

## ELECTRICITY DISTRIBUTION BUSINESS IN TURKEY: CURRENT STATUS AND FORTHCOMING PRACTICE

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### ABSTRACT

*Turkish electricity distribution and retail sale market is going through very difficult period. The market has attracted 15.8 billion USD from tenders and 9.41 billion USD will be spent during 2011-2015. Settling a stable market is the very first condition of financing of this amount. At the moment, EMRA is always working cooperatively with all stakeholders and continue like that in order to handle the problems of the market.*

### INTRODUCTION

Turkish electric industry had been dominated by one vertically integrated utility called TEK (Turkish Electricity Institution). In 1994, TEK was divided into two sub-companies called TEAS (Turkish Electricity Corporation) and TEDAS (Turkish Electricity Distribution Corporation). While, TEAS was the owner and the operator of generation and transmission assets, TEDAS was responsible for distribution and retail sale.

Electricity Market Law (EML) of 2001 has initiated the restructuring process which aimed to form a competitive electricity market. Market reform started with division of TEAS to 3 companies. These companies are EUAS (Electricity Generation Corp.), TETAS (Turkish Electricity Wholesale Corp.) and TEIAS (Turkish Electricity Transmission Corp.). TEDAS was left as it is.

After the completion of institutional restructuring, Energy Market Regulator Authority (EMRA) has been founded on late 2001. Secondary legislations were prepared by EMRA and completed within 4 years. Competitive wholesale electricity market called DUY (Balancing and Settlement Market) has initiated in 2006.

Regulatory reforms made the market ready for privatization of distribution followed by generation. Turkey's electricity privatization program was launched in 2008, with the tender of 4 distribution system operators (DSOs). By November 2010 all tenders of 21 distribution companies have completed. At the moment, the operation rights of 12 companies are fully transferred to their new owners and transactions are planning to be completed up to mid 2011 for the rest 9 DSOs.

### DISTRIBUTION TENDERS

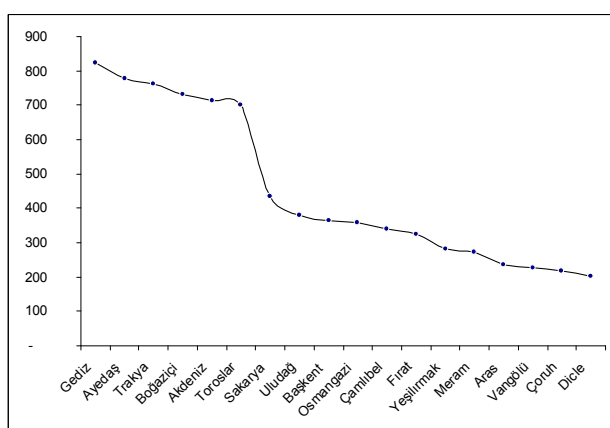
Before privatization, TEDAS was divided into 20 separate regional distribution entities. Kayseri was the only distribution region operated by a partially private company called KCETAS. TEDAS signed TOR (Transfer of Operational Rights) agreements with regional entities. Under a TOR, the private enterprise would operate (and rehabilitate where necessary) an existing government owned facility through a lease-type agreement [1]. It has been planned that during the tenders, the bidders are going to compete for 100% block shares of the regional distribution company. Then, privatization tenders were kicked off in 2008 with Baskent and Sakarya regions and successfully completed on November 2010 with Ayeddas, Akdeniz and Toroslar regions. As seen in Table-1, Turkey's National Treasury collected considerable revenue of 15.8 billion USD from distribution tenders.

**Table 1 Distribution Tenders**

Region	Highest Bid mUSD	Status
Dicle	228,00	Transactions continue
Vangolu	100,10	Transactions continue
Aras	180,00	On trial
Coruh	227,00	Transferred
Firat	230,25	Transferred
Camlibel	258,50	Transferred
Toroslar	2.000,08	Transactions continue
Meram	440,00	Transferred
Baskent	1.200,00	Transferred
Akdeniz	1.165,00	Transactions continue
Gediz	1.920,00	Transactions continue
Uludag	940,00	Transferred
Trakya	622,00	Transactions continue
Ayeddas	1.813,00	Transactions continue
Sakarya	600,00	Transferred
Osmangazi	485,00	Transferred
Bogazici	2.990,00	Transactions continue
KCETAS	-	Transferred
Aydem	-	Transferred
AKEDAS	-	Transferred
Yesilirmak	441,50	Transferred
<b>Total Revenue</b>	<b>15.840,43</b>	

There are some points that need to be explained in Table 1. First of all, KCETAS, Aydem and AKEDAS regions have special rights from Law No.3096 and they were transferred to their owners without tender. Secondly, although Aras' tender was done in 2008, the region could not be transferred due to the trial on Turkish Supreme Court.

When we look at the (revenue/number of customers) ratio by region in Figure 1, Gediz seems the most valuable region from the investors' perspective. Gediz region places in the western side of Turkey and encloses Izmir, Manisa provinces. The technical loss and electricity theft ratio, 8.48%, is relatively very low in Gediz region. Also, people are more likely to pay their bills in that region therefore payments received percentage is high. Vice versa, in Dicle region technical loss and theft ratio is the highest in Turkey with 60.96%. Moreover in Dicle region payments received percentage is very low. And as it seems in Figure 1, Dicle tender was the lowest bid per customer.



**Figure 1 Tender Revenue/Number of Customers Ratio by Region (USD/number of customers)**

## TARIFF STRUCTURE

General principles of the tariff methodology are defined in Article 13 of EML and the structure is explained in Electricity Market Tariffs Regulation and relevant communiqués. End user tariff has five main components which are retail sales, distribution system usage fee, retail service, transmission fee and taxes and other fees. The sub-components of end user tariff are calculated according to the following formulas.

Retail Sale = Weighted Average Purchase Cost of Energy \* (1/(1-Loss&Theft Allowance)) \* (1+Gross Profit Margin)

Weighted average purchase cost of energy stands for electricity supply price from generators which is subject to price cap defined by EMRA. Loss & Theft allowance is determined by EMRA for each region at the beginning of each implementation period. Gross Profit Margin is a

percentage applied to all the cost and expenses covered for retail sale and determined by EMRA at the beginning of each implementation period. Every company operates with same gross profit margin.

Distribution System Usage Fee: Revenue cap / Estimated total distributed energy

DSO's operating and capital expenditures are subject to revenue cap which is approved by EMRA at the beginning of each implementation period. Also, every year EMRA analyzes demand forecasting methodology of every DSO and approves next year's estimated total distributed energy.

Retail service is composed of operating and capital expenditures related with indexing, billing and meter reading. It is also subject to a revenue cap and retail service fee is calculated similarly with distribution system usage fee. Transmission fee is reflected pass through the cost of the transmission system.

Taxes and other fees: VAT is at 18%, municipality fee at 1% for industrial and 5% for residential, other fees approximately at 3%

## Transition Period Tariffs (2006-2010)

First implementation period in the distribution regulation was between 2006-2010 and called transition period. Due to the Article 9 of EML; TEDAS prepared the 21 region's distribution and retail sale tariffs and EMRA approved the tariffs without any change. The end user tariff is basically composed of revenue requirements of distribution companies. Revenue requirements cover the projected expenses for providing distribution and retail services and provide an allowance for the target level of technical and non-technical losses. Transition period could be considered as endeavor for a smooth transition from natural tariff to a fully cost-based tariff system.

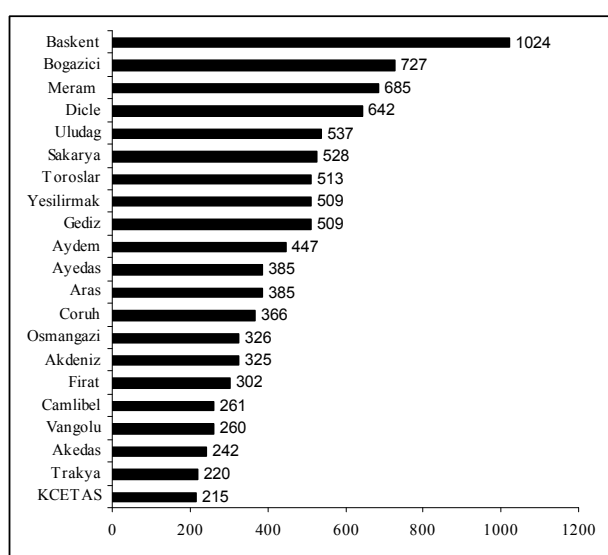
**Table 2 Transition period national tariffs (UScent/kwh)**

	2006	2007	2008	2009	2010
Industrial - MV	7,6	7,4	7,4	7,4	7,5
Industrial - LV	7,9	7,8	7,9	7,9	7,9
Commercial	8,8	8,8	8,8	8,8	8,8
Residential	8,7	8,6	8,7	8,7	8,8
Agricultural Irrigation	9,5	9,2	9,0	9,0	8,9
Lightening	8,5	8,5	8,3	8,1	8,1

During transition period, nearly 3.5 billion USD, which is 0.1% of national GDP, spent for investments in Turkish electricity distribution industry.

### New Implementation Period Tariffs (2011-2015)

On December 2010, EMRA announced distribution and retail sale tariffs for 2011-2015 implementation period. EMRA approved 8.16 billion USD for distribution revenue cap, 1.25 billion USD for retail sale revenue cap and totally 9.41 billion USD that will be spent during the years 2011-2015 in Turkish electricity distribution and retail sale market [2]. The budget is distributed amongst 21 DSOs as following.



**Figure 2 Revenue caps of DSOs in 2011-2015 Period (million USD)**

Total capital expenditure budget for DSOs in the new implementation period is approximately 6 billion USD. This number seems relatively high compared to the transition period. It is because during 2011-2015, EMRA pays attention and allocates considerable amount of budget to technological investments such as SCADA, geographical information systems and other automation systems. Although capital expenditure budgets increased; end user national tariff remains same due to decrease in operational expenditures.

