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Transparency in tariff regulation - a mechanism to stimulation of the energy consumption efficiency

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Abstract: The consumed product or services are always a value of number of operations, such as power generation and distribution in power engineering, and consequently the decrease of power consumption brings to reduction of power generation. The cost of any exclusive or competitive products or services always contains a constant part, which does not depend on the volume of energy consumption and variable one, which is determined and depends on the volume of demand and consumption.

Here is a need to remove the disadvantages of existing scheme of price and tariffs settlement for goods and services of natural monopolist and it is proposed the schemes of tariffs calculation, which will improve the reliability and transparency of settled tariffs

Key words: Heat power plant, energy, fuel, natural resources, thermal, electric, cogeneration, regulation, emissions

Efficiency of the power consumption is determined by the influence of several factors total of [1]:

- The ability to monitor and control;
- The ability to regulate;
- The reliability of accounting of energy consumed;
- Energy consumption characteristics of the device;
- Optimum cost of the product consumed;
- An informed, clear and transparent formation of the cost of products or services.

The consumed product or service is always a value of several operations, such as production and delivery, and in connection with the reduction in consumption means a greater reduction in production. The cost of any, exclusive or competitive, products or services always contains a constant part, which does not depend on the volume, and a variable part, which is determined by the volume of consumption, by demand. In the case of the market acquisition a Consumer reacts to the unclear cost by the escape leaving to other Suppliers. However, in the case of products or services of a natural monopoly a Consumer is deprived of this form of reaction to the formation of the cost. In some cases, the Consumer has not even the possibility of refusal of the service or moreover, he is "imposed" with certain amount of services or product, such as the amount of heat energy consumption for heating in apartment buildings, by setting the minimum allowable temperature in a heated room. In this regard, the transparency of the determination of products cost or services cost of a natural monopoly is very important for its sustainable operation.

The cost of energy production: - electricity, heat, or liquefied natural gas from the gas tