases be used as some standard of conformance to EU relevant legislation as well as indicating best practices in the power industry. This questionnaire was designed by ANRE and IRG and administered with the initial responses organized by ANRE of Romania. The report is a joint product of ANRE and IRG. Some tariff data were also provided by another USAID contractor, Pierce-Atwood.

The report is organized as follows:
1. Introduction and Summary
2. Description of the Questionnaire
3. Participant to the survey-Specific Responses – Description of Transmission and Distribution Tariffs
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1.2. Executive Summary

As the nations of Southeast Europe prepare to enter the single energy market of the EU, they must conform to certain practices that will promote greater trade in electricity while reducing transactional costs for market participants. This study addresses the nature of transmission

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[1] Croatia is an integral part of the SEE but is not included in this Report as it did not respond to multiple data requests. The Contracting Parties to the Energy Community Treaty, Turkey and EU Member States covered by this report will be hereafter referred to as "participants to the survey".

tariffs for electricity and permits comparisons of both level and structure of these tariffs between and among the SEE participants to the survey and EU Member States.[2]

The current report addresses the first two items in this list. Gas issues will be dealt with subsequently. Tariff issues as they affect cross-border trade in electricity comprise a major element of the EU program for the internal electricity market.

1.2.1 Current EU Initiatives on Transmission Pricing

Encouragement of greater electricity trade has long been identified as a key area of EU interest. The 2003 Regulation[3] on network access specifically states;

> (6) The European Parliament, in its Resolution of 6 July 2000 on the Commission's second report on the state of liberalisation of energy markets, called for conditions for using networks in Member States that do not hamper cross-border trade in electricity and called on the Commission to submit specific proposals geared to overcoming all the existing barriers to intra-Community trade.

> (7) It is important that third countries that form part of the European electricity system comply with the rules contained in this Regulation and the guidelines adopted under this Regulation in order to increase the effective functioning of the internal market.

The proposal clearly recognizes the importance of "network externalities" in spreading the maximum benefits of open access to electricity transmission systems. At the same time, the Regulation recognizes that as the EU's Guidelines on Transmission Tarification (18 July 2005) specifically state: "[these guidelines should] determine appropriate rules leading to a progressive harmonisation of the underlying principles 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, in accordance with the principles set out in Art. 4."

To that end, the EU calls for the following steps to be taken:
1. Harmonize network access charges for generators (the "G" component);
2. Provide locational price signals for generation and transmission;
3. Eliminate distance-based transmission tariffs and charge for entry and exit.

The guidelines also call for specific ranges of "G" tariffs in various parts of the EU. The suggested range for Central and South-eastern Europe is €0-6 per MWh.[4] Further, the guidelines require that "National regulators will report to the Commission by 28 February 2006 on how the TSOs' charging structures will comply in 2006 with the Guidelines. National Regulators shall provide the year 2006 value of the annual national average G to the

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[2] The overall scope of work for this element addresses the following issues:

    a. How can energy tariff methodologies be harmonized and the substantial energy price differentials between participants to the survey narrowed?

    b. What should participants to the survey and donors do to help address the social impacts of energy restructuring, price rationalization, and market liberalization, especially for low income and vulnerable groups?

    c. What is the potential for gas substitution in the heating sector, particularly as it relates to the reduction in the use of electricity space heating, the competition with district heating, and the use of cleaner fuels?

[3] REGULATION (EC) No 1228/2003 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 June 2003 on conditions for access to the network for cross-border exchanges in electricity.

[4] Permissible ranges for the UK and Nordic countries range upwards of €0.7-1.3/MWh.

Commission by the end of July 2007. Afterwards only amendments to the charging structures and G-values shall be submitted to the Commission yearly by the end of July."

A survey of EU members indicates that most of the burden of transmission cost allocation is put onto the consumers of electricity (the "L" component).[5] In one respondent the G component is charged more than 50% of transmission system charges (Romania), while in several, the L (Load) component accounts for 100% of transmission charges (Belgium, Czech Republic, Germany, Netherlands, Slovenia, Portugal, and Spain). Where ancillary services are charged as a separate component, the entire charge is placed on the L tariff component.[6]

The EU survey found that there are significant national differences in transmission charges at EHV (>400 kV), ranging from €3/MWh in Sweden, Norway, Finland to €10-14/MWh in Denmark (East), Poland, Italy and Portugal. TSO charges account for some of this differential, but the range is still more than €8/MWh from lowest (Sweden) to highest (Denmark East).

The other key differential in pricing is the charge for either energy or capacity in the overall transmission charge. Hungary, Romania, Italy and Denmark assign 100% of charges to energy. In Belgium, England and Wales, France, Germany and Greece most of the transmission charges are assigned to capacity ("power" in the EU text).

Other matters of inquiry in the EU survey included the following:
- Seasonal price differentials
- Time of use differentials
- Locational price differentials
- Ancillary services charges
- Stranded cost, isolated grid price equalization and other miscellaneous system charges

These issues are all addressed in the current survey as well. In particular, it is critical to see what impact the "best practices" tariffs of current EU members may have on the criteria listed below as a guide to the desirability of adopting new or different tariff structures.

1.2.2   The Current SEE Transmission Pricing Survey

Using the previous EU effort as a guideline and taking into account the specific conditions of the SEE participants to the survey, a new questionnaire was devised that would provide even more detailed information on the SEE participants. This questionnaire is reproduced in Annex 1.

There were two stages leading to the current state of this activity: (i) formulation of criteria for evaluating the SEE participants to the survey' tariffs; and (ii) compilation of the information into a form that can be shared with the participants to the survey and others. All SEE participants to the survey with the exception of Croatia have responded to the questionnaire or have indicated that they have not yet formulated transmission tariffs that justify a response. Some respondents are just in the initial stages of transmission pricing and have not yet developed information for all of the categories requested in the survey.

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[5]   See ETSO, "Comparison on transmission pricing in Europe", 2004

[6]   Ancillary services (A/S) are included in the total transmission charge discussed in this paper since virtually all systems will charge for the A/S either explicitly through a pricing mechanism for A/S or implicitly through the variable cost element in the transmission tariff.

1.2.2.1 Criteria for Benchmarking Analyses

In order to assess and compare the information on tariffs contained in the responses to our survey, the investigators devised seven criteria that would be used to evaluate the existing tariff information. These criteria are listed directly below:

1. Impact on investment,
2. Impact on trade in electricity,
3. Impacts on low-income consumers.
4. Cost coverage and fiscal soundness,
5. Incentives for efficiency,
6. Ease of regulation,
7. Status of participating countries with regard to benchmarks.

Distribution tariff information is included, along with transmission information, in order to assess whether and to what extent transmission pricing plays a role in the final price of electricity to consumers, and if so, how that is reflected in the prices paid by consumers. In order to gauge the differences, if any, between competitive and regulated markets, the questionnaire also investigated the prices in both types of systems within each participant to the survey, where applicable.[7]

An appropriate or effective transmission tariff is not in itself capable of stimulating investment or trade in electricity. However, as with most regulated pricing issues, the matter is asymmetrical. That is, while an effective pricing structure is necessary, but not sufficient, to stimulate trade and investment, a poorly conceived pricing structure can be sufficient in and of itself, to depress investment and trade.

1.2.2.2 Preliminary Findings of Transmission Benchmarking Survey and Analysis

The survey responses indicated that as a general matter, effective tarification proceeds from the specific to the general. That is, utilities must formulate prices for electricity so that they can collect fees from actual consumers of various types. Thus the retail tariffs are the first to be fully formulated.[8] Even in those participants to the survey that have not yet completed the full construction of a transmission tariff, there are retail tariffs for the relevant customer categories. The process that participating utilities undergo, whether due to EU accession or internal market participation agreements, leads to the gradual financial unbundling and restructuring of the system, with its concomitant need for more sophisticated and articulated component tariffs, including transmission and generation.

With the arrival of transparent accounts for each segment of the electricity business, it is then possible to make progress on the component tariffs. This process may subject some SEE participants to the survey to financial difficulties, since transparency does not permit stranded costs or other charges to be included without justification in an overall electricity charge. Moreover, the pressure of trade and least cost supply from other countries creates pressure to eliminate extraneous costs and charges from both generation and transmission tariffs.

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[7] It may seem odd to question whether the transmission tariffs are actually incorporated into the prices that consumers pay for electricity. However, the continued presence of various subventions and cost-shifting mechanisms brings into question the extent to which even a well-designed tariff is fully reflected in the consumer's price of electricity.

[8] Even where a separate transmission tariff has yet to be formulated, as in Serbia and Montenegro, there is still a fully articulated system of retail electricity prices, which include, to some degree, the cost of transmission and distribution services and infrastructure.

A brief summary of the findings indicates that:

1. Transmission prices for those South East Europe (ECSEE) participants to the survey that have already unbundled electricity pricing ranges from 1.37-5.7 €/MWh. This compares with a range for EU members of 3-14 €/MWh.

2. With regard to trade and investment, the questionnaire responses from both SEE participants to the survey and the EU Members indicate that optimal transmission tariffs, while desirable, are not necessary to stimulate trade and investment. A "good enough" tariff that covers costs and sends the right signals on congestion and location is an excellent starting point.

3. Cost coverage *in full* is a feature of all of the respondents that have successfully restructured and are currently experiencing increased trade and investment in the sector.

4. Many participants to the survey, including some EU members, use some sort of cross-subsidy to protect certain classes of electricity users. The only effective way to reduce this cross-subsidy is to limit the extent of such subventions in the law and hope that stronger economic growth will gradually erode the importance of such payments. Where cross-subsidies are significant relative to the overall tariff revenue, potentially beneficial effects of separate tarification of transmission are lost in the noise of the transfer payments.

5. Many respondents have started to feature more incentive clauses for promoting improved efficiency. These include ancillary service charges, time of use rates for the load component and locational differentials that reflect the relative scarcity of system resources at different times and points on the system. Most participants to the survey have either locational or temporal price differentials and four SEE participants to the survey have ancillary services tariffs to at least some degree.

6. Successful tarification of transmission and distribution does not require data acquisition that is beyond the current capabilities of regulators. At the same time, it is critical that regulators make great efforts to verify the accuracy of the data.

7. The respondents show significant differences in their progress toward tariffs that meet the EU guidelines discussed above. However, it appears that, from the experience of current EU members who have responded, a conforming tariff can be constructed relatively quickly, given the political will.

The table below presents a summary of selected features of SEE participants to the survey transmission tariffs, along with comparisons with four EU members who also responded to the survey.

Participant to the survey	Share of Network Costs (%)		Price Signals (x =>xxx)		Average Value (€ per MWh) *without system services*	Does Transmission invoice Include System Services?
	Generator	Load	Time of Day/Seasonal	Locational		
Albania			x	x	N/A	Y
Bosnia-Herzegovina	0	100	x	x	5,01	N
Bulgaria	0	100	xxx	x	4.76	N
UNMIK			N/A	N/A	N/A	Y
FYROM			x	x	N/A	N
Romania	50.3	49.7	xx	xxx	5.7	Y
Turkey	50	50	x	xxx	3.63	N
Other Respondents						
Austria			x	xx	N/A	N
Greece	30	70	x	xx	4.4	Y
Hungary	0	100	x	x	9.0	Y
Italy	35	65	xx	x	~12	N
Slovenia	0	100	xx	x	4.1	Y
Notes: System services generally include both losses and reactive power, as well as system operation charges. Other A/S are not included. Some participants to the survey have not yet completed their transmission tariffs or have not yet fully differentiated certain cost elements. Italy charges a fixed fee in addition to the G and L charges. Most of the missing results for the SEE participants to the survey will be furnished early in 2006 as UNMIK, Albania, Bosnia-Herzegovina and FYROM implement newly-designed transmission tariff systems. Where A/S are included in the transmission tariff, they are sometimes denoted separately on the invoice, as in Romania. In Greece, the share of costs between "G" and "L" has already changed to 15% and 85% respectively (1st January 2006).						

Table 1: Selected Results of Transmission Pricing Survey: Prices and Incentives

Participant to the survey	Transmission Tariff	Distribution Tariff	Other Fees, Subsidies
Albania	Combination of price and revenue cap	N/A	Losses, capacity reservation
Bosnia-Herzegovina	Cost + rate of return	cost+rate of return	Losses
Bulgaria	Cost + rate of return	Cost + rate of return with revenue cap	Losses
UNMIK	N/A	N/A	Subsidies to public broadcasting
FYROM	Revenue cap structure With performance incentives	Price cap structure with performance incentives	Covers losses in some industries
Romania	Revenue cap structure	Price cap structure	Losses, ancillary services, limited subsidies to those using less than 1000 kWh/yr.
Turkey	Revenue cap structure 47.8% Opex 3.5% Capex 42.5% Stranded Cost 6.1% ROI	Revenue cap structure	Losses, ancillary services, "energy fund"
Other Respondents			
Austria	Cost + rate of return	Cost + rate of return	
Greece	Cost + rate of return	Cost + rate of return -Only for "eligible customers" at MV	Charge in lieu of ancillary services, losses are charged to generators.
Hungary	Cost + rate of return with 4th year review	Cost + rate of return with fixed charge + energy charge	Losses, system (ancillary) services, stranded costs, renewable energy & cogeneration support
Italy	Cost + rate of return	Revenue cap and price cap	Separate ancillary services market, losses are paid by generators
Slovenia	Price cap with capital expenditure adjustments	Price cap with capital expenditure adjustments	Losses

Table 2: Selected Results of Transmission Pricing Survey: Methodology

Trade and Investment

A general presumption that effective transmission and generation pricing is a necessary but not sufficient condition for healthy trade and investment in electricity has some support in the questionnaire responses. The figure below shows the rough correlation between trade and investment and pricing policies in the power sector. The goal of tariff restructuring is to move toward quadrant I, without getting stuck in one of the low investment or low trade quadrants. In looking at current EU members, most of which can be presumed to be in some degree of conformance to the EU guidelines, trade is growing from one year to another and amounts to more than 15% of total supply or production from most countries.
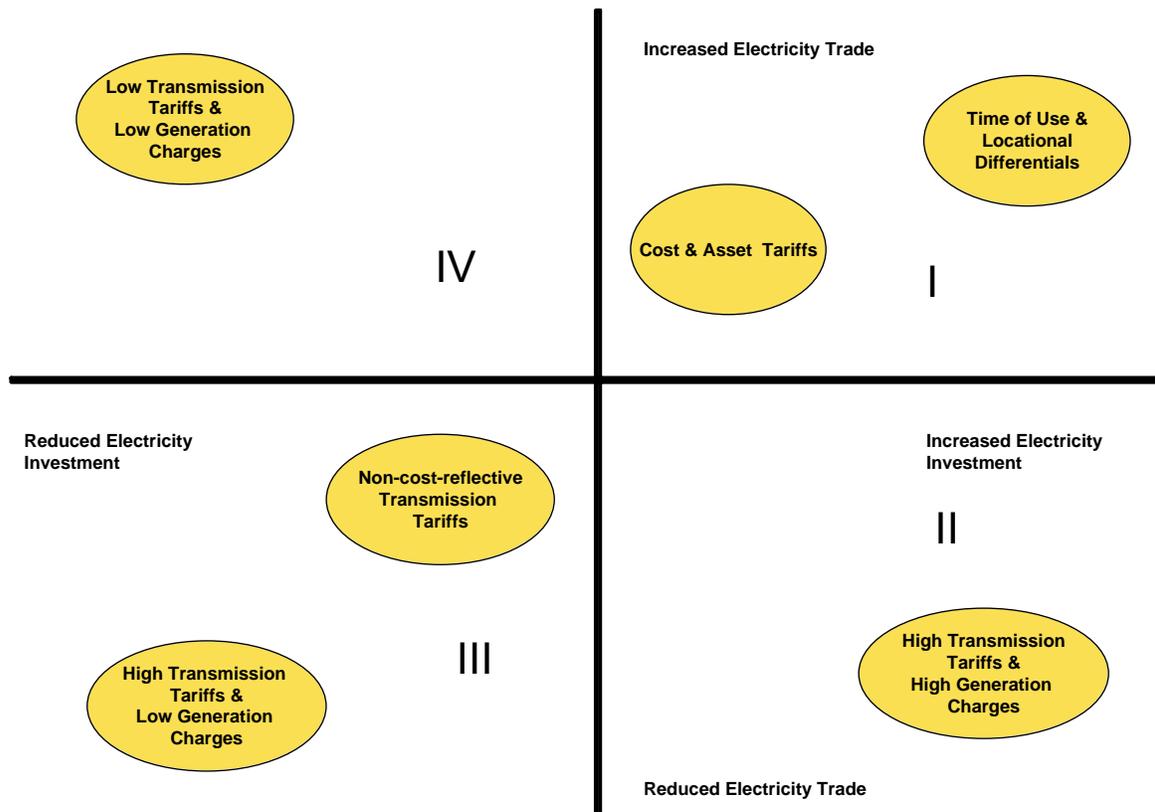
Increased Electricity Trade

Low Transmission
Tariffs &
Low Generation
Charges

Time of Use &
Locational
Differentials

Cost & Asset Tariffs

IV

I

Reduced Electricity
Investment

Increased Electricity
Investment

Non-cost-reflective
Transmission
Tariffs

II

High Transmission
Tariffs &
High Generation
Charges

High Transmission
Tariffs &
Low Generation
Charges

III

Reduced Electricity Trade

Figure 1: Impacts of Pricing Policies on Trade and Investment

In contrast, the SEE nations have less trade in electricity in general. The combination of a "cost & asset" type of transmission tariff that characterizes many EU members with more open investment policies and reduced transactional costs for investors, has served some of the newer EU members well in terms of electricity sector investments. As long as the pricing and costing system is reasonably efficient and truly reflects costs, it does not have to be optimal to be effective.