### Price Equalization Mechanism

In May 2006, an article was added to EML which was presenting a new mechanism called price equalization. Due to the massive differences of electricity theft ratios between regions; government decided to move to national tariff from regional tariff. According to EML, the regions that have high theft ratio are being subsidized with price equalization mechanism until Dec 31<sup>st</sup>, 2012. It is being planned that regional end user tariffs will be initiated by Jan 1<sup>st</sup>, 2013. However, it should be noted that government always has the authority to postpone the transition to regional tariffs.

### **PROBLEMS OF THE MARKET**

Regulatory reform in Turkish electricity market has started in 2001 with EML. Since then numbers of secondary regulations has been issued. However, it can be said that legislative infrastructure of the market is still passing through an evolution process. In this context, when we look at distribution and retail sale legislations specifically; there exists 17 different secondary regulation that affects distribution market directly. Moreover, 55 amendments were made during last 8 years. These can be considered as evidences of evolution process and the regulatory authority's endeavour to form a stable legislative structure. Nevertheless, at the moment distribution legislation seems quite unstable which leads common misunderstandings among stakeholders. Some phrases could be commented in various ways. In those cases, EMRA issues a board decision in order to clarify the situation. However, trials at court against secondary regulations and EMRA's board decisions increase as much as number of private companies in the market increases.

The complexities raise pessimistic thoughts about future of the market. On the other hand, all these regulations, amendments, board decisions, court trials can be considered as fundamentals of a stable distribution market. In order to get rid of complexities, legal authorities and market players have to believe in one simple but very effective idea; the lessons learnt from the hotchpotch of ideas and their practical uses will result to find the best suited model for the market.

It is suitable here to give an example from European market. In 1995, most of the European countries were using cost plus method in distribution regulation. Between the years 1995 and 2000, performance based regulation (PBR) gathered popularity in Europe and in year 2000 half of European countries started to use PBR. At the moment, except a few countries, all Europe embrace PBR. However, there is an increasing debate in Europe about PBR. It is being argued that PBR will loose its popularity in very near future due to two main reasons; first of all in many countries the best practice levels achieved and secondly no value creation for new investments [3]. European countries derived their lessons from the points where PBR lacks and may be they will implement a new regulatory model for electricity distribution.

Another problem of the market is the lack of reliable data. Regulatory authority absolutely needs as much as possible data in order to determine appropriate budgets. Also new owners of the DSOs have to know their network's properties very well in order to plan the future in a cost effective manner. During TEDAS time DSOs gave less importance to data recording. TEDAS has been announcing statistics yearly for every DSO. However, these yearly statistic books

include conflicts with each other. The problem can be solved with developing a database within EMRA. All the data about transformers, cables, lines and other network components will be stored in this database. And except commercial secrets this data shall be open to public. This database will help EMRA in many ways, such as supervision of the market, determination of capital and operational expenditure budgets, planning the future of the distribution system and choosing the best method for the market. Also, academics will use the public data in order to make detailed analysis which will also make fruitful contributions to market development.

Turkish electricity distribution regulation uses an incentive based method which offers more revenue to the DSO whose electricity supply and service quality is better. Vice versa, the company whose service and supply quality is worse will lose money at the end of the implementation period. However, due to the lack of necessary automation systems, electricity supply quality figures could not be provided. According to the regulation, DSOs have to install necessary automation systems until Dec 31<sup>st</sup>, 2012. In this context, EMRA announced an amendment to the regulation which postpones quality incentives to Jan 1<sup>st</sup>, 2013. It is being planned that supply and service quality data will be provided appropriately after installation of automation systems and incentives for quality will be offered after retrieving reliable data.

Transition from national tariff to regional tariffs will be very difficult challenge not only for EMRA but also for all other governmental authorities. If all the targets are achieved, at the end of 2012, Dicle region's loss and theft ratio will be 50.63% while Uludag's ratio will be 6.90%. This implies that customers in Dicle region will pay to electricity approximately twice of customers in Uludag region. Dicle is located in the eastern part of Turkey where unemployment rate is relatively high and income per person is low among other regions. Thus, it will be very hard to explain a dramatic increase in electricity end user tariff to customers that are living in regions which have high theft ratios. Also there exist much people in the market who believe that transition to regional tariffs will increase electricity theft. In order to handle the problem, central and local authorities and also DSOs have to cooperate and pay attention to public relationship more. Another solution can be developing a social tariff mechanism which will allow subsidization of the poor customers in all regions.

## CONCLUSION

The distribution and retail sale market in Turkey is going through very difficult period. During this high tension era, EMRA, as the authority who issues all the legislations, has the most crucial role in the market. EMRA shall continue to issue new amendments with cooperation of all stakeholders.

Qualitative and quantitative impact analysis shall be made and effects to the market carefully evaluated before issuing a new regulation.

The tenders have attracted 15.8 billion USD and total revenue requirements of 21 DSOs cost 9.4 billion USD in the years 2011-2015. Totally, 25.2 billion USD is going to be financed in 5 years. Signals of the stable distribution market will be very helpful for investors to reduce their debt interest rates.

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