

IMPROVEMENT OF TRANSMISSION AND SYSTEM OPERATOR ACTIVITY BASED ON REVENUE CAP REGULATION FOR TRANSMISSION TARIFF

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1. Price control regulation

The consumer protection, while ensuring the company has an incentive to operate efficiently, represents the main aim of a price control regulation. The price control signifies a constraint on the overall level of the company revenue and corresponding prices so that the consumers do not pay unnecessarily high prices, which is undesirable.

According to its legal competency (Energy Law – nr.13/2007), the Romanian regulator (ANRE) have selected and implemented in the year 2004 the revenue cap regulation, as form of price control, applied from 2005 year to the transmission and system operator, for a three years regulatory period.

According to this incentive mechanism, each year, the revenue increases $(1+IPC)$ in line with inflation (IPC - consumer price index), but is reduced with efficiency increasing $(1-X)$ by a smoothing factor (X) established by the regulator.

The application of this incentive type regulation secures:

- a fair allocation, between the transmission system operator and the customers, of the gains resulted from the increase of efficiency over the targets set by ANRE;
- the efficient operation of the transmission company;
- promotion of efficient investments in the transmission network;
- promotion of efficient operating and maintenance practices;
- efficient use of existing infrastructure;
- continuous improvement of the quality of the transmission service.

2. Revenue cap setting

The use of transmission network charges should satisfy the revenue cap formula as set out in the equation below:

$$R_{cap,t} = \left[\prod_{k=1}^t (1 + IPC_k) \times (1 - X)^t \times R_{reference} + KR_t + KR_p \right]$$

$R_{cap,t}$ - revenue cap on use of transmission network charges for year t ;

$R_{reference,t}$ - revenue in the year before the regulatory period beginning;

IPC_k - forecasted annual percentage change in the Consumer Price Index;

X - efficiency factor, smoothed along the regulatory period and applicable to Operation and Maintenance (O&M) controllable cost;

KR_t - quantity correction factor in year t ;

KR_p - investment correction factor at the level of the regulatory period p ;

t - an year of the regulatory period p ;

k - years of the regulatory period p ;

The principles and objectives of the regulatory regime, include the elimination of “monopoly pricing”, providing a fair return to network owners and creating incentives for TSO to pursue ongoing efficiency gains through cost reductions. In implementing this framework, the building block approach calculates the maximum allowed revenue (R) as the sum of:

- Capital expenditure related to:
 - return on capital cost (capital remuneration - $WACC \times RAB$);
 - return of capital cost (depreciation - D).
- Operating and maintenance (OPEX) expenditure related to:
 - controllable costs ($OPEX_{con} = OPEX_{reference} \times (1-X)$);
 - noncontrollable costs: ($OPEX_{noncon}$), acquisition of grid losses (L), congestion removing (CON) and cross-border trade (CBT).

The building block (total cost) equations are as follow, for each year t of the regulatory period:

$$R = (WACC \times RAB) + D + OPEX_{con} + OPEX_{noncon} + L + CON + CBT$$

where:

R = maximum allowable revenue

WACC = weighted average cost of capital

RAB = regulatory asset base (Investment - Depreciation)

$$RAB_t = RAB_{t-1} + I_t - D_t$$

I_t = investments committed in year t

D_t = regulated depreciation in year t

3. Efficiency factor X

3.1. Cost controllability

The revenue cap mechanism aims to provide incentives for better productivity in the assumption that the company is able to control its level of costs.

There are some costs there are not under the company’s control and therefore, it would not be reasonable to expect any productivity improvements in this area. Such noncontrollable costs may include items as taxes, regulatory contributions, costs resulting from force majeure.

The incentives would only be applied to controllable cost items, noncontrollable costs would be allowed to be passed through to consumers on the basis of actual costs. In the first and second regulatory period, the TSO will be allowed to keep the profit over the efficiency gains level established by regulator. To compute the capped revenue for the third regulatory period, the regulator will determine the efficiency gains over the established target for the second regulatory period and which will be 50% shared with the customers of the transmission service (gains sharing mechanism) and respectively, 50% with the TSO. This amount will be reduced from the corresponding revenue after the application of the efficiency factor, in the first year of the third regulatory period.