Growing energy exports in Romania and Bulgaria reflect the quadrant IV phenomenon of low cost supply to foreign customers. This allows the country to continue to use the large installed capacity built before 1990 in the face of reduced domestic demand. SEE participants to the survey without significant surplus capacity, for example Albania, show decreasing exports and sharply rising imports. Quadrant IV works to some extent as long as the participant has significant overcapacity in both transmission and generation and does not need upgrading of its systems in the near future.

Conversely, quadrant II represents a stable equilibrium only for participants to the survey with low industrial demand for electricity or where competition from imported goods, which are made with less expensive electricity elsewhere, can be restricted. This is not the condition typical of an EU member state, so it does not represent a feasible solution for the SEE participants to the survey.

Some of the SEE participants to the survey appear to have found a temporary equilibrium in quadrant III. This quadrant represents low investment and low trade. For those participants

finding themselves in this zone, it is usually a result of low generation charges, with consequent low incentives for generation investment and transmission charges that do not facilitate optimal trade. Some of the former Yugoslav republics currently occupy this quadrant.

Central and Eastern European nations that are already members of the EU generally show increases in both imports and exports of electricity over the period 1999-2003. This means that prices in their systems reflect the true opportunity costs of generation and transmission to a greater degree than was the case in the past, and that companies have the freedom to act on this information in terms both of investing in new capacity and in purchasing or selling electricity. For example, Hungary generated about 10% less electricity in 2003 than it did in 1999, reflecting rationalization of capacity. However, the country's exports have risen from 9.5% of total generation to 43.8%. At the same time, imports have risen from 6.6% to 22% of total generation. This means that the country is able to use the lowest cost electricity resources on offer at a given time from their own or other systems, and that when their own electricity is the least cost in the region, it is exported to other systems. A similar pattern has been repeated for the Czech Republic, Poland, and the Baltic nations of Latvia, Lithuania and Estonia

Impacts on Low Income Consumers

Retail tariff structures in Turkey, Greece, Hungary, Romania, Bosnia-Herzegovina and UNMIK each reflect *some* degree of special consideration for low-income consumers (defined as those who use less than a certain specified monthly consumption level). In the case of Turkey, the tariff regulations define certain types of consumers who are eligible to receive discounted tariffs. Greece gives the social tariff only to families with more than 3 children or to farmers.

Others in the list provide electricity for use below a specified level at a lower price. Since smaller consumers are more expensive to serve, this pricing policy constitutes a cross-subsidy in favour of those users. The degree of discount for smaller users ranges from 4.3% in Hungary to about 30% in Romania and UNMIK. Romania limits the subsidized portion of the monthly use to 60 kWh, about enough to run a few lights, a small refrigerator and a radio.

For the remainder of the respondents no special tariffs are used for low income households or for smaller users.

Cost Coverage and Fiscal Soundness

Covering all of the costs of electricity transmission is the first and most important function of a tariff. Moreover, these costs must be passed through to final users of electricity, and not paid through government subsidies for the tariff to send appropriate scarcity and resource use signals to electricity users. A transmission tariff is considered fiscally sound if (i) the transmission system owner does not require direct government subventions to pay operating costs; and (ii) if the costs can be adjusted easily and quickly to cover changes in the business environment. Seven participants to the survey employ a revenue cap for calculation of the transmission and distribution tariff, Albania, Bulgaria, Romania, Turkey, Slovenia[9], and FYROM. In each case the components of the revenue cap formula are reviewed periodically to make sure that they remain appropriate. .

The remainder of the reporting participants to the survey use variants of a "cost plus" approach that bases the transmission and distribution tariff on a combination of fixed and variable costs. The fixed costs in each case are based on either historical investment costs or "mildly adjusted"

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[9] Slovenia's Revenue Cap is only partial, with the remainder of the tariff making use of a price cap with the traditional *RPI-x* formulation.

investment costs. In both Turkey and Romania, distribution operating companies (DOs) set regionally variable distribution tariffs.

In all participants to the survey where an actual transmission and distribution formula has been devised and implemented, the system is capable of covering the current operating and historical fixed costs of the system. However, to provide cost coverage for new transmission system investment, necessary for increased trade volumes in the region, only the revenue cap participants plus Austria and Hungary have formulas that are sufficiently flexible and adjustable that new investment can be transparently and simply accommodated.

Incentives for Efficiency

A tariff can be a boon to efficiency in the transmission and use of electricity or it can be an obstacle. The basic conditions for efficiency are covered by whether the transmission (and distribution) tariffs cover their costs. While cost coverage is a first order condition, it is not always sufficient to ensure that generators and load centres receive the appropriate signals concerning congestion, timing and direction of flows.

For that reason, a number of the respondents augment simple cost coverage with locational and/or temporal price signals. In addition, some have a separate ancillary services charge that covers system services. The following listing shows the extent to which the respondents have integrated specific efficiency inducements into their transmission and distribution tariffs:

Participant to the survey	Locational	Time of Use	Ancillary Services
Albania	No	Yes	Yes
Austria	Yes	No	No
Bosnia-Herzegovina	No	Yes	Yes
Bulgaria	No	No	No
FYROM	No	No	No
Greece	Yes (only for generators)	No	Yes
Hungary	No	No	Yes
Italy	No	Yes	Market
UNMIK	No	Yes	Yes
Romania	Yes	Yes	Yes
Slovenia	No	No	Yes
Turkey	Yes	No	No
Note: virtually all participants to the survey distinguish between day and night for industrial tariffs, and for certain commercial and even residential users. However, this table covers only time and locational differentials in the network tariff, not in the energy commodity charge.			

Table 3: Transmission and Distribution Tariff Variations

As the table above shows, network pricing is not seen universally as a means to improve system performance. For those participants to the survey with cost or price cap tariffs (those with RPI-x annual adjustments) there are further incentives to improve efficiency. Improvements in performance greater than the expected productivity improvement (the "x") are kept by the company and the company can also try to lock in costs to reduce the annual inflation factor as well. Of the SEE participants to the survey, Slovenia, Turkey and FYROM now use this type of transmission tariff adjustment to provide incentives for further efficiency improvements. Revenue caps, which are not much used in the SEE participants, are problematic with regard to

both efficiency improvements and new investments. Recent literature on revenue caps casts doubt on the usefulness of this method of regulation in dynamic systems[10]

Ease of Regulation

The simplest system to administer is a revenue cap system. Formula adjustments are made only every several years. At most times regulation thus consists largely of enforcement and monitoring, using easily reportable or obtainable information. Cost or price cap systems are almost as easy to regulate. The key difficulty in devising a cost cap system is the choice of the appropriate productivity index and the selection of a base period.

On the contrary, the most difficult systems to administer from a regulatory standpoint are the ones featuring significant locational and temporal adjustments. No transmission pricing system in Europe approaches the complexity of the PJM system in the US or the pre-NETA transmission pricing system in the UK. In both of those cases the data requirements are extremely high and require significant investments in data processing, simulation modelling and verification by regulators.[11]

Successful transmission pricing in the participants to the survey consists of using "good-enough" methods so that most of the benefits of incentives and temporal and locational efficiencies can be captured by the pricing systems. Examples of this include the locational pricing model of Romania, the cost-plus pricing system of Hungary and the incentive-based pricing systems of Slovenia, Turkey and FYROM.. The "good enough" systems do not present market participants with all of the incentive benefits of full locational and temporal variations (e.g., the locational marginal pricing systems of New Zealand, PJM {USA}, or the market systems of NordPool or UK). However, where a system has been recently liberalized and is in need of substantial upgrading and capacity expansion, a "good enough" tariff system, which fully accounts for current and expected investment costs, is essential. There is abundant experience on the problems associated with fully liberalized markets in the presence of capacity limitations and imperfect competition. The "good enough" pricing systems of Hungary and Slovenia should be seen as appropriate vehicles to relieve constraints and to set the stage for fully liberalized systems subsequently.

Both of the authors of this report have designed both cost-plus and incentive-based transmission and distribution pricing systems for several nations. They have found that the incentive system is generally easier to implement and administer, as long as there is a reasonable degree of trust between the regulator and the utility, and as long as there is already sufficient capacity in the system to meet the needs of the market. To be successful an incentive-based pricing system must have periodic formula reviews and revision procedures so that changes in investments and operations can be accommodated properly. To initiate such a system, where a fully worked-out transmission pricing system does not now exist, requires a thorough initial review, followed by periodic audits. The initial review can be done with the assistance of external consultants so that the regulator does not need to maintain the very high staffing levels required to conduct full "cost-plus" reviews annually.

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[10] Most of the literature on revenue caps comes from Australia, which has tried to use these to control transmission costs. See the submissions to hearings in front of the Australian National Electricity Code Administrator, http://www.accc.gov.au/content/index.phtml/itemId/3877/fromItemId/3671.

[11] Indeed, so complex is the justly-renowned PJM transmission pricing system that most of the state utility regulators in the member states feel uneasy about their abilities to understand and regulate the transmission tariffs that result from the activities of the PJM control centre and its member utilities. Only the consistently effective results of the PJM operations keep the unease of the regulators at bay.
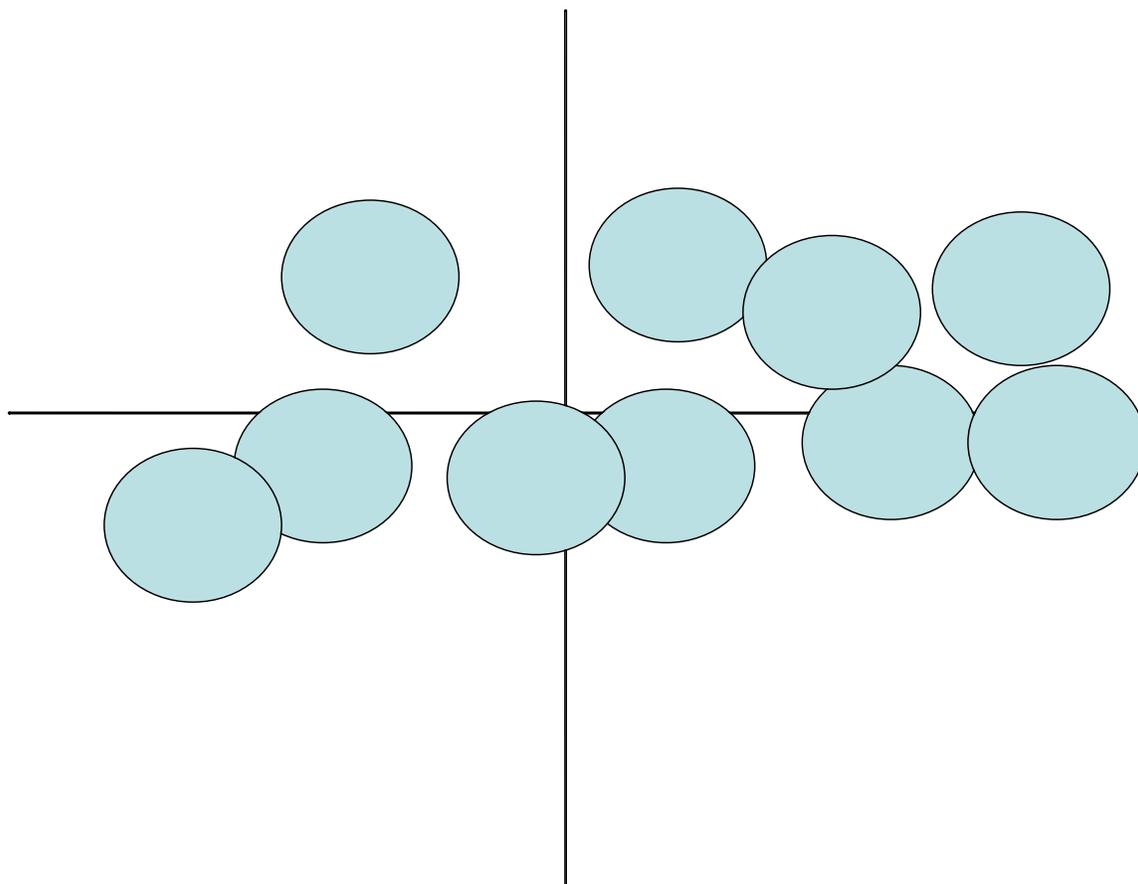
Figure 2: Status of Tariff Working Group Members

Status of SEE Participants to the survey with Regard to Benchmarks

As the previous discussion has indicated, the SEE participants to the survey have achieved varying states of completion of appropriate and effective transmission and distribution tariffs. The figure above shows the relative positions of the SEE participants in terms of efficiency and completeness of the transmission and distribution tariffs.

The UNMIK and FYROM tariffs are still in progress. If the implemented tariffs of Slovenia and Hungary are seen as EU-acceptable end points for the tarification process, then Romania is close to the EU benchmarks in terms of both promotion of efficiency and completeness. On the other hand, the FYROM tariff, though effective, is still somewhat incomplete as regards accounting for generation costs and ancillary services. The UNMIK tariff is still a work in progress, as is the Bosnia-Herzegovina tariff. Of the two the UNMIK tariff structure seems to be more promotional with regard to efficiency, especially in its time of use pricing structure.

Both Slovenia and Hungary show that a tariff can be complete, comprehensible and conducive of efficient behaviour from both generators and load customers without being overly complicated. The two tariff structures are quite different, with Slovenia using incentive-based tariffs and Hungary employing a "cost plus" type of tariff. Of the two, Slovenia's probably promotes efficiency a bit more, but both get the job done.

2. Description of the Questionnaire

The transmission tariff questionnaire consists of seven parts. The full questionnaire is reproduced in Annex 1. The description of the questionnaire follows:

Transmission Tariff

- Existence of a separate transmission tariff
- Description of the tariff – type of tariff, time periods, voltage levels, locational elements, etc.
- Tariff methodology - words and formulae
- Average values – power, energy, generation (G), Load (L)
- Other elements in tariff – losses, system services, TSO

Ancillary Services Tariffs (A/S)

- Existence of A/S tariff
- Description – services covered
- Methodology – example for 40 MW transaction
- Energy and Power charges used for A/S tariffs

Distribution Tariffs

- Existence of a separate distribution tariff
- Description of the tariff – type of tariff, time periods, voltage levels, locational elements, etc.
- Tariff methodology - words and formulae
- Average values – power, energy, generation (G), Load (L)

Regulated Retail Tariffs

- Description of retail tariffs (including social tariffs or other special tariffs if applicable)
- Tariff methodology (who sets the tariffs, how often, what principles are applied, etc.)
- Values for consumers
  - Average annual price – total

Competitive retail tariffs

- Average price on the competitive retail market
- Real market opening share

Generation prices (or costs) as of 1 July 2005

- Hydro power plants
- Coal fired power plants
- Oil fired power plants
- Gas fired power plants
- Nuclear power plants

Other Tariff Considerations

- VAT
- Other taxes applicable to electricity:
- Subsidies (2004)
  - Subsidies to utilities
  - Subsidies to industrial consumers
  - Subsidies to residential consumers
  - Write-offs of various consumer uncollectibles
- Average income per family (preferable July 2000 and July 2005)
- Average residential consumption (preferable 2000 and 2005)

The questionnaire was prepared during the months of June and July 2005 and sent to the relevant Regulators at the end of July. The first responses were received in late August and the remainder of responses, excepting Serbia, were received by the beginning of October. Serbia's submission was received in late November. The responses were compiled into a single document in October 2005 (See Annex 2 for completed questionnaires), and updated in November and December to incorporate the remaining responses.

3.   Specific Responses

This section of the report contains a summary of the transmission and distribution tariffs in each of the SEE participants to the survey. These tariffs are fully described by the questionnaire responses in Annex 2. The description of the tariffs in this section will be limited to a discussion of the type of tariff, its average levels, if applicable, and adjustment mechanisms.

3.1.   Albania

Albania has formulated a tariff system for transmission that will take effect in early 2006. A combination of price and revenue cap will be used. The price cap follows the usual "RPI-x" formulation. The revenue cap component can be activated as a safety valve if transmission tariffs become "too high".

The tariff will include system services, but will feature neither locational nor time of day features.

3.2.   Bosnia and Herzegovina

Bosnia and Herzegovina has devised a transmission tariff that is cost based. The tariff is a postage stamp type and does not contain either locational or time of day differentiation. Ancillary services are not included in the transmission tariff as a cost of system operation. The ISO and transmission rates for 2006 have been approved.

Unlike the transmission tariffs, the country's distribution tariffs, also to be implemented at the beginning of 2006, will be based on marginal costs. As we understand this response, it means that the distribution tariff will include both locational and time of use considerations.

3.3.   Bulgaria

Bulgaria has implemented a cost-based tariff that falls entirely upon the energy component. There are significant time of use elements in the tariff, but prices are uniform throughout the country. The tariff is slightly higher than either Greece or Slovenia, but only about 80% of the tariff charged in Romania.

Both the transmission and distribution tariffs are based on cost plus rate of return calculations. In the case of the distribution tariff, there is also a revenue cap. Losses are included in the price paid by customers, but there is no distinct system/ancillary services charge.

3.4.   FYROM

The Former Yugoslav Republic of Macedonia is to implement a transmission tariff at the end of 2005. The tariff will be a postage stamp type, uniform throughout the country, and will be an "incentive type" of tariff. The formula used to calculate the tariff will use the "CPI-x" form of adjustment, and will also include both correction and profit share factors in the first year of regulation. Ancillary services tariffs and fees will be included in the revenue of the country's TSO and will be part of that organization's revenues.

Distribution tariffs will exist at three voltage levels, 35 kV, 6-10 kV and 0.4 kV. The distribution tariff is calculated on the basis of a hybrid of revenue cap and price cap methods, with each method accounting for 50% of the adjustment factor. The first implemented distribution tariff is

to remain in force for three years after its introduction at the end of 2005, with annual adjustments according to the formula at the beginning of each subsequent calendar year.

3.5. Romania

Romania has a completed transmission and distribution tariff. The transmission tariff is divided into two components, a generation charge (G) and a load charge (L). The G charge is zonal, with the G charge depending on which of six zones a generator is located and connected to the grid. The L charge is also zonal, with a locational differential applied to each of the eight distribution companies. The average transmission fee is €5.69/MWh, almost equally divided between the G and L components. There is no separate charge for power or capacity in the system, and all transmission charges are levied on actual energy transactions.

To account for ancillary services costs the TSO levies a charge of €2.50/MWh. This charge is not differentiated by type of A/S or by locational or time of use factors.

Distribution tariffs are based on locational pricing for three voltages in eight zones, corresponding to the eight distribution operators (DO). Pricing is to be implemented on a price cap basis (RPI-x) with the general tariff subject to regulatory review every five years. For the initial implementation period the tariff will be adjusted after three years. Average values for the distribution tariff reflect the locational factors, and range from €2.6-5.8/MWh for high voltage, €6.3-10.0/MWh for medium voltage and €21.2-32.5/MWh for low voltage.

3.6. Turkey

As the table below shows, Turkey is the only SEE country that has lower transmission and distribution tariffs than the PJM system. Turkey's transmission tariff is comprised of G and L components that are a capacity charge only. The transmission tariff is zonal (22 zones + interconnection zone) and takes no account of either distance or time of day within each zone. The tariff is also uniform over all transmission voltages.

Ancillary services are collected from system users monthly above the transmission system revenue cap, since all A/S for non-eligible customers are purchased by the Turkish Transmission Corporation. It is possible for private companies to contract for their own supply of A/S, but the prices and terms are beyond the scope of the regulatory authorities.

Distribution tariffs in Turkey are designed by each of the distribution utilities. These tariffs are differentiated by customer class rather than voltage, though different classes stand as a reasonable proxy for voltage for industrial and large commercial users. The average level for the country is €8.06/MWh. The tariffs for each customer class are relatively simple, as there is no differentiation between energy and power in the tariff.

The PJM Interconnect, serving a 140 GW peak load in part or all of twelve states plus the District of Columbia, is the largest integrated energy market in the world (see Annex 3).

PJM uses a variety of market and simulation methods to price almost all energy services and volumes at each of a large number of locational points throughout the day (locational marginal pricing for transmission, sub transmission, distribution, capacity, energy and individual ancillary services). For a retail customer of the PJM system in the District of Columbia the transmission charge that appears on a retail bill comes out to €3.33/MWh and the low voltage distribution charge is €13.32/MWh.

PJM charges are lower for both transmission and distribution (NB, the total transmission charge for most participants to the survey includes A/S) than in most of the participants to the survey under examination. (more information on PJM is available at http://www.pjm.org) The following table shows the results of the current survey in €/MWh.

System/Participant to the survey	Average Transmission Charge (including A/S)	Average Distribution Charge (LV)
Austria	N/A	42.0
Bulgaria	4.76	7.15
Hungary	11.54	27.0
Italy	12	37.0
PJM (USA)	**3.33**	**13.32**
Romania	8.19	~27.0
Slovenia	~4.1-6.0	19.1
Turkey	3.63	8.06

Note: customers pay ancillary services charges in Italy and Slovenia. A/S charge in Romania of €2.5/MWh is included in invoice for transmission as line item.

Table 4: How Do the participants to the survey' under examination Transmission and Distribution Tariffs Compare with PJM Charges?

4. Comparative Evaluation of the Tariffs

The investigators devised seven criteria to evaluate the existing tariff information as provided in the survey responses. These criteria are listed directly below:
- Impact on investment,
- Impact on trade in electricity,
- Impacts on low-income consumers,
- Cost coverage and fiscal soundness,
- Incentives for efficiency,
- Ease of regulation, and
- Status of participants to the survey with regard to benchmarks.

Only half the SEE participants to the survey have implemented full transmission and distribution tariffs. The other participants are all in the process of preparing for an early-2006 roll-out of the new tariffs. For those SEE participants to the survey that have already implemented full transmission and distribution tariffs, the results are generally positive, though mixed in a few areas. It seems appropriate to cover some of these criteria jointly, as the results are generally similar for the two or three criteria involved. Consequently, trade and investment will be combined, as will impacts on low-income electricity users, cost coverage and incentives.

4.1. Investment and Trade

The overall purpose of transmission pricing reform is five-fold in the SEE participants to the survey. First, separate pricing of transmission and distribution promotes transparency in accounts. Second, financial unbundling makes functional or legal unbundling easier, if desired. Third, regulation of open accounts, using commonly accepted accounting methods is simpler than interpreting aggregated data. Fourth, there is important information in transmission and distribution prices regarding efficient use of system resources and investment returns which is lost when the prices are aggregated. Finally, transparency and unbundling make the predatory use of transmission services, prices and regulations to block trade or investment much more difficult.

An effective price signal from the transmission and distribution systems will assist generators, load centre managers and regulators with the means to deal with the following critical data on the transmission system:

- What is the load in the system – by time, location, season?
- What are the trends in system loading?
- Are there constraints in the system – if so, where are they and how frequently do they occur?
- Is system reliability a matter that affects users and generators – if so, how much and when?
- Does the system require new investments –if so, where and when?
- Can the system pay for itself, including future investment needs?
- Is regulation of the system predictable, transparent and equitable?

Effective and efficient prices should reflect the scarcity of system resources in time and place. Measurement and pricing of such scarcity values should proceed until the cost of obtaining

information and transacting business exceeds the value of the energy or other resources saved thereby.[12] An accurate reflection of today's situation leads to a more realistic view of future system requirements and investment needs. Finally, an effective transmission and distribution pricing system must be accompanied by a regulatory system that gives all parties confidence that the system is fair, predictable transparent and representative of actual conditions. A good transmission pricing system should make each item in the list above easier to know and to predict.

The figure below, reprised from the Summary (Section 1), shows some of the tradeoffs and elements of complexity, efficiency and regulation that affect trade and investment. This figure shows that complex tariffs, with numerous priced products, though more difficult to implement and to regulate, will generally yield better results with regard to promotion of efficiency. In general, a movement toward the NE quadrant is one that meets more of the criteria for efficiency and transparency, thereby promoting enhanced trade and investment. Conversely, the SW quadrant is one in which the tariff may be simple, but not reflective of actual conditions in the transmission system in both time and place.

Albania and the former Yugoslav republics, UNMIK, FYROM and Bosnia-Herzegovina show that a relatively simple tariff can be essentially neutral with regard to efficiency. Such an approach is not likely to induce great new investments, but is more appropriate for maintenance of an essentially built-out system. The Bulgarian tariff, with no locational elements, does not yet fully reflect the likely role of that country as an energy corridor between Turkey and Europe. As such, the country will need to consider whether more complex locational pricing will give better signals to investors in the generation and transmission businesses than does the current system. Romania's complex tarification system generally gives accurate pricing signals, appropriate to the region's major energy producer. However, distortions induced by administered small regional price differentials may vitiate some of the efficiency and transparency benefits of the current system, thereby diluting the investment-promoting elements of the pricing system.

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[12] This point captures the rationale for PJM's hybrid market and administered pricing system. Where it is more efficient to use markets PJM has a low transactional cost forum. However, where the cost of running a market might exceed the value of the savings to PJM members, then the system uses administered prices from its simulation modelling. The desire to reduce transactions costs also accounts for the price caps on market transactions. It can probably be accepted without argument that prices beyond US$1,000/MWh convey little additional useful information to either suppliers or users.
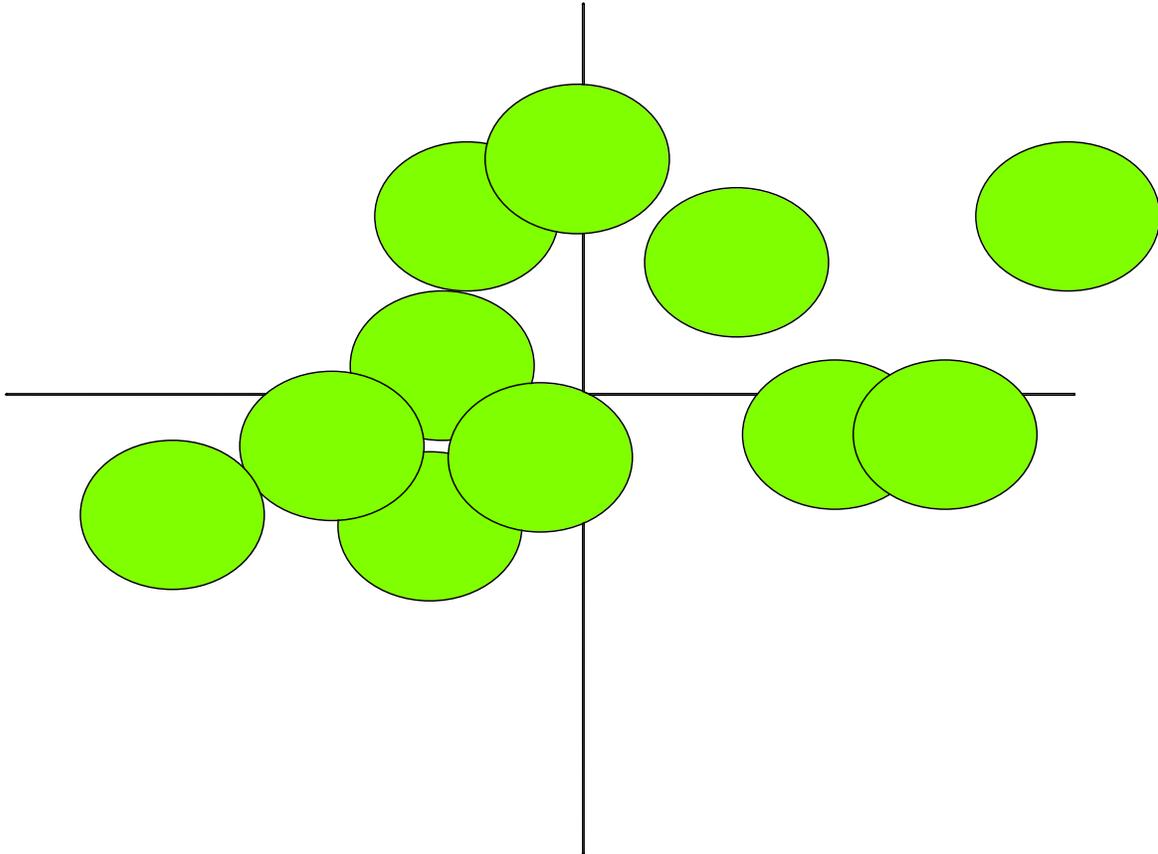
Figure 3: Regulatory Tradeoffs: Complexity vs. Ease of Regulation

4.2.   Impacts on Low Income Consumers, Cost Coverage and Incentives

The first task of a proper system of transmission pricing is that the system be able to pay for itself. If that is not the case then the price signals sent out will be of little use to investors, consumers or regulators. Moreover, any attempt to mitigate the burden of payment for electricity to some users will exacerbate disincentives in the pricing system if the system cannot cover it own costs.

Transmission tariffs on their own generally have little impact on low-electricity users. However, to the extent that there are significant subsidies at the retail level, it is generally easier to pay for these subsides via transmission system charges than through other means, especially if the amounts involved are significant relative to overall retail sales revenues.[13]

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[13] The monies needed to balance the transmission and distribution accounts will be greater, the more significant is the extent of the subsidy regime. Most systems can afford to subsidize a few consumers, but any widespread program will lead to distortions in pricing given the amount of the subsidy relative to the actual costs to be covered for T & D themselves.

Cost coverage for one or two of the SEE participants to the survey is probably adequate, though this cannot be known with certainty absent an audit of costs. However, looking at the costs of EU members Slovenia, Italy, Austria and Hungary as indicative, it would appear that Bulgaria and Turkey probably do not charge enough to cover costs on a forward basis, especially considering the large investments that both countries probably need to make in network expansion and enhancement (see Table at end of Section 3). Tariff data for some of the former Yugoslav republics, to be provided some time in 2006, are required in order to confirm or deny this finding.

If cost coverage is minimal, then the impacts of subsidies to low income users are potentially significant. Comparisons of the generation cost data in the survey responses with the stated regulated retail tariffs indicate some degree of apparent cost shifting away from retail users to other classes of consumers, including industry and commercial customers, as well as larger residential users.[14] However, the results vary greatly from one participant to the survey to another. UNMIK and Romania appear to charge enough to users to cover all costs, while FYROM and Bulgaria sell electricity for less than its apparent cost of supply.

Incentives to users of electricity will be perverse if the product is subsidized. That is, price signals will not tell users when to reduce demand, when to shift to other technologies or fuels or when to invest in new capacity. Moreover, in those participants subsidizing electricity supply, the supply companies are unlikely to have sufficient funds to invest in new capacity if they are selling at a loss, an inevitable outcome of true financial unbundling.

4.3.   Ease of Regulation and Progress Assessment

Most of the participants to the survey that have responded have designed systems that feature price and revenue caps. Such systems tend to be simpler than cost plus ROR regulation, since adjustment only needs to be made every 3-4 years, reducing the need for a large and specialized regulatory expert staff. The key issue with such systems is to get the prices correct in the first instance. In particular:

- Historical costs need to be updated according to an accepted and reasonable methodology,
- Stranded costs must be resolved in the most direct and expeditious manner,
- Metering needs to be expanded wherever possible to make greater time and locational price distinctions possible as the system evolves, and
- A methodology for incorporating new investments into the pricing scheme must be part of the initial pricing implementation.

On this basis it would appear that the record of the SEE participants to the survey is mixed. Some are still struggling with updating historical costs, defining stranded costs and making provisions for new investments. In this category one might generally locate Bosnia-Herzegovina, Bulgaria, and FYROM. Romania, UNMIK and Albania appear to have made more of a clean break with the past accounting methods. Turkey seems to have an effective locational price methodology that makes explicit provision for new investments, but the overall level of prices seems to be too low to truly cover all costs.

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[14] Cost shifting from small residential users to larger residential and commercial users is a feature of Italy's tariff system as well. However, the magnitude of the cost shifting is evident from the distribution tariff data and is applied to just the first block of residential use.

5.   Regulatory Issues

All SEE participants to the survey now have electricity regulatory bodies. In some cases this regulator also oversees other energy commodities, especially natural gas.

With regard to the transmission and distribution tariffs, most of the regulators have a role that is limited to oversight, approval and, sometimes, enforcement. Where historical costs are used as the basis of the tariff, it is the job of the regulator to perform the following functions:
- Audit and evaluation of data quality,
- Maintenance of the historic cost database,
- Determination of the precise boundaries of the regulated core business,
- Choice of and resolution of disputes regarding various parameters used in tariff calculations (e.g., cost of capital, return on capital, productivity changes, inflation indices, etc.), and
- Valuation changes due to reorganizations or merger/acquisition/disposal activity.

In addition to these well-understood functions, it is also the job of some regulators to oversee more complex activities of the TSO and distribution companies. In particular, the regulator needs to be conversant with the planning tools used by the companies so that they can assess the adequacy of capacity planning and investment solutions and the economic rationale for new investments that will be placed into the consumer rate base.

Some types of tariffs are more amenable to simple regulation than are others. For example, cost and price caps require fewer adjustments, fewer parameters and less analytical overhead than does a cost of service tariff. In the former case, the analytical work needs to be performed only occasionally, often by outside consultants, reducing the need for the regulator to carry a large analytical staff that may not be fully employed the rest of the time. The cost of regulation itself is generally reduced under such circumstances. Where a cost of service approach is used, the regulator needs to maintain a significant skilled staff capable of performing the necessary financial analysis and system simulation work.