Some of noncontrollable costs are considered noncontrollable while in reality, these costs can be influenced by the company. For example network losses costs are driven by two factors: quantity of losses (kWh) and the price for losses acquisition (lei/kWh). At least one, but generally both of these factors are more or less controllable and influenced by the company. The losses quantity can be reduced by different operating measures (higher voltage levels, increasing network capacity, using better equipment). Similarly, the price paid for losses may be reduced by using the market facilities. If the regulator would consider network losses fully noncontrollable, the company would have neither incentive to reduce these losses, nor to purchase the electricity at lowest price possible. As follow, the Romanian regulator will adopt, for the second regulatory period, a cap for the forecasted losses quantity. The registered cost under / above this cap will represent additional profit / cost for each tariff period.

3.2. OPEX measurement

OPEX typically includes the costs of personnel, maintenance, buildings and office rentals, administration, transportation, etc. The company could adjust its level of OPEX in a relatively short period. For example, it could reduce its maintenance activities according to new investments achievement, dispose of personnel, or attract additional staff.

The controllable operating and maintenance costs considered as starting point at the beginning of the second regulatory period will be the actual operating and maintenance costs in the last year of the first regulatory period on top of which it is added half of the difference between:

- the controllable operating and maintenance costs previously forecasted by the competent authority for the last year of the first regulatory period, and
- the actual controllable registered operating and maintenance costs by the transmission system operator, in the last year of the first regulatory period which should not be higher than the value previously approved by the regulator. This provision does not apply if the actual controllable O&M costs for the last year of the first regulatory period are higher as compared to the controllable operating and maintenance costs, previously approved by the regulator.

In this case, the starting point at the beginning of the second regulatory period, will be considered the controllable O&M cost previously established by the regulator for the last year of the first period p.

Some of these provisions and consequences of increasing / reducing of efficiency factor level approved by regulator are reflected in the study case shown in the table below:

- X factor increasing over the approved by regulator efficiency gains level ($2.8\% > 1\%$) leads to additional profit but to a higher improvement level (0.97 applied to controllable O&M is more restrictive than 0.99) established for the next regulatory period. In the same time, the reference values of controllable O&M for the next regulatory period p will be limited at a lower value than that forecasted for the last year of the previous regulatory period p-1 ($101 < 114$);
- X factor reducing under the efficiency gains level approved by regulator leads to less profit and to a reference values of controllable O&M for the next regulatory period p equal with that forecasted for the last year of the previous regulatory period p-1.

Both of these cases are disadvantageous for TSO implying corresponding effort to reduce O&M expenditure in the next regulatory period.

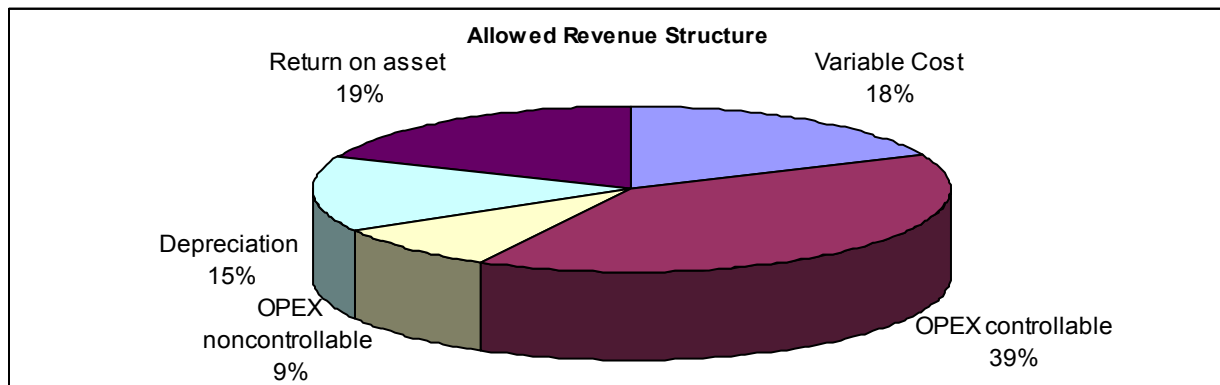
	Regulatory period p-1, years:			
	Reference	1	2	3
Controllable cost (CC) - forecasted values	100	99	98	97
X forecasted		1%		
(1-x) = (CC) forecasted yearly improvement		0.99	0.99	0.99
(CC) forecasted nominal values (1-IPC)		106	111	114
(CC) Registered values	100	94	84	89
Registered yearly improvement (1-x)		0.94	0.90	1.06
Additional profit		5	14	8
X registered		6%	10%	-6%
X registered -yearly average		3,5%		
80% X registered = X new		2,8%		
(1-X new)		0.97		
(CC) reference values for regulatory period p	101			