With most of the SEE participants to the survey opting for price or revenue cap structure, they will be able to implement fully operational tariffs relatively quickly. The multi-locational and multi-period tariffs, such as the one in Romania, require additional regulatory resources, since the number of parameters and measurements rises dramatically in such circumstances.[15]

The most complex tariff among the respondent participants seems to be Romania, with multiple zones and time periods. However, since Romania is a significant energy producer and electricity exporter, the cost and difficulty of establishing a complex tariff has significant potential payoffs, since new generators will get appropriate, useful and necessary pricing signals about investment locations and types of services to offer the system, in addition to active power and energy.

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[15] It is interesting to note that the regulators of the PJM system continually complain that the simulation methods used by the RTO are "too complex" and opaque. Of course, the heavy use of such methods is in part behind the success of the RTO as a cost reducer for its members. In the case of such a large system, simpler is not necessarily better, but the level of specialization of function and measurement that occurs in PJM may not be cost effective for smaller systems (cf Adam Smith: "the division of labour is limited by the extent of the market").

Some of the participants to the survey may find that a simple tariff works well, especially if they are to be primarily conduit nations for larger plants located elsewhere. This is probably the case for the FYROM and UNMIK, among others. It is also generally true that if a system is mature, then increasingly complex tariffs and regulations will not result in much performance improvement. Such a result probably holds for Hungary as well. In the case of Turkey, an examination of the tariff indicates that the current transmission tariff probably does not go far enough in facilitating trade with the other participants. Given the country's position with regard to gas supplies and its mix of coal base load and gas-fired CCGT generation units, there is probably a need for more locational and temporal pricing signals for generators.

Some of the participants to the survey may have political and regulatory issues that are beyond the scope of this study. In some cases these issues (e.g., local land taxes in Romania) may blur the pricing distinctions that have been designed into the tariff system by introducing distortions in prices.

One of the most difficult problems comes from the valuation of assets and liabilities from previously unified systems. In such cases it is critically important to get the initial valuations correct. One way to do this is to consider limited asset sales so as to establish proxy prices for the remainder of the assets. In the former Yugoslave republics, it is probably more appropriate to look at the simplest possible tariff system, given the tradeoffs between cost of regulation and potential gains from complexity in these smaller markets.

Up to the present time SEE participants to the survey' regulatory agencies have been largely occupied with retail tariff issues and secondarily with organizing, approving and implementing the new transmission and distribution tariffs. For the financial survival of the national electricity companies and due to the large involuntary restructuring requirements imposed on many of the utilities, devising retail tariffs that permit a reasonable fit between financial requirements and incentives for efficient use and investment has been given first priority.

This financial and operational restructuring has forced on many of the SEE participants to the survey the type of service and segment unbundling that they would, in any event, be required to undertake for participation in the EU internal electricity market. Assistance at this stage is primarily about getting three things implemented correctly from the beginning:
- Asset values for historical assets,
- Measurement of actual energy and power flows, and
- Forecasting of required investments for normal operations and system upgrades.

This means additional metering and measurement investments and data analysis. It also means that asset valuation should be taken very seriously, perhaps to the point of obtaining second and even third opinions on appropriate asset values. Finally, for purposes of tariff formulation, it is critical to distinguish among the following system characteristics with regard to future investments:
- Is the demand for electricity rising or falling?
- Are there structural factors in the participant's economy that will induce electricity use to rise/fall over the next 10-15 years?
- How much account does transmission planning take of generation and transmission resources in neighbouring countries? How much trade currently occurs? Is it likely to rise or fall over the next 10-15 years?
- How much of the existing transmission and distribution network is functionally obsolete?
- What are the probable efficiency benefits, measured with true generation opportunity costs, of network improvements?

These questions form the heart of continuing investigation of the transmission and distribution tariff issues, and should be pursued over the next 12-18 months by the Working Group.

Annex 1: Tariff Questionnaire

The questionnaire created for the survey is shown below.

No.	Subject	Information type	Comments
1.	**Transmission tariffs**		
1.1.	Existence of transmission tariffs	Y / N	
1.2.	Description of transmission tariffs (voltage levels, components, time of use values, zonal or country uniform, tariffs applying to whom, etc.)	text	
1.3.	Tariff methodology (including role of the TSO and role of the regulator in setting the tariffs, setting periodicity, etc., regional differentiation), note if tariff contains incentives for quality and consistency of service or consumption	text with formulae	
1.4.	Average values:		
	• Average transmission fee – total	€/MWh	L = load component, paid for extracting energy from grid
	• Average transmission fee – power part	€/MWh	G = generator component, paid for introducing energy in the grid
	• Average transmission fee – energy part	€/MWh	
	• Average G component – total	€/MWh	
	• Average G component – power part	€/MWh	
	• Average G component – energy part	€/MWh	
	• Average L component – total	€/MWh	
	• Average L component – power part	€/MWh	
	• Average L component – energy part	€/MWh	
	Average values as for Q1 and Q2 2005	€/MWh	
	Values are calculated as per 1 July 2005 for:	€/MWh	

No.	Subject	Information type	Comments
	Transaction of P = 40 MW; Reference utilization time: 5,000 hours; The producer and the consumer are in two differentiated areas with a distance of at least 250 km (or maximum value according to country's dimension); Producer located in the north and consumer located in the south of the country.	NOTE: If any component is differentiated on basis of time of use values, please provide distinct values with the format: €/MWh (xx hour – yy hour)	
1.5.	Cost structure:		
	Costs connected to TSO activities : infrastructure (capital and all operation charges), losses, system services, congestion;	%	
	Average cost of losses	€/MWh	If loses are not considered in the tariff, value should be zero
	Average cost of system services	€/MWh	
	Other burdens not directly related to transmission costs: stranded costs, public interest contribution renewable energy, universal access fees or other charges.	€/MWh	
	Description of other burdens.	%	
	NOTES:	text	
	These splitting consider costs covered through transmission tariffs and not using other distinct tariffs or fees.		
	This splitting is considered for the same case of applying transmission tariffs as in point 1.4.		
2.	**Ancillary services tariffs**		
2.1.	Existence of distinct ancillary services tariffs	Y / N	
2.2.	Description of ancillary services tariffs (including to whom are applicable)	text	
2.3.	Tariff methodology (including role of the TSO and role of the regulator in setting the tariffs, setting periodicity, etc.)	text	
2.4.	Average values:		
	Components as per description – note if any services can be provided by user or	€/MWh	

No.	Subject	Information type	Comments
	if market pricing for some services exists (e.g., reserves) Values are calculated for: Transaction of P = 40 MW; Reference utilization time: 5,000 hours; The producer and the consumer are in two differentiated areas with a distance of 250 km (or maximum value according to country dimension); Producer located in the north and consumer located in the south of the country; Values valid as per 1 July 2005. Energy and power charges used for calculations of ancillary service fees	NOTE: If any component is differentiated on time of use values, there will be provided distinct values with the format: €/MWh (xx hour – yy hour) €/MWh	
3.	**Distribution tariffs**		
3.1.	Existence of distinct distribution tariffs	Y / N	
3.2.	Description of distribution tariffs (including to whom are applicable)	text	
3.3.	Tariff methodology (including role of the distributor and role of the regulator in setting the tariffs, setting periodicity, etc.)	Text with formulae	
3.4.	Average values:		
	• Average tariff – total	€/MWh	
	• Average tariff – power part	€/MWh	
	• Average tariff – energy part	€/MWh	
	NOTES: If tariffs are differentiated on voltage levels, average tariffs on each voltage level should be also given in the form: Voltage level Fixed monthly charges by voltage level Energy charge If any component is differentiated on time of use values, there will be provided distinct values: Values valid as per 1 July 2005.	kV €/kW €/MWh €/MWh (xx hour – yy hour)	Could be a range
4.	**Regulated retail tariffs**		
4.1.	Description of retail tariffs (including social tariffs or other special tariffs if applicable)	text	
4.2.	Tariff methodology (who sets the tariffs, how often, what principles are applied, etc.)	Text with formulae	

No.	Subject	Information type	Comments
4.3.	Values for consumers		
	Average annual price – total	€/MWh	
4.4.	Values for industrial consumers		
	Average annual price – total	€/MWh	
	Monthly fixed charge	€	
	Average annual price – power part	€/MWh	
	Average annual price – energy part	€/MWh	
	Note different tariff categories, if applicable	Power or energy switch points	
	For time of use tariffs:		
	Average day rate / average night rate	Value and %	
	Values valid as per year 2004.	€/MWh	
	Values per category, according to EUROSTAT methodology in annex.		
	Values valid as per 1 July 2005.		
4.5.	Values for commercial consumers		Only if different rates than those applied for industrial consumers are applied for commercial use (usually shops)
	Average annual price – total		
	Monthly fixed charges – note if fixed charges vary by usage category (C1, C2, etc.)		
	Average annual price – fixed part	€/MWh	
	Average annual price – energy part	€	
	For time of use tariffs:	€/MWh	
	Average day rate / average night rate	€/MWh	
	Values valid as per year 2004.		
	Values valid as per 1 July 2005.	Value and %	
4.6.	Values for residential consumers		
	Average annual price – total	€/MWh	
	Monthly fixed charges – note if fixed charges vary by usage category (R1, R2, etc.)	€	
	Average annual price – fixed part	€/MWh	
	Average annual price – energy part	€/MWh	

No.	Subject	Information type	Comments
	For time of use tariffs:		
	Average day rate / average night rate	Value and %	
	Values valid as per year 2004. Values per category, according to EUROSTAT methodology in annex. Values valid as per 1 July 2005.	€/MWh	
4.7	Values for Government consumers Average annual price – total Monthly fixed charges – note if fixed charges vary by usage category (G1, G2, etc.)		Only if different rates than those applied for industrial consumers are applied for Government facilities
	Average annual price – fixed part	€/MWh	
	Average annual price – energy part	€	
	For time of use tariffs:	€/MWh	
	Average day rate / average night rate Values valid as per year 2004. Values valid as per 1 July 2005.	Value and % €/MWh	
4.8.	If special tariffs are used for social reasons:		
	Description social tariffs (for instance description of usage cut off levels for social tariffs, tax exemptions etc.)	text	
	Average annual price – social tariffs	€/MWh	
	Average annual price – other residential tariffs	€/MWh	
4.9.	Collection rate in 2004		
	Industrial consumers	%	
	Commercial consumers	%	
	Domestic consumers	%	
	Government consumers	%	
4.10	Trends in collections by retail category Provide data for 2000-2004	Text and trend evaluation for each category	
5	**Competitive retail tariffs**		
5.1.	Average price on the competitive retail market	€/MWh	Prices applied to eligible consumers on the competitive market
5.2.	Real market opening share	%	% of total final consumption

No.	Subject	Information type	Comments
6.	**Generation prices (or costs) as of 1 July 2005**		**Prices / costs considered in the regulated retail tariffs**
6.1.	Hydro power plants	€/MWh	
6.2.	Coal fired power plants	€/MWh	
6.3.	Oil fired power plants	€/MWh	
6.4.	Gas fired power plants	€/MWh	
6.5.	Nuclear power plants	€/MWh	
7.	**Others**		
7.1.	VAT	€ / MWh	
7.2.	Other taxes applicable to electricity:	Text (description)	
		Values	
7.3.	Subsidies (2004) • Subsidies to utilities • Subsidies to industrial consumers • Subsidies to residential consumers • Write-offs of various consumer uncollectibles	Text (description) with formulae, if they exist	
		% of total costs	
		% of total costs	
		% of total costs	
		% of total costs	
7.4.	Average income per family (preferable July 2000 and July 2005)	€ / month	
7.5.	Average residential consumption (preferable 2000 and 2005)	kWh/year	

Table 5: Tariff Questionnaire

Annex 2: Questionnaire Responses

N/A = Not available

Participants to the survey	Existence	Description	Tariff Methodology
Albania	N (During 2005 the tariff methodology was issued by the regulator and it is expected that the regulator will approve tariffs for 2006.)	The transmission tariff should recover the cost of the following activities: • Ownership, construction, operation, and maintenance of lines, cables, transformer substations, dispatch centres, and related buildings and communication facilities. • The cost to the OST of operating reserves needed to ensure the stability and security of the transmission system. These reserves are obtained on a contractual basis from large hydropower stations located in Albania. • The cost to the OST of other ancillary services, including payments made to neighbouring OSTs to obtain an assurance of emergency power and instant reserves, and payments (if any) for frequency and voltage regulation. • Reactive power compensation costs, which should be allocated to a reactive power charge. • The cost of providing office space, communications, and IT facilities to the Market Operator plus the personnel costs related to the Market Operator. From an accounting standpoint the Market Operator should have its own accounts, as if it were an independent legal entity with taxable income.	Transmission tariff is a combination of price and revenue caps. A tariff is approved for a period of three years and prices are limited to the RPI-x formula. However, if tariffs become "too high" then prices are adjusted downward in the following year. Further, it is intended that transmission tariffs not be "too high" relative to those of a comparable well-run system. To this end, the tariff methodology authorizes periodic benchmark reviews of the entire cost structure of the tariff.
Bosnia Herzegovina	Y	At the moment, all customers of the transmission system (high voltage lines) are charged with the ISO and transmission tariff (in € / kWh) regardless the voltage level to which they are connected and the time of use.	The regulator approves tariffs for ISO (Independent System Operator works on balancing, dispatching and etc.), transmission company (use of network tariff) and ancillary services. Tariffs are cost-based and there are no incentives and regional differentiation.
Austria	Y	In Austria there are two relevant transmission zones.	Post stamp tariffs Tariff reviews are carried out by E-Control on behalf of the Energy Control Commission, using questionnaires and in situ audits. The following principles are applied to cost analysis: • The costs are calculated on a full average historic cost basis, taking finance costs into account.

Participants to the survey	Existence	Description	Tariff Methodology
			• When calculating the cost of the construction, expansion, maintenance and operation of an electricity network, only such expenses as are deemed reasonable in their origin and amount are taken into account. • Network costs for a given tariff determination period are largely derived from the balance sheet and income statement contained in the operator's annual financial statements. The sustainability of the expenses and income for the tariff determination period is examined, and they are normalized in exceptional cases, giving reasons. Normalization ensures that non-recurrent expenses and income are replaced by amounts corresponding to the long-term averages. • The cost base for the use of system charge is determined on a historic cost basis, meaning that increased valuations due to company disposals or reorganizations (e.g. goodwill) are eliminated. This prevents double counting of costs. • Finance costs are calculated on the basis of the weighted average cost of capital (WACC), i.e. the weighted rate of interest paid by system operators on the debt and equity capital employed. This is currently put at about 6% before tax.
Bulgaria	Y	Voltage levels **HV, MV & LV** Time of use: Peak load, day load & night load	SEWRC approved the tariffs based on proposals from TSO on annually basis SEWRC approves the ROR in ROR method of regulation L and G components are not used to set transmission tariffs, all charges go to the energy portion.
Greece	Y	All users (generators, suppliers and consumers) of the transmission system (high voltage lines of the interconnected system including interconnections) are charged with the transmission tariff (in €/MW) regardless the voltage level to which they are connected and the time of use. The transmission tariffs for the generator (G) are zonal and for the customer (supplier, consumer) (L) are uniform throughout Greece.	PPC SA is by Law the exclusive owner of the electricity Transmission System, the interconnections and any future System expansion. The operation of the Transmission System is assigned to an Independent Transmission System Operator, namely 'Hellenic Transmission System Operator S.A.' HTSO SA (51% Greek State, 49% PPC S.A). Transmission tariffs are calculated on the basis of the annual system cost, which is defined as the sum of the annual barter owed by the HTSO to PPC SA (i.e. the sum of the annual

Participants to the survey	Existence	Description	Tariff Methodology
			depreciation of the assets of the Transmission System, its operational and maintenance expenses and the return on the non-depreciated capital of the Transmission System, with the rate of return being approved by RAE) and the annual cost of any works for the expansion of the System, which are paid by the HTSO. The annual system cost is adjusted to also take into account the differences between the forecasted and realized transmission expenses during the previous year.
			System charges are allocated to generation -including imports- (G) and load –including exports- (L) according to a 30% - 70% split until 1 January 2006 (according to the 2001 Grid Code), which will then change to 15% - 85% (according to the 2005 Grid Code). The G charge is applied on the maximum net output of thermal units and on 50% of the maximum net output of hydro units, as these are referred to in the respective generation licenses. Priority dispatch renewable and CHP generators are not charged for use of the transmission system; however the respective charges are calculated (on the basis of 50% of their maximum net output) and recovered through uplift. The L charge is applied on the consumer annual average maximum demand; that is the arithmetic average of the hourly maximum demand of the consumer that is recorded on the hour of the summer and winter system peak demand and on the hour of the annual peak demand of the consumer. As mentioned in 1.2, the L component is uniform throughout Greece, while G has a zonal variation. According to the 2001 Grid Code, Greece was split into three zones (Attiki-Viotia, where G was zero, Northern Greece, Western & Southern Greece), while the 2005 Grid Code provides for a two zones' approach (Attiki-Viotia, where G is zero, and the rest of the interconnected system). The division of the Interconnected System in two zones with respect to the calculation of the G charge will come in effect on January 2006.
			The role of RAE in the procedure of the definition of the Transmission Network Tariffs is mainly advisory. The final approval of the tariffs is performed by the Minister of Development, following the opinion of RAE. However,

Participants to the survey	Existence	Description	Tariff Methodology
			according to the Grid Code, RAE approves various elements of the cost base of the tariffs, such as the annual cost of the System, including the annual barter owed by HTSO to PPC SA and the annual operating cost of the System, and also the calculation of the use of the system charges.
Hungary	Y	Presently in Hungary there is an independent system operator (ISO) and a transmission company. Both tariffs are of post stamp and country uniform character, with energy charge only, zero G component. From 1/9/2005, the new amendments to the Law on Electricity have formed the TSO. The tariffs do not reflect this legal action yet.	"Cost plus" type price regulation. In the case of ISO there is a cost & asset review each year performed by the regulator. Transmission: 4 year long price regulation period (cost & asset review every fourth year, with yearly price maintenance). The regulator makes each year price proposal to the minister of economy and transport. This latter is the price setting authority.
Italy	Y	The transmission tariffs charged by distributors are set directly by the Authority. Transmission tariffs are time differentiated for customers who possess meters able to measure energy consumption in the different relevant periods F1, F2, F3 and F4.	Transmission costs are pure pass through costs for distributors. Equalization of transmission costs for distributors.
UNMIK	N This is in process and the transmission tariff will be in place begin September 2006		Tariff Methodology will be ready October 2005
FYROM	Y	It will entail two voltage levels: - 400kV - 100kV Transmission tariffs will be the same for all territory of Republic of Macedonia. The MEPSO company has been separated from the vertically integrated company at the beginning of year 2005 and according to the Rulebook for regulating electricity prices the company shall apply for approval for revenue and price, which has not been done yet.	The role of the TSO is to provide: transmission of electricity, secure and efficient operation of the transmission system, coordination with the OTS, to publish the transmission grid code after approval from the ERC, to submit financial and operation reports to the ERC, etc. The role of ERC is to pass a methodology for regulating electricity prices, the tariffs and to control prices during the regulated period. The first regulated period is set to 3 years duration. Regional differentiation does not exist. The methodology is incentive based with application of the revenue cap method which includes incentives for quality and consistency of service and consumption.

Participants to the survey	Existence	Description	Tariff Methodology
			The formula is the following: MARt = MARt-1*(1 +CPIt)* (1 –X)-Kt St
Romania	Y	The transmission tariff is divided in two components: • Generator (introducing) component - G, paid by generators. This is a zone tariff, depending on the zone the generator is connected to the transmission grid. For this component are defined six zones. Load (extracting) component - L, paid by suppliers for the energy supplied to the consumers. This component is a zone tariff too (eight zones, corresponding to the eight distributors).	The transmission tariffs are established on the basis of a specific methodology. The regulator (Romanian Energy Regulatory Authority – ANRE): • approves (issues) the methodology, • sets the regulated revenue for the transmission service, for a regulatory period, before the start of this period, • approves the transmission tariffs TSO will keep a separate evidence of all financial contributions received annually. The value of such contributions is send annually to the regulator.
Slovenia	Y	Tariffs are differentiated by voltage levels (high, medium and low voltage) and utilization time (above 6000, above 2500 hours and lower). The tariffs are distinguished by time of day (day/night) and by the season (two/three categories). They consist of the capacity component (kW) and energy component (kWh). The Tariff Code distinguishes 7 levels. The tariffs are uniform for customers over all of the country. The generators do not pay transmission tariffs.	Consumer pays for the level to which he is connected and all other network levels above it. The regulator sets the tariff methodology (incentive based) for a regulatory period, the first one 2003 – 2005, new under preparation for 2006 – 2008. Tariff methodology is based upon the 'CPI – X' principle and it uses CAPM and price cap. The regulator calculates (sets) the tariffs also. No regional differentiation. Quality will be monitored during the second regulatory period and an incentive will be developed probably for the next regulatory period.
Turkey	Y	Tariffs based on power (MW). Zonal tariffs applied. (23 zones = 22 zones + 1 interconnection zone) No voltage differentiation No time of use differentiation	TSO proposes the revenue requirement and associated parameters (OPEX, CAPEX, Stranded Cost, WACC, Amortization periods, etc.). Regulator determines and/or approves the recap and the parameters. Implementation period is defined as the period during which the parameters are valid. Tariffs should be performance based.
Serbia	N	A transmission tariff is expected to be promulgated later in 2006.	
Montenegro	N/A		

Table 6: Transmission Tariffs

Participants to the survey	Average Value	Cost Structure
Albania	N/A	Tariff will include capacity reservation charge, energy charge and monthly fee.
Bosnia Herzegovina	5,01 €/ MWh transmission tariff 0.175 €/ MWh ISO tariff	All on energy transmitted
Austria	N/A	Costs connected to TSO activities : infrastructure (capital and all operation charges), losses, system services, congestion; Average cost of losses 32 €/MWh Average cost of system services N/A Other burdens not directly related to transmission costs: stranded costs, public interest contribution renewable energy, universal access fees or other charges. • Description of other burdens. N/A
Bulgaria	Average transmission fee – total 4.76 €/MWh	All on energy transmitted
Greece	Average transmission fee – total 4.35 €/MWh Average transmission fee – power part Average transmission fee – energy part Average G component – total 1.305 €/MWh Average G component – power part Average G component – energy part Average L component – total 3.045 €/MWh Average L component – power part 0 €/MWh Average L component – energy part 2.83 €/MWh Average values as for Q1 and Q2 2005 Values are calculated as per 1 July 2005 for: • Transaction of P = 40 MW; • Reference utilization time: 5,000 hours; • The producer and the consumer are in two differentiated areas with a distance of at least 250 km (or maximum value according to country's dimension); Producer located in the north and consumer located in the south of the country. Prices do not differentiate on basis of time of use. For the Transmission System, in 2004, the annual G charge was 0, 5.924,8 €/MW and 10.737,7 €/MW for the three zones (Attiki-Viotia, Northern Greece, Western & Southern Greece)	The operating expenses of the HTSO are not covered by the Transmission Network Tariffs. The annual budget of the HTSO, as approved by the Minister of Development, following the opinion of RAE, is debited in a regulated account which forms part of the Uplift Account. The Uplift Account is also used for the coverage of the cost of the ancillary services and for resolving system constraints. The cost of losses on the Transmission System is borne by Generators (including Importers). To balance the Uplift Account, a charge is imposed to all suppliers and self-supplied eligible customers in proportion to their share in total consumption. None of the costs referred to are included in the Transmission Tariffs.

Participants to the survey	Average Value	Cost Structure
	respectively. According to RAE's calculations, the average cost of transmission system use was 4,35 €/ MWh, based on the total energy consumption on the Interconnected Transmission System in 2004. Given the 30% G split, this cost led to an average G charge of 1,305 €/ MWh. The corresponding average L charge was 17.797 €/ MW. These tariffs shall remain in force during 2005.	
Hungary		Costs connected to TSO activities : infrastructure (capital and all operation charges), losses, system services, congestion: 54% (In percentage of transmission & system operation charges)
		Average cost of losses 0,367 €/MWh (considered in the system operation tariff)
		Average cost of system services (Transmission & system operation charges)
		• 8,19 €/MWh (customers with transmission network connection)
		• 9,00 €/MWh (customers with distribution network connection)
		Other burdens not directly related to transmission costs: stranded costs, public interest contribution renewable energy, universal access fees or other charges. 45,4 % renewable & cogeneration support, charge for stranded costs
		(In percentage of transmission & system operation charges)
Italy	N/A	ALLOWED COSTS FOR REGULATED SERVICES (transmission, distribution and metering) for 2004-2007 period:
		Average unit costs incurred by the major Italian companies, covering about 98% of the electricity transported in Italy.
		Data extracted from 2001 companies unbundled accounts.
		operating costs
		+
		depreciation
		(life span relevant for infrastructures depreciation is set by the Authority, in line with the average life span used in other European countries)
		+
		a fair return on net invested capital
		(invested capital * WACC)

Participants to the survey	Average Value	Cost Structure
		Operational costs - profit sharing: • Any operating cost reduction achieved in the first regulatory period, as a result of productivity gain over the 4% per-year target, has been shared between electricity companies and customers. • The companies' share of the extra-gains was set at 50% as required by law no. 290/03. $$WACC \ (pre \ tax) = \frac{\left[1 + \left(\frac{Ke}{(1-T)} * \frac{E}{(E+D)} + Kd * \frac{(1-tc)}{(1-T)} * \frac{D}{(E+D)} \right) \right]}{1+rpi} - 1$$ Where: Ke is the return allowed on equity T is the tax rate E is the equity D is the debt Kd is the debt rate tc is the tax shield rpi is the expected average inflation rate The allowed return on equity has been calculated according to the CAPM methodology. CAPM is a model describing the relationship between risk and expected return that is used in the pricing of risky securities. CAPM says that the expected return of a security or a portfolio equals the rate on a risk-free security plus a risk premium.
UNMIK		Unbundling of KEK is in process – starts 1st January 2006
FYROM		
Romania	Average transmission fee – total 5.69 €/MWh Average G component – total 2.86 €/MWh Average L component – total 2.83 €/MWh Average values as for Q1 and Q2 2005 Values are calculated as per 1 July 2005 for: • Transaction of P = 40 MW; • Reference utilization time: 5,000 hours; • The producer and the consumer are in two differentiated	Average transmission fee – power part 0 €/MWh Average transmission fee – energy part 5.69 €/MWh Average G component – power part 0 €/MWh Average G component – energy part 2.86 €/MWh Average L component – power part 0 €/MWh Average L component – energy part 2.83 €/MWh

Participants to the survey	Average Value	Cost Structure
	areas with a distance of at least 250 km (or maximum value according to country's dimension); Producer located in the north and consumer located in the south of the country.	
Slovenia	Average transmission fee – total 4,1€/MWh • - Average G component – total €/MWh • - Average G component –capacity part €/MWh Average G component – energy part €/MWh Average L component – total 4,1€/MWh Average L component – capacity part 2,4€/MWh Average L component – energy part 1,7€/MWh	Transmission losses are calculated as 2 % of the transmitted quantity (MWh), not cost. Losses are purchased by the TSO on the market and are part of the transmission tariff. Transmission tariff does not include any of these supplements. However, the preferential dispatch supplement is added to the transmission/distribution tariff.
Turkey	Average transmission fee – total 1.37 Euro/MWh (11,978 €/MW) Average transmission fee – power part 1.37 Euro/MWh (11,978 €/MW) Average transmission fee – energy part No Average G component – total 0.38 Euro/MWh (3,303 €/MW) Average G component – power part 0.38 Euro/MWh (3,303 €/MW) Average G component – energy part No Average L component – total 0.99 Euro/MWh (8,675 €/MW) Average L component – power 0.99 Euro/MWh (8,675 €/MW) Average L component – energy part No (Calculated via assuming 8760 hours a year.) Exchange rate (local currency/€), average of Q1 and Q2 2005: YTL/€=1.96 Transmission tariff is neither distance nor utilization time related	Revenue cap structure is as follows; • 49.8% Opex • 35.8% Capex • 14.4% Stranded Cost **Opex** The regulatory operating expenditures shall cover the following in line with the Uniform Accounting System: • the cost items that are monitored under "Cost of Sales" account and are directly related to the activity (such as labour, maintenance, material, outsourced services and goods, excluding depreciation costs); • related portion of the indirect cost items that are monitored under "Operating Expenditures" account (excluding deprecation and leasing costs), • related portion of the "Expense and Loss from Other Operations" account and "Other Extraordinary Expense and Loss" account, subject to approval of the Authority. **Capex** The net regulatory capital expenditures shall be calculated by deducting regulatory asset disposal revenues and regulatory customer contributions from the regulatory capital expenditures; while non-regulatory asset disposal revenues and capital expenditures shall not be kept in regard during such calculations. **Stranded cost** the stranded liabilities shall be determined by the Board with due regard to the existing financial liabilities as of the start of the first implementation period and Liquid Assets and Marketable Securities that may be used to finance such liabilities. The financial

Participants to the survey	Average Value	Cost Structure
		liabilities that are not used to finance regulatory capital expenditures shall not be kept in regard. Since the tariffs are based on capacity (MW), system losses are not taken into account.
Serbia	N	
Montenegro	N/A	

Table 7: Transmission Tariffs (Continued)

Participants to the survey	Existence Of Distinct Ancillary Service Tariffs	Description	Tariff Methodology (Including The Role Of TSO And Regulator)	Average Values
Albania	N – Reactive power tariff will be issued in 2006 as part of new transmission tariff	Reactive power supplied by transmission system operator (OST) will be included as a part of the transmission tariff to all users.	Part of overall tariff structure and level to be approved by regulator.	Not calculated yet
Bosnia Herzegovina	N (in 2007)	'Dry run' is expected to be performed during 2006. Ancillary services are embedded in final customers tariff.	The regulator approves tariffs and the role of ISO is to schedule and administer services.	Not calculated yet
Austria	N	-	-	-
Bulgaria	N	-	-	-
Greece	Y	An Uplift Account is used for the coverage of the cost of the ancillary services and for resolving system constraints. To balance the Uplift Account, a charge is imposed to all suppliers and self-supplied eligible customers in proportion to their share in total consumption. This charge is approved annually by the Minister of Development following a proposal by RAE	As there is no experience of cost analysis for the ancillary services so that this cost is separated from the usual operation costs of the power stations, the cost of the ancillary services for the calculation of the charge for the ancillary services proposed by RAE in 2002 (and still valid today) is based on best estimates and international benchmarking.	The fee paid by all suppliers in order to cover the expense for provision of ancillary services is set to 0,35 €/MWh (for 2004).
Hungary	Y	Post stamp country uniform	Set together with system operation charges	2.54 €/MWh
Italy	Not regulated Competitive bidding mechanism in place	The Electricity Exchange is composed of a day-ahead market (MGP), an adjustment market (MA) and a dispatching services market (MSD). On the MSD, the GRTN obtains the ancillary services needed to ensure the equilibrium of the system	No	-
UNMIK	N

In process and distinct ancillary service tariffs will be in place begin October 2006 | | Tariff Methodology will be ready October 2005 | |
| FYROM | N | | The costs for ancillary services are | |

Participants to the survey	Existence Of Distinct Ancillary Service Tariffs	Description	Tariff Methodology (Including The Role Of TSO And Regulator)	Average Values
			included in the formula for regulating revenue for the TSO	
Serbia	N			
Montenegro	N/A			
Romania	Y			2.5 €/MWh
Slovenia	Y	Ancillary services are paid by the customers. Tariffs relate to the capacity only.	Tariffs are set by the regulator, based upon the costs the TSO has, and the proposals (in the process of public procurement) the TSO receives	Components as per description – note if any services can be provided by user or if market pricing for some services exists (e.g., reserves) 2,1 €/MWh This value is calculated on the basis of the total annual consumption. But the ancillary services are charged only in proportion to the capacity (EUR/MW)
Turkey	N	Services to be provided by all legal entities connected to the transmission and/or distribution system, as per the Grid Regulation and/or the Distribution Regulation.	System operation part of tariffs includes the operation of the balancing mechanism, load dispatch and the procurement of ancillary services. Fixed component of the ancillary service costs is included in the transmission use of system charges, variable component (need of reactive energy, frequency) is reflected pass through to the system users (generators and consumers) via capacity values (MW).	N/A Note: Turkish Transmission Corp. is responsible for purchasing all kind of ancillary services. Ancillary services are classified in the Grid Code. EMRA may supervise costs of mandatory ancillary services. The commercial ancillary services are not subject to regulation.

Table 8: Ancillary Service Tariffs

Participants to the survey	Existence Of Distinct Distribution Tariffs	Description	Tariff Methodology Including The Role Of Distributor And Role Of Regulator)
Albania	N (During 2005 the tariff methodology was issued by the regulator and it is expected that the regulator will approve tariffs for 2006.)		
Bosnia Herzegovina	Y	The distribution tariff is differentiated on voltage level. There are several distribution system operators (DSO) and for each DSO is determined the individual set of tariffs, corresponding to voltage level. The distribution tariff is paid by the consumers as a part of regulated retail tariff.	The regulator approves tariffs upon distributor proposal. Tariffs are marginal cost-based and set for a period of 1 year.
Austria	Y	Tariff reviews are carried out by E-Control on behalf of the Energy Control Commission, using questionnaires and in situ audits. The following principles are applied to cost analysis: • The costs are calculated on a full average historic cost basis, taking finance costs into account. • When calculating the cost of the construction, expansion, maintenance and operation of an electricity network, only such expenses as are deemed reasonable in their origin and amount are taken into account. • Network costs for a given tariff determination period are largely derived from the balance sheet and income statement contained in the operator's annual financial statements. The sustainability of the expenses and income for the tariff determination period is examined, and they are normalized in exceptional cases, giving reasons. Normalization ensures that non-recurrent expenses and income are replaced by amounts corresponding to the long-term averages. • The cost base for the use of system charge is determined on a historic cost basis, meaning that increased valuations due to company disposals or reorganizations (e.g. goodwill) are eliminated. This prevents double counting of costs. • Finance costs are calculated on the basis of the weighted average cost of capital (WACC), i.e. the weighted rate of interest paid by system operators on the debt and equity capital employed. This is currently put at about 6% before tax	

Participants to the survey	Existence Of Distinct Distribution Tariffs	Description	Tariff Methodology Including The Role Of Distributor And Role Of Regulator)
Bulgaria	Y	Revenue cap regulation - SEWRC approves the annual revenue in for the TSO as well as the numerical value of the ROR for a one year regulatory period	
Greece	N (except Medium Voltage Distribution Network Tariffs proposed by RAE for 2002 and still valid).	Since legal unbundling of the operation of the distribution network has not yet been established and due to lack of the Distribution Network Code, there is neither a methodology nor a procedure for the approval of the distribution system charges. Such charges are assumed to be incorporated into the retail tariffs of PPC SA, which are approved by the Minister of Development, following the opinion of RAE. A set of charges for the use of the medium voltage distribution network were approved in April 2002 by the Minister of Development, following the opinion of RAE, to facilitate the opening of the market to eligible customers connected to this network. Due to the absence of adequate accounts unbundling, RAE performed the relevant calculations on the basis of best estimates. A new proposal has been submitted by RAE for the revision of the aforementioned charges, but this proposal has not been approved by the Minister of Development yet, so the previous charges still apply.	
Hungary	Y	Post stamp country uniform tariffs with basic charge and energy charge, varying according to voltage levels.	0,65- 27 €/MWh depending on voltage level
Italy	Y	The model used for transport tariffs (transmission, distribution and metering) in the first regulatory period, based on tariff options and constrains set ex-ante by the Authority, has been replicated in the second regulatory period for distribution only. Distribution tariff options covers the costs related to network distribution costs and commercial costs such as billing and customer care.	Distributors, for the time being, continue to provide the metering service but, in the next future, a complete liberalization of the service is possible. The Authority will continue to set a compulsory metering tariff only until the complete liberalization of the service. See Table 1. Transmission Tariffs Distribution tariff options for final non-residential customers: CONSTRAINT V1 Maximum total annual revenue which can be obtained by the distributor from a single customer category (verified ex-post). It is

Participants to the survey	Existence Of Distinct Distribution Tariffs	Description	Tariff Methodology Including The Role Of Distributor And Role Of Regulator)
			calculated on the basis of TV1 option. CONSTRAINT V2 Maximum price, related to a standard quality service, which determines the maximum expense for each customer (verified ex-ante). It is calculated on the basis of TV2 option. TARIFF OPTIONS TV1 and TV2: Distributors propose and the regulator approves tariffs options. Tariff options have to comply with constraints V1 and V2. **TV1= r1+r3*kWh** With: r1 components, expressed in Euro cent per connection point r3 components expressed in Euro cent/kWh **TV2=f(a1,a2,a3)** With: $\alpha1 = \rho1 (cot)*\delta1$ **(Euro cent per customer** $\alpha2 = [\rho1 (disMT)+ \rho1 (disBT)]* \delta2+$ $[\rho3 (disMT)+ \rho3 (disBT)+ \rho3 (cot)]* \delta4$ **(Euro cent per kW)** $\alpha3 = \rho3 (disAT)* \delta3$ **(Euro cent per kWh)**
UNMIK	N This is in process and the distribution tariff will be in place begin September 2006		Tariff Methodology will be ready October 2005
FYROM	Y	Average distribution will be used, not marginal costs	Three voltage levels will be used: • 35kV • 10(20), 6kV • 0,4kV Distribution tariffs will be the same for all

Participants to the survey	Existence Of Distinct Distribution Tariffs	Description	Tariff Methodology Including The Role Of Distributor And Role Of Regulator)
			territory of the Republic of Macedonia for the same voltage level. The distributor is obliged to publish the distribution grid code after the approval from the ERC, to provide secure and efficient operation of the distribution system The role of ERC is to pass a methodology for regulating electricity prices, the tariffs and to control prices during the regulated period. The first regulated period is set to 3 years duration. The methodology is incentive based with application of the hybrid method - revenue cap and price cap. The formula is the following: $MARt = [MARt\text{-}1 * (1 + CPIt) * (1 – X) - Kt] * a + (1 – a) * Pt - St - Zt$
Serbia	N	Tariff expected to be completed by July 2006	
Montenegro	N/A		
Romania	Y	The distribution tariff is differentiated on voltage level (three voltage levels: high voltage, medium voltage and low voltage). There are 8 distribution operators (DO) and for each DO is determined the individual set of tariffs, corresponding to voltage level. The distribution tariff is paid by the suppliers, for the energy supplied to the consumers.	It is a tariff basket – price-cap type regulation. Role of regulator: • issue specific methodologies • analyze distributor tariffs proposals • approve distribution tariffs Role of distributor: • send tariffs proposals to the regulator according to the specific methodology Periodicity: the regulatory periods are 5 years, with the exception of first regulatory period that will be 3 years. The distribution tariffs approved according to the present methodology will come into force at the beginning of each fiscal year
Slovenia	Y	Same as for transmission tariffs	The same methodology as for transmission

Participants to the survey	Existence Of Distinct Distribution Tariffs	Description	Tariff Methodology Including The Role Of Distributor And Role Of Regulator)
			tariffs
Turkey	Y	The provisions covering prices, terms and conditions related to distribution and related services. The distribution tariff prepared by the distribution licensees includes the use of distribution system prices.	The use of distribution system prices are calculated as per the provisions of the "Communiqué regarding the Regulation of Distribution System Operation Revenue".
			The parameters to be used in the calculations regarding the determination of revenue and/or price caps of the licensees subject to tariff regulation for one implementation period are determined through revenue control performed by the Authority.
			The following criteria are taken into consideration during revenue control:
			• Ensuring reliable, adequate, quality, uninterrupted, low-cost and environment-friendly electricity supply to consumers,
			• Establishment of non-discriminatory revenue control structure,
			• Ensuring that the parameters within the scope of revenue control reflect costs,
			• Increasing the service quality and efficiency with due regard to the security of transmission and distribution services
			• Ensuring the financial viability of legal entities with due regard to their efficiency levels,
			• Facilitation of efficient long-term investments,
			• Facilitation of effective competition,
			• Ensuring the pass-through of gains from increased efficiency and competition,
			• Ensuring that cross subsidies between activities are prevented.
			• The work towards determining the parameter values for revenue control to be in effect for an implementation period is

Participants to the survey	Existence Of Distinct Distribution Tariffs	Description	Tariff Methodology Including The Role Of Distributor And Role Of Regulator)
			commenced minimum twelve and maximum eighteen months before October 31 of the last year of the current implementation period. The parameters regarding the use of distribution system revenue cap are set to allow to recover the regulatory operating expenses, regulatory depreciation costs and a return on the regulated asset base calculated as per the provisions of the "Communiqué regarding Electricity Market Chart of Accounts, Regulated Items and Reporting", as well as the provisions of the applicable legislation, to the extend the efficiency, quality and loss-theft target levels applicable for the type of the activity are achieved.

Table 9: Distribution Tariffs

Participants to the survey	Average Values
Albania	N/A
Bosnia Herzegovina	Average tariff – total : 21,60 €/MWh Average tariff – power part : 17,69 €/MWh Average tariff – energy part : 3,91 €/MWh 35kV : 1,14 €/kW, 0,29 €/MWh 10kV: 2,28 €/kW,0,99 €/MWh 0,4kV - commercial with power metering: 5,71 €/kW,4,55 €/MWh 0,4kV - commercial without power metering: 1,21 €/kW,16,25 €/MWh 0,4kV – residential: 0,67 €/kW,16,25 €/MWh 0,4kV - public lightening: 0 €/kW, 30,95 €/MWh
Austria	Energy charge: From 3 to 42 €/MWh depending on voltage level Fixed monthly charge: from 1,2 to 4 €/kW
Bulgaria	Average value = 7.15 €/kW, SEWRC approves the tariffs for MV-20kV, 10kV, 6kV and LV-0,4kV There is no fixed monthly charge and the average energy component = 4,03 €/kW
Greece	No tariff or estimation by RAE exists for the Low Voltage Distribution Network. Supply to low voltage eligible customers is practically not possible, due to the absence of the Distribution Network Code and interval metering or other method for settlement of consumption by the DSO (PPC SA). The distribution tariff proposed by RAE for the Medium Voltage Distribution Network, which has been approved by the Minister of Development for year 2002 (applied so far throughout 2002 – 2005), consists of the following monthly charges applied on the consumer monthly maximum demand: For Consumers with monthly load factor > 48,6%: Demand charge: 2.529,22 €/MW – Energy Charge: 0 €/MWh For Consumers with monthly load factor < 48,6%: Demand charge: 910,52 €/MW – Energy Charge: 4,62592 €/MWh Therefore, for a typical medium voltage customer, i.e. subscribed demand 4 MW, annual consumption 24 GWh: Annual distribution network charges = € 116.300 (assuming that the subscribed demand is utilized fully for 11 months and 50% during the 12th month
Hungary	
Italy	Distribution tariff average value (excluding regulatory costs): Dc: 67.23 € /MWh Ib: 37.61 € /MWh Ig: 5.83 € /MWh
UNMIK	-
FYROM	€ 14.79/MWh average distribution fee

Participants to the survey	Average Values
Serbia	N/A
Montenegro	N/A
Romania	High voltage: between 2.62 and 5.8 €/MWh Medium voltage: between 6.3 and 10 €/MWh Low voltage: between 21.2 and 32.5 €/MWh There is neither a power component nor a fixed monthly charge. Prices will vary by zone and distribution company/entity. Was Calculated from the total revenue /quantities. Calculation of an average is difficult since the differentiation on capacity part and energy part is strong. Therefore we recommend for average calculations to compare the typical consumers instead. These averages are calculated on the basis of TSO and DSO revenue over Jan – July 2005. • Average tariff – power part 3, 9 €/MWh • Average tariff – energy part 15,2 €/MWh
Turkey	Average tariff – total 8.06 Euro/MWh Average tariff – power part N/A Average tariff – energy part N/A Distribution tariffs are not differentiated on voltage levels, but are differentiated on customer classes. All distribution tariffs, based on customer classes are charged as variable costs which mean that there is no separation in terms of fixed and energy charges. In distribution tariffs, no component is differentiated on time of use values.

Table 10: Distribution Tariffs (Continued)

Participants to the survey	Description	Tariff Methodology	Values
Albania	N/A		
Bosnia Herzegovina	There are three tariff groups: industrial, commercial and residential. Tariffs are also differentiated by seasons and time of the day.	During 2005 the tariff methodology was issued by the regulator. Tariffs are approved by the regulator upon distributor proposal for a period of 1 year. Tariffs are marginal cost-based. All customers are captive.	52,67 €/MWh
Austria	N	-	-
Bulgaria	There are two tariff groups, industrial and residential. Government and commercial consumers (mostly shops) may apply for either industrial or residential tariff.	Industrial tariffs are subject to time of use pricing	Average = 43.52 Industrial = 39.50 Residential = 50.77
Greece	According to the provisions of the Supply Code in force, all retail supply tariffs of a company which covers more than 70% of the energy supplied to Eligible customers are regulated.	In so far that PPC SA retains at least a 70% market share of the supply to eligible customers, all its supply tariffs to eligible customers are regulated and fixed by the Minister of Development after opinion by RAE. The approval of the supply tariffs is based on total cost-plus calculations. PPC provides evidence of annual growth of cost elements, as for example inflation rates and changes in energy fuel prices and then the decision takes the form of allowed percentage change of all tariff levels and parameters. The tariffs are defined per category of customer (e.g. industrial, commercial, domestic, etc.) and are not related to eligibility or not of the customer.	Currently, the average level of the (all inclusive) regulated PPC retail tariff ranges from 0.051 €/kWh for high and medium voltage industrial customers to 0.08 €/kWh for medium voltage commercial customers and 0.11 €/kWh for low voltage commercial customers. Since 2002 only increases due to inflation have been approved, amounting to around 8.85%.
Hungary	Residential: General tariff (A) with two blocks, separately measured controlled off-peak tariff (B), tariff for employees of the electric industry (C). Non-residential tariffs: tariffs with capacity charge and with	"Cost plus" type price regulation started on 1/2/2005. Cost & asset review in 2004, the length of the price regulation period is not defined. The system's future depends on the model's evolution. Present situation:	2004: 84,653 €/MWh 2005: 92,939 €/MWh

Participants to the survey	Description	Tariff Methodology	Values
	standing charge, three voltage levels. Public lighting tariff.	yearly price maintenance, The regulator makes each year price proposal to the minister of economy and transport. This latter is the price setting authority.	
Italy	The Single Buyer (SB) began operating in January 2004. The SB is the company assigned by law to act as guarantor of supply to customers on the captive market, a function previously carried out by incumbent Enel. The SB is wholly controlled by GRTN. There is a set of regulated tariffs system for residential consumers: D1, D2 and D3.		
UNMIK	Tariffs Structure is shown on ERO website www.ero-ks.org		Average annual price – total €/MWh 52.10 €/MWh -2004 51.58 €/MWh -2005
FYROM	Retail tariffs depend on which voltage level consumers are connected, season when the electricity is delivered and time period during the day when electricity is delivered. Categories: High voltage 1. 110kV 2. 35 kV 3. 10(20)kV Low voltage 4. 0.4 kV a) residential b) other consumers - I tariff degree (power is measured) - II tariff degree (power is not measured) c) public lighting Participation of power in the total electricity value amounts to: • for high voltage, 50%, • for low voltage, 25% With high voltage consumers and the consumer category, other	Retail tariffs set the ERC of Macedonia for tariff (captive) consumers accordant with Rulebook for regulating electricity prices. Retail tariffs cover the costs for generation, transmission and distribution The retail function is carried out by the MEPSO for the consumers which are connect to transmission system and by the distribution company. The first regulated period is set to 3 years duration.	39,56 €/MWh - 2004

Participants to the survey	Description	Tariff Methodology	Values
	consumers, I tariff degree, power is determined with power measuring devices and depends on the specific characteristics of each consumer, whereas with the consumer category households and other consumption, II tariff system, power is calculated in the way that the value of consumed active electricity in kWh is increased for 33%. Tariff headings according to the season when electricity is delivered: • High season headings (January, February, March, October, November, December) • Low season headings (April, May, June, July, August, September) Tariff headings according to the time period during the day: High time headings • from 07.00 to 13.00 and from 16.00 to 22.00, winter time • from 08.00 to 14.00 and from 17.00 to 23.00 summer time Lower time headings • from 13.00 to 16.00 and from 22.00 to 07.00 winter time • from 14.00 to 17.00 and from 23.00 to 08.00 summer time • on Sundays from 00.00 to 24.00 provided the consumer has enabled such measurement (two-tariff).		
Montenegro	N/A		
Romania	The retail tariffs are uniform tariffs throughout the country The retail tariffs are established for two main types of consumers: • tariffs for residential consumers • tariffs for industrial consumers For the residential consumer there are seven types of tariffs (monomial, monomial with reservation, monomial with reservation differentiated by hour intervals), each type having differentiated values depending on the voltage level (Low and medium voltage. For the industrial consumer there are seven types of tariffs (monomial, monomial differentiated by hour intervals, binomial,	When calculating the tariffs, the justified costs of generation, transmission, distribution and supply of electricity, the development and environment protection costs, as well as a reasonable profit share shall be taken into consideration. End - user price = Generation price + Transmission Tariff (revenue cap) + Distribution Tariff (price cap) + System Services (cost plus) + Supply Service (profit margin). Role of regulator: - issue specific methodologies - analyze tariffs proposals - approve retail tariffs	67 €/MWh

Participants to the survey	Description	Tariff Methodology	Values
	binomial differentiated by hour intervals), each type having differentiated values, depending on the voltage level (Low, medium and high voltage).	Periodicity: annually	
Slovenia	The overall tariff exists only for households. Since July 2004, the industrial customers are eligible and not regulated any more.	N/A	N/A
Turkey	The retail tariff prepared by retail licensees for sale of electricity and/or capacity to non-eligible users includes retail prices and retail service prices as well as the principles and procedures applicable to the implementation of the tariff. The consumers, the consumption levels of which exceed the limits required for being an eligible consumer and that does not exercise their right to choose their own suppliers, can continue to be supplied electricity and/or capacity under the retail tariff that its retail licensee applies to non-eligible consumers.	The parameters to be used in the calculations regarding the determination of revenue and/or price caps of the licensees subject to tariff regulation for one implementation period are determined through revenue control performed by the Authority. The parameters regarding the retail prices are set with due regard to the price cap regarding energy purchase, loss-theft target levels and gross profit margin and to allow to recover retail service costs calculated as per the provisions of the "Communiqué regarding Electricity Market Chart of Accounts, Regulated Items and Reporting" as well as the provisions of the applicable legislation, to the extend efficiency targets are achieved. The revenue control can not take any non-tariff and/or below-tariff practices and any form of cross-subsidy into account. The expenditures that will not be included as cost items in any form during the revenue control and/or that will be allowed to a certain extent determined by the Board are subject to the provisions of the "Communiqué regarding Electricity Market Chart of Accounts, Regulated Items and Reporting" as well as the provisions of the applicable legislation. At the end of the revenue control process, a Board decision is issued regarding the parameters and the implementation period. Such parameters are inserted in the licenses of the licensees subject to tariff regulation. Such modification is deemed as a "license modification due to changes in the applicable legislation" as per the provisions of the "Electricity Market Licensing Regulation". The examination and evaluation of the tariff proposals is completed by the Authority before December 31 of the	