4. Financial Performance of the Romanian TSO

ANRE sets the revenue cap for TSO based on its decision concerning the forecast of the efficient costs and efficient investment as well as a reasonable rate of return on assets employed to provide the transmission service.

TSO receives a return on asset (the value of the RAB) which includes forecasted capital expenditure minus the corresponding depreciation rolled over along the regulatory period. Altogether, this **return on asset plus the depreciation** represents about **34 %** of the revenue.

Controllable OPEX may constitute more than **39 %** of the revenue. The efficiency loss will be penalized, at the end of each year of the regulatory period, by profit reduction.



Noncontrollable OPEX, including both Noncontrollable maintenance and operation costs and congestion removing, cross-border trade costs, may constitute more than **9 %** of the revenue.

Losses, as variable cost, constitutes **18 %** of the revenue.

5. Result of the second year application

The difference between the TSO' actual performance and the assumptions contained in ANRE' revenue cap decisions established at the beginning of the regulatory period represents the correction factors applied to the revenue for the next year.

The revenue cap is then used by TSO to determine transmission prices. Usually, there are small annual variances of the revenue. If the TSO exceeds its revenue cap, it must adjust its revenue and transmission prices in the following year.

5.1 Revenue correction factors for the second year of the regulatory period

The revenue corrections due to the variation of the transported electricity quantity (Q), and the difference between the forecasted and registered values of the: acquisition cost of the electricity covering grid losses (L), removing the network congestion (CON), and cross-border exchanges (CBT) are computed for each year t of the regulatory period p and represent positive / negative costs which have to be correspondingly reflected in the revenue.

ANRE determines the justified impact on the regulated revenue due to the differences between the forecasted and registered values and decides the level of the correction factor in the application period.

Correction factors	Correction factors value (%)
Q quantity	-4.38
L losses	+3.30
CON congestion	-2,12
CBT cross-border trade	+0,58
CA capacity allocation	-3,23
Others	-1,72
R_{2006}	100.00

The regulated revenue for the year 2006 of the regulatory period 2005 - 2007 was computed tacking into account the correction factors mentioned above applied to the revenue for the year 2006, R_{2006} established at the beginning of the regulatory period.

5.2 Revenue correction factors at the end of the regulatory period

Tacking into account the impact of investment in the revenue setting, ANRE carefully monitors the investment plan commitment in the years 2005 and 2006. The revenues correction due to the difference between the registered and approved by ANRE investment plan in the regulatory period $p-1$ is reduced from the regulated revenue from the first year of the next regulatory period p .

6. Future steps

The price control applied by ANRE for the first time in 2005, concerns the regulatory period 2005-2007 have had a major scope to protect consumer interests by a fair allocation, between TSO and customers of the gains resulted from the increase of efficiency over the targets set by Regulator. In the same time, taking into account the transmission network represents the basic infrastructure shared by the market participants and the TSO has to ensure the Romanian Power System reliable and stable operation, the price control ensures the TSO efficient investments in the transmission network providing a corresponding return on assets.

Future steps to be implemented in this field are the following:

- the implementation of a mechanism in order to asses the ex-ante and ex-post investments efficiency;
- the more correct forecast of the transported electricity quantity and corresponding losses in order to avoid a major impact on the revenue correction from the next year of the regulatory period.
- to promote continuous improvement of the quality of the transmission service, beginning with the second regulatory period, ANRE will introduce in the cap revenue formula a correction factor concerning the service quality level - important supplement to the incentive price control resulted based on monitoring of the continuity of supply and the availability of transmission system.

References

- [1] Methodology for establishing the tariffs for the electricity transmission service - ANRE 2006
- [2] Revenue Cap in Transmission - KEMA 2004
- [3] Transmission and System Operator - Financial Reports