Participants to the survey	Description	Tariff Methodology	Values
		current year. Any information and document required during the examination and evaluation of the tariff proposals may be requested from the licensees and the legal entities may be invited for interviews. If the tariff proposal is deemed appropriate, the tariffs proposals are approved. The tariffs approved become effective for the tariff period between January 1 and December 31 of the following year. The licensees subject to tariff regulation are obligated to announce their approved tariffs through publishing them in the press.	
Serbia	There are five categories of consumption. The first three categories are created on a voltage level basis, there are *High*, *Medium* and *Low voltage* category. The fourth category is *Wide consumption*, and the fifth is *Public lighting*. There are different tariff elements depending on the category in question. In general there are: o Metered power, expressed in CSD/kW, o Active energy (CSD/kWh), and o Reactive power (CSD/kVArh) (metered and charged only to HV, MV, and LV category. • Fixed charge (for wide consumption category)	Existing tariff system has been created by EPS, and approved by the Government. From July 2006 creation of tariff methodology and tariff system will be performed by Energy Agency of Republic of Serbia. It is applied to all customers. There are no eligible customers at the moment, but they exist according to the Energy Law. Eligible customers cannot enjoy the benefit of regulated tariffs. According to the Energy Law after the fixed period of 12 months every consumer can change the tariff customer status into the eligible customer status, and vice versa.	Average annual price 33.94 €/MWh

Table 11: Regulated Retail Tariffs

Participants to the survey	Values For Industrial Consumers		Values For Commercial Consumers
Albania	N/A		

Bosnia Herzegovina	Average annual price – total : 40,67 €/MWh
	
	110kV - 3,39 €/kW per month
	     24,96 €/MWh
	  35kV - 3,14 €/kW per month
	     25,26 €/MWh
	
	  10kV - 3,86 €/kW per month
	     26,00 €/MWh
	0,4kV - 6,76 €/kW per month
	     29,64 €/MWh
	ADR/ANR = 2
	Values valid as per 17 April 2006. Values per category, according to EUROSTAT methodology
			Only if different rates than those applied for industrial consumers are applied for commercial use (usually shops)
			Average annual price – total: 84,45 €/MWh
			
			• Monthly fixed charges –charges vary by usage category (C1, C2, etc.)
			
			C_1 8,64 €/customer
			C_2 12,09 €/customer
			
			• Average annual price – fixed part : 12,12 €/MWh
			• Average annual price – energy part: 72,33 €/MWh
			
			Values valid as per 17 April 2006.

	-with taxes: Ia = 11,47 Ib = 11,43 Ic = 8,90 Id = 5,33 Ie = 4,44 If = 4,44 Ig = 3,54 Ih = 3,45 Ii = 3,14	-taxes excluded: Ia = 10,43 Ib = 10,39 Ic = 8,09 Id = 4,85 Ie = 4,04 If = 4,04 Ig = 3,22 Ih = 3,14 Ii = 2,86	
Austria			
Bulgaria	Average = 43.52 Industrial = 39.50 Residential = 50.77		

Participants to the survey	Values For Industrial Consumers	Values For Commercial Consumers
Greece	PPC Average Annual Revenue from sales to industrial consumers (all voltages): 51 €/MWh.	80 €/MWh (for medium voltage commercial customers) 110 €/MWh (for low voltage commercial customers) PPC Average Annual Revenue from sales to commercial consumers (medium and low voltage): 100 €/MWh.
Hungary	Average annual price – total 80,857 €/MWh Tariffs with standing charge 103,87 €/MWh Monthly fixed charge 147 522 000 €/year Average annual price – energy part 72,48 €/MWh Tariffs with capacity charge 68,32 €/MWh Average annual price – power (capacity) part 22,45 €/MWh Average annual price – energy part 45,87 €/MWh Peak: 57,36 €/MWh Off peak: 38,28 €/MWh (Average energy charges only. No standing charge or capacity charge included.)	
Italy	<table><tr><td>Standard customer (Eurostat definition)</td><td>Ib</td><td>Ig</td></tr><tr><td>Wholesale price of electricity or cost of generation</td><td>76.51</td><td>69.49</td></tr><tr><td>Transmission tariff (excluding regulatory costs)</td><td>3.50</td><td>3.27</td></tr><tr><td>Distribution tariff (excluding regulatory costs)</td><td>37.61</td><td>5.83</td></tr><tr><td>Estimated energy sales marketing margin</td><td>1.23</td><td>0.003</td></tr><tr><td>Grid losses</td><td>4.09</td><td>3.71</td></tr><tr><td>Regulatory costs</td><td>9.22</td><td>8.4</td></tr><tr><td>TOTAL (€/MWh)</td><td>132.16</td><td>90.97</td></tr></table>	
UNMIK	Average annual price – total €/MWh 110kV- 35.03 €/MWh 35 kV- 46.86 €/MWh 10 kV- 55.52 €/MWh Monthly fixed charge No Average annual price – power part €/MWh Average annual price – energy part €/MWh Values valid as per year 2004. Power or energy switch points Values per category, according to EUROSTAT methodology in	Average annual price – total €/MWh Monthly fixed charges – note if fixed charges vary by usage category (C1, C2, etc.) Average annual price – fix part Average annual price – energy part C1 (0.4 kV I) 58.28 €/MWh year 2004 57.23 €/MWh (I-VI) 2005 C2 (0.4 kV II)

Participants to the survey	Values For Industrial Consumers	Values For Commercial Consumers

	annex.
	Values valid as per 1 July 2005.
	110kV- 36.8 €/MWh
	35 kV- 45.49 €/MWh
	10 kV- 53.35 €/MWh
		85.65 €/MWh –year 2004
		84.43 €/MWh (I-VI) 2005
		For time of use tariffs:
		Average day rate / average night rate €
		   C1 C2
		HT 45.29 71.89
		LT 22.66 50.05
		Values valid as per year 2004. Value and %
		Values valid as per 1 July 2005. €/MWh
		   C1 C2
		HT 45.29 72.85
		LT 22.66 48.48

FYROM	Categories 110kv, 35kV, 10kV Average annual price – total 31,49€/MWh Monthly fixed charge No fixed charge Average annual price – power part 10,03 €/MWh Average annual price – energy part 20.90€/MWh Note different tariff categories, if applicable For time of use tariffs: Average day rate / average night rate 48.15 Euro/MWh day rate 12.62 Euro/MWh night rate Values valid as per year 2004.	I tariff and II tariff degree Average annual price – total 77€/MWh Monthly fixed charge No fixed charge Average annual price – power part 21.24 €/MWh Average annual price – energy part 55.76€/MWh Note different tariff categories, if applicable For time of use tariffs: Average day rate / average night rate 81.05 Euro/MWh day rate 16.47 Euro/MWh night rate Values valid as per year 2004.
Montenegro	N/A	
Romania	Average annual price – total 66,4 €/MWh Monthly fixed charge No Average annual price – fix part 11,1 €/MWh Average annual price – energy part 55,3 €/MWh Note different tariff categories, if applicable Values per category, according to EUROSTAT methodology Ia = 9.99 €/MWh Ib = 16.49 €/MWh	The tariffs for commercial consumers are the same as those applied to industrial consumers.

Participants to the survey	Values For Industrial Consumers	Values For Commercial Consumers
	Ic = 14.82 €/MWh Id = 13.55 €/MWh Ie = 8.65 €/MWh If = 8.65 €/MWh Ig = 7.54 €/MWh Ih = 7.97 €/MWh Ii = 7.07 €/MWh Values valid as per 1 July 2005, values are tax excluded.	
Slovenia	N/A	N/A
Turkey	Average annual price – total 50.9 Euro/MWh Average annual price – power part 3,188.8 Euro/MW only for double term industrial users For time of use tariffs: 78.2 Euro/MWh (for the hours between 17:00 – 22:00) 153.6 % 29.7 Euro/MWh (for the hours between 22:00 – 06:00) 58.4 % 44.7 Euro/MWh (for the hours between 06:00 – 17:00) 87.9 %	Average annual price – total 65.1 Euro/MWh There is no fixed charge for commercial users. No fix part for commercial users, commercial users are not allowed to buy energy on with separate charges for the power and energy parts. 110.8 Euro/MWh (for the hours between 17:00 – 22:00) 170.2 % 31.3 Euro/MWh (for the hours between 22:00 – 06:00) 48.0 % 61.9 Euro/MWh (for the hours between 06:00 – 17:00) 95.0 %
Serbia	• Average annual price – total 27.09€/MWh • Monthly fixed charge • Average annual price – power part 9.83 €/MWh • Average annual price – energy part 16.25 €/MWh Day: 31,01 €/MWh 114,47% DV=(IDE+2/3IP+IRE*DE/TE)/TE DV-Day value IDE-Income from daily energy IP-Income of power IRE-Income of reactive energy DE-Daily energy TE-Total 24hrs Energy Night: 18,38 €/MWh 67,85% NV=(INE+1/3IP+IRE*NE/TE)/TE NV-Night value INE-Income from night energy IP-Income of power	Average annual price – total 45.09 €/MWh Monthly fixed charges – note if fixed charges vary by usage category (C1, C2, etc.) 1,66 € Average annual price – fix part 10.61 €/MWh Average annual price – energy part 35.58 €/MWh There are three groups of consumers: - with power measurement: Average annual price-total 38,94 €/MWh Average annual price-fix part 16,60 €/MWh Average annual price-en. part 18,93 €/MWh Daily value 42,36 €/MWh (108,78%) Night value 30,45 €/MWh (78,20%) (Daily and Night value are calculated as in 4.4.) - without power measurement (total): Average annual price-total 52,76 €/MWh Monthly fixed charges 1.76 €/Month Average annual price-fix part 3,15 €/MWh

Participants to the survey	Values For Industrial Consumers	Values For Commercial Consumers
	IRE-Income of reactive energy NE-Night energy TE-Total 24hrs Energy	Average annual price-en. part 49,60 €/MWh - without power measurement with one tariff for energy: Average annual price-en. part 51,38 €/MWh - without power measurement with two tariffs: Average annual price-en. part 46,15 €/MWh Daily value 59,22 €/MWh (128,32%) (included only the income from Daily energy, does not include fix part) Night value 15,49 €/MWh (33,56%) (included only the income from Night energy, does not include fix part)

Table 12: Regulated Retail Tariffs (Continued)

Participants to the survey	Values For Residential Consumers	Values For Government Consumers	Special Tariffs (Used For Social Reasons)	Collection Rate In 2004	Trend In Collections
Albania	N/A				
Bosnia Herzegovina	Average annual price – total : 52,20 €/MWh • Monthly fixed charges –charges vary by usage category (R1, R2, etc.) R_1 2,10 €/customer R_2 3,32 €/customer Average annual price – fixed part : 7,13 €/MWh Average annual price – energy part : 45,07 €/MWh Values valid as per 17 April 2006. <table><tr><td>-with taxes: Da = 8,24 Db = 6,74 Dc = 6,37 Dd = 6,09 De = 4,64</td><td>-taxes excluded: Da = 7,04 Db = 5,76 Dc = 5,44 Dd = 5,20 De = 3,97</td></tr></table>	Average annual price: Public lightening 79.6 €/MWh		Industrial consumers 85% Commercial consumers 98% Domestic consumers 96% Government consumers (Public lightening) 99%	Each category collection rate is increasing.
Austria					
Bulgaria	Average = 43.52 (*52.24*) Industrial = 39.50 (*47.40*) Residential = 50.77 (*60.92*) All prices + 20% VAT (*ital*)	May be industrial or residential rate	Use below 75 kWh/month is priced at 60 €/MWh		
Greece	80 €/MWh (for medium voltage commercial customers) 110 €/MWh (for low voltage commercial customers) PPC Average Annual Revenue from sales to commercial consumers (medium and low voltage): 100 €/MWh.	No differentiation is applied for government facilities	A discount tariff is granted to families with more than three children, as a measure of social support. There are also special discount tariff regimes for consumers in the agricultural sector and for the employees of	N/A	N/A

Participants to the survey	Values For Residential Consumers	Values For Government Consumers	Special Tariffs (Used For Social Reasons)	Collection Rate In 2004	Trend In Collections
	PPC Average Annual Revenue from sales to domestic consumers (low voltage): 80 €/MWh Da = 79.5€/MWh Db = 74.70€/MWh Dc = 63.7€/MWh Dd = 72.2€/MWh De = 55.0€/MWh Values valid as per 1 July 2005		PPC.		
Hungary	Average annual price – total 90,163 €/MWh The residential tariffs are of pure energy charge character. The "A" and "C" tariffs are applicable 24 hours a day. The "B" tariff consumption, though separately measured and is applicable during off-peak hours does not represent the whole off peak consumption.	Only if different rates than those applied for industrial consumers are applied for Government facilities	Presently no social tariff is introduced. Concerning the general tariff ("A"), the first 1320 kWh/year is 4,3 % cheaper than the above 1320 kWh consumption	Cca 98-99 %. There is no regular data collection.	N/A
Italy	159.43 Euro/MWh				

UNMIK	-Average annual price – total
	-Monthly fixed charges – note if fixed charges vary by usage category (R1, R2, etc.)
	-Average annual price – fix part
	R1 < 800 kWh/month:
	   41.44 €/MWh
	R2 > 800 kWh/month:
	   60.68 €/MWh
	- Average annual price – energy part
	45.58 €/MWh -year 2004
	45.79 €/MWh -1July 2005
	For time of use tariffs:
	Average day rate / average night rate
	Values valid as per year 2004. Value and %
	Values per category, according to EUROSTAT methodology in annex.				

Participants to the survey	Values For Residential Consumers	Values For Government Consumers	Special Tariffs (Used For Social Reasons)	Collection Rate In 2004	Trend In Collections

	R1 < 800kWh/month:
	  45.19 €/MWh
	R2 > 800 kWh/month:
	  65.22 €/MWh
	Values valid as per 1 July 2005				

FYROM	Average annual price – total 37.28€/MWh Monthly fixed charges No Average annual price – fix part 9.31€/MWh Average annual price – energy part 27.96€/MWh Average day rate / average night rate 34.31 €/MWh day rate 19.57 €/MWh night rate	Average annual price – total 77€/MWh Monthly fixed charges No Average annual price – fix part 21.24€/MWh Average annual price – energy part 55.76€/MWh Average day rate / average night rate 81.05 €/MWh day rate 16.47 €/MWh night rate	N	Industrial consumers: 73.25%(data only for 110kV) Commercial consumers, 35kV, 10kV, gov.cons 84.84% Domestic consumers 82.19%	Trends in collections are positive, that's mean that every year the percent of collection rate is bigger than previous year for period 2001-2004.
Montenegro	N/A				
Romania	Average annual price – total 68.9 €/MWh Monthly fixed charge Average annual price – fix part No Average annual price – energy part 57.2€/MWh For time of use tariffs: Average day rate / average night rate Values valid as per year 2004. Values per category, according to EUROSTAT methodology. Da = 3.5€/MWh Db = 7.220€/MWh Dc = 6.61€/MWh	The tariffs for Government consumers are the same with those applied for industrial consumers.	Only the low income residential consumers are eligible for social tariffs. The social tariff is applied only for a small amount of electricity (60 kWh monthly), the next 30 kWh (monthly) is paid to the normal tariff and all the energy exceeding these amounts is paid to an increased value Average annual price social tariffs 41,7 €/MWh		

Participants to the survey	Values For Residential Consumers	Values For Government Consumers	Special Tariffs (Used For Social Reasons)	Collection Rate In 2004	Trend In Collections
	Dd = 6.44€/MWh De = 5.01€/MWh Values valid as per 1 July 2005				
Slovenia	Average annual price – total -Monthly fixed charges – note if fixed charges vary by usage category (R1, R2, etc.) Tariff system for residential customers is very diversified: capacity term depends on the fuse, energy term is subdivided into daily hours (day/night), and no additional fixed charges exist. -Average annual price – fix part 47,5 €/MWh -Average annual price – energy part For time of use tariffs: Average day rate / average night rate / single rate Values valid as per year 2004. Values per category, according to EUROSTAT methodology in annex. Values valid as per 1 July 2005. 3.738 GWh annual consumption for all households in Slovenia, out of which 36,9% / 33,7% / 29,4%	Only if different rates than those applied for industrial consumers are applied for Government facilities -Average annual price – total The tariffs for Government consumers do not exist -Monthly fixed charges – note if fixed charges vary by usage category (G1, G2, etc.) -Average annual price – fix part -Average annual price – energy part For time of use tariffs: Average day rate / average night rate Values valid as per year 2004.	The special tariffs for social reasons do not exist	-Industrial consumers estimated around 95% -Commercial consumers estimated around 95% -Domestic consumers estimated around 97%	Slightly improving.
Turkey	Average annual price – total 53.4 Euro/MWh There is no fixed charge for residential customers. No fix part of the tariff for residential users, residential users are not allowed to buy energy on double term which separates charges as power and energy part. 81.9 Euro/MWh (for the hours between 17:00 – 22:00) 153.4 %	Same as for commercial users	Charities, Associations, Foundations, Museums, Public Schools, State-owned Dormitories, Public Universities, Public Vocational Schools, Public Training Courses, State-owned Medical Institutions, Public Sports Facilities, Fish Farms and	No collection rate records are kept on customer group basis, but the average collection rate for Turkey in 2004 was 91 %.	2000: 90 % 2004: 91 %

Participants to the survey	Values For Residential Consumers	Values For Government Consumers	Special Tariffs (Used For Social Reasons)	Collection Rate In 2004	Trend In Collections
	31.3 Euro/MWh (for the hours between 22:00 – 06:00) 58.5 % 50.8 Euro/MWh (for the hours between 06:00 – 17:00) 95.0 %		Poultry Farms: 49.3 Euro/MWh Martyr Families and war veterans: 31.6 Euro/MWh In March 2001 Turkey enacted a new Electricity Market Law, the Law n° 4628, which represented a major step towards deregulation and opening up of the electricity market in order to assure its compatibility with the EC Internal Electricity Market Directive. The Law fulfils the requirements of keeping separate accounts for activity, which is a minimum necessary to avoid cross-subsidization and distortion of competition. Therefore it envisages "cost reflected price mechanism" for the calculation of tariffs regarding different customers group and geographical regions. This law also includes provisions that could be used by the government to guarantee the universal service. In this regard, the Law stipulates that consumers located in certain regions and/or in line with certain objectives need to be supported, may be subsidized through direct cash refunds.		

Participants to the survey	Values For Residential Consumers	Values For Government Consumers	Special Tariffs (Used For Social Reasons)	Collection Rate In 2004	Trend In Collections
Serbia	Average annual price – total 35.64 €/MWh Monthly fixed charges – note if fixed charges vary by usage category (R1, R2, etc.) 1.76 € Average annual price – fix part 4.45 €/MWh Average annual price – energy part 31.19 €/MWh For time of use tariffs: There are two groups of consumers: - with one tariff for energy: Average annual price-en. part 35,38 €/MWh - with two tariffs: Average annual price-en. part 29,44 €/MWh Daily value 42,42 €/MWh (144,09%) (included only the income from Daily energy; does not include fix part) Night value 10,86 €/MWh (36,89%) (included only the income from Night energy, does not include fix part)	N.A.	There are no social tariffs, but the consumers groups which have discount are defined. Two groups of low income consumers are defined: first group gets 30% discount for 450 kWh per month (Customers using financial/welfare support); second group gets 30% discount for 300 kWh per month (Pensioners with lowest pensions, handicapped on care, Foster families, Families that receive financial support for the third and fourth child). These groups are defined within the centers for social needs.	- Industrial and Commercial Consumers: 2002: 82,31% 2003: 83,97% 2004: 84,21% 2005: 86,59% - Domestic Consumers: 2002: 87,83% 2003: 90,37% 2004: 93,56% 2005: 93,01%	

Table 13: Regulated Retail Tariffs (Continued)

Participants to the survey	Average Price On The Competitive Retail Market	Retail Market Opening Share
Albania	N/A	
Bosnia Herzegovina		0% of total final consumption
Austria	Since the Austrian electricity market is 100% open, all customers, independent of the volume of consumption, can choose electricity at the market price. 3.56-3.87/MWh for small customers Note: 1.Prices applied to eligible consumers on the competitive market. 2.No appropriate average price can be given, so we calculated an approximate "average " but not necessarily representative price from the IG, Ib and Dc Eurostat Categories which amount to 3.36; 3.87; and 3.87 EUR /MWh respectively for small customers.	100% of total final consumption
Bulgaria	Not yet implemented	25% planned
Greece	Since in 2004 PPC had a retail market share of approx. 98%, retail tariffs to the vast majority of eligible customers coincide with PPC tariffs that are regulated by RAE. Retail tariffs offered to eligible customers by other suppliers are very simple in structure, as they contain only an energy charge. In all cases of eligible customers that switched supplier, part of their electricity demand is still being supplied by PPC, through the regulated tariffs	According to the provisions of the Law 3175/2003, which amended the previous Law 2773/1999, as of 1 July 2004, all non-household consumers of the interconnected system have become eligible, which accounts for almost 70% of annual electricity currently consumed in the country. Despite of this increased eligibility, in 2004 the percentage of customers having changed their supplier amounts to 2% by volume. However, the Greek Government has filed with the European Commission a request for derogation in accordance to Article 26 of the Directive 2003/54/EC for the micro-systems on all non-interconnected islands (Crete and Rhodes not included). According to the request, there will be no eligible customers on these islands and the exclusive supplier and generator (with the exemption of RES, CHP and self producers) will be the incumbent PPC SA.
Hungary	37,808 €/MWh	28,44 %
Italy	N/A	Since 1 July 2004 all non-household consumers have been free to choose their own supplier, about 80% of national consumption net of auto-consumption. With effect from July 2007, as an effect of the European legislation the opening of the market in the sales sector will also apply to household customers.
UNMIK	-	-

Participants to the survey	Average Price On The Competitive Retail Market	Retail Market Opening Share
FYROM		20% target
Montenegro		
Romania	40,3 €/MWh	33 %
Slovenia	44,9 €/MWh	77%
Turkey		
Serbia	N/A	

Table 14: Competitive Retail Prices 1 July 2005

Participants to the survey	Hydro Power Plants	Coal Fired Power Plants	Oil Fired Power Plants	Gas Fired Power Plants	Nuclear Power Plants
Albania	N/A	N/A	N/A	N/A	N/A
Bosnia Herzegovina	22,12 €/MWh	41,35 €/MWh	-	-	-
Austria	N/A	N/A	N/A	N/A	N/A
Greece	N/A	N/A	N/A	N/A	N/A
Bulgaria	40.90	30.85	N/A	N/a	20.66
Hungary	Unit less than 5 MW: 79,59 €/MWh Unit above 5 MW: 49,39 €/MWh Authority controlled prices to support renewables	From 1/1/2004 there are no authority controlled prices. Prices are set in the PPAs.	From 1/1/2004 there are no authority controlled prices. Prices are set in the PPAs	From 1/1/2004 there are no authority controlled prices. Prices are set in the PPAs	33-37 €/MWh
Italy	N/A	N/A	N/A	N/A	N/A
UNMIK	20 €/MWh	30 €/MWh	N/A	N/A	N/A
FYROM	21.24 €/MWh	21.24 €/MWh	N/A	N/A	N/A
Montenegro					
Romania	23 €/MWh	46.7 €/MWh	46.7 €/MWh	46.7 €/MWh	28.3 €/MWh
Slovenia	Zero	Zero	Zero	Zero	Zero
Turkey	40.7 €/MWh	42.2 €/MWh	-	42.7 €/MWh	-
Serbia	N/A	N/A	N/A	N/A	N/A

Note that for some participants to the survey, including Romania, Turkey and Bosnia and Herzegovina, the prices for different types of power plants represent calculated averages across plants, rather than engineering or marginal cost estimates.

Table 15: Generation Prices (Costs) As For 1 July 2005 (Considered In the Regulated Retail Tariffs)

Council of
European
Energy
Regulators

Ref: C06-SEE-15-04
Tariffs Benchmarking Report

Participants to the survey	Vat	Other Taxes In Force	Subsidies (2004)	Average Income Per Family (2000 And 2005)	Average Residential Consumption (2000 And 2005)
Albania					
Bosnia Herzegovina	The VAT rate will be 17% and it will be applied as of January 1, 2006	Sales tax (until January 1,2006) 10% - commercial and residential 0% - industrial	N/A	190 € / month 270 € / month	3600 kWh/year 4200 kWh/year
Austria	20%	1. Electricity Tax (1,5 Cent/kWh) 2.Contribution for Stranded Costs 0,007 – 0,0920 cts/kWh 3.Surcharge to the grid tariff ECO and CHP power plants 0.13cts/kWH 4. Tax for use of public properties 0,1 - 0,5 Cent/kWh	No	N/A	In 2003 : 3800 kWh/year
Bulgaria	20%				2180 kWh/year
Greece		Levy for RES Renewables and small CHP are promoted by preferential feed-in tariffs introduced by Law 2244/1994 as amended by the provisions of Law 2773/1999. According to Law 2773/1999 HTSO and the DSO recover in full the amounts paid to the RES and small CHP generators, through a specific account managed by HTSO. The revenues of this specific account are partly covered by a specific levy (RES levy) paid by each Customer, auto producers included. Since 1.11.04 the amount of RES levy is 0,0008 €/kWh for all categories of customers, and the annual maximum payment per consumption node is 600.000€ (increased annually by CPI-index).	No	In 2000: 23.000 Euro / year (source EUROSTAT) In 2005: 26.000 Euro / year (Estimation by RAE)	In 2000 : 3800 kWh / year per family (Source EUROSTAT) In 2005: 4900 kWh / year per family (Estimation by RAE)

Participants to the survey	Vat	Other Taxes In Force	Subsidies (2004)	Average Income Per Family (2000 And 2005)	Average Residential Consumption (2000 And 2005)
Hungary	25%	Energy tax: Introduced on 1/1/2004, residential customers are not subject to it. The energy tax is also subject to the 25 % VAT Values: 186 HUF/MWh (0,759 €/MWh)	No Write-offs of various consumer uncollectibles: cca 1-2% of total costs	2000: cca 110.000 HUF / month 2005: cca 185.000 HUF/month 1 € = 245 HUF rate	2000: 10 051 GWh 2005 Jan-June: 5 601 GWh
UNMIK	15%	Public Broadcast 3.5 € /month		174 €/month	5 390 kWh/year (2004)
FYROM	18%	N	Only subsidies for some industrial consumers and kind of subsidies as defined in the agreements between Government and companies in the process of privatization 23-35%	232.69 €/month in 2000 265 €/month in 2005	2000: 2653 GWh 2005: 2987 GWh
Montenegro	N/A				
Romania	19%	Excises 0.14€/MWh for commercial purposes 0.3 €/MWh for non-commercial purposes	No cross-class subsidies	N/A	1000 kWh/year
Slovenia	20% on value of invoice	No other taxes. Other levies: • Supplement for the priority dispatching: (3,3 € / MWh) • Supplement for the Energy Agency of Republic of Slovenia (0,158 € / MWh) • Supplement for the Borzen (electricity market operator) (0,125 € / MWh)	No	2002: 1.227 € / month 2005 not yet available	2004: 3.732

Participants to the survey	Vat	Other Taxes In Force	Subsidies (2004)	Average Income Per Family (2000 And 2005)	Average Residential Consumption (2000 And 2005)
Turkey	18%	Beside the value added tax (%18), municipality tax is charged as 1% to industrial customers and 5% to residential customers. Another non-sector levy is "energy fund" which is collected as 1% from all customer groups.	No	Total monthly average salary in 2000: 420.9 Euro Total monthly average salary in 2005: 1288.9 Euro	-
Serbia	18%		- a 5% discount for consumers who pay their obligations on time (7.988.343 EUR) - a 30% discount for consumption up to 450 kWh per month and for engaged power for users of material rights (1.459.077 EUR)	II quarter 2005 – 278 € / month	2001: 4.825 2002: 4.740 2003: 4.850 2004: 4.715

Note: Turkey's wholesale prices (or costs) as of 15 June 2005 = 52,3 €/MWh

Table 16: Other Issues

Annex 3: PJM Interconnect

The PJM interconnect operates in all or part of 12 states plus the District of Columbia. PJM was founded in the 1960s and was greatly expanded in the early part of this decade. This regional transmission organization (RTO) is the largest wholesale electricity market in the world.

PJM Interconnection plays a vital role in the U.S. electric system. As a RTO, PJM:
- Coordinates the movement of electricity through all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia and the District of Columbia
- Ensures the reliability of North America's largest centrally dispatched control area
- Operates the largest competitive wholesale electricity market in the world
- Plans generation and transmission expansion to ensure reliability
- Operates independently and neutrally
- Provides real-time information to its members/customers to support their decision-making

The scope of PJM's operations is extensive (all numbers are approximate):
- Population - 51 million
- Generating sources - 1,082, with diverse fuel types
- Generating capacity - 163,806 megawatts
- Peak demand - 131,330 megawatts
- Annual energy delivery - 700 million megawatt-hours
- Transmission lines - 56,070 miles
- Members/customers - more than 350
- Cumulative billing - $28 billion since 1997

The following map shows the operating areas of the PJM interconnect.
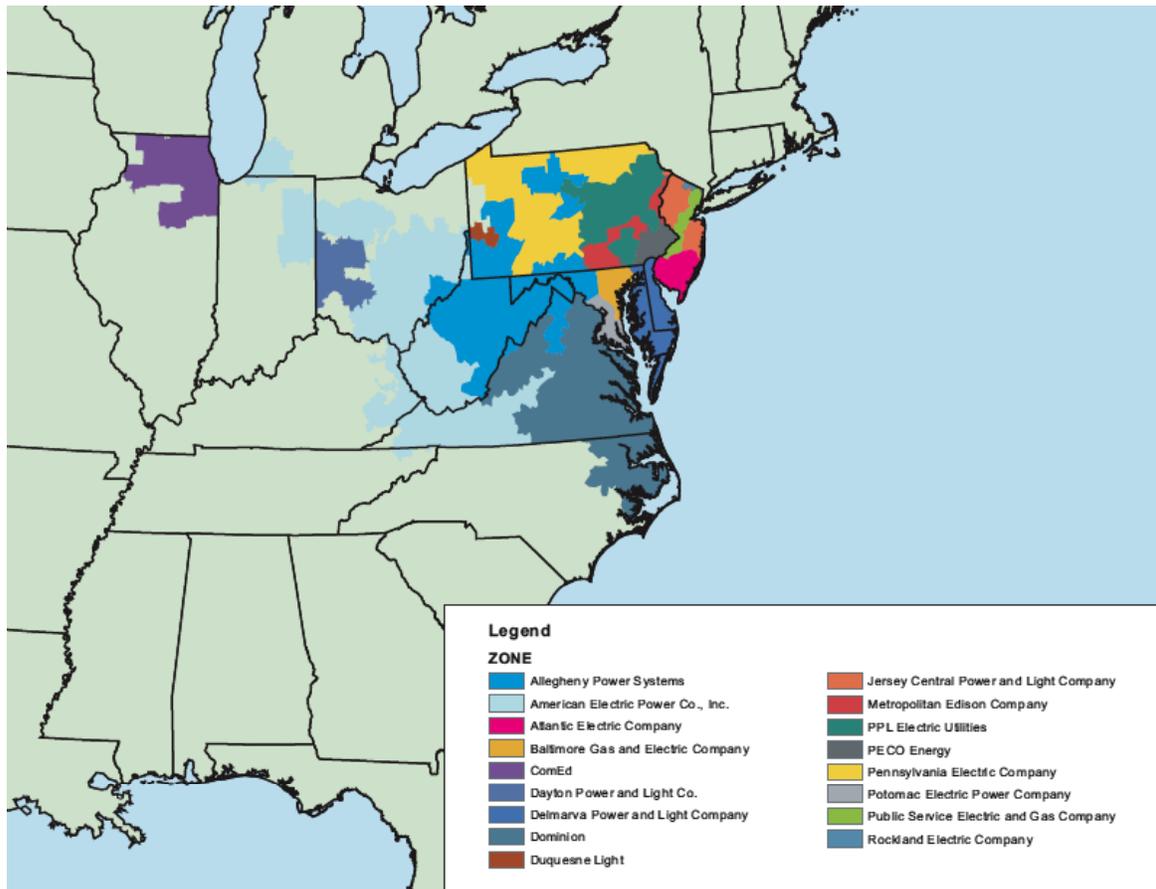
PJM Market Products

The PJM RTO lists locational marginal prices hourly for more than 1000 locations in its interconnected system. In addition to the LMPs, the following products are priced for PJM members:

- Scheduling, Control and Dispatch
- Reactive Supply and Voltage Control from Generation Sources Service
- Regulation and Frequency Response Service
- Energy Imbalance Service
- Operating Reserve - Spinning Reserve Service Operating Reserve - Supplemental Reserve Service
- Real time cost-based energy market
- Daily capacity markets
- Monthly and multi-monthly capacity markets
- Real time competitive energy market
- Transmission Rights Auction
- Day-ahead market for energy
- Regulation market
- Spinning Reserve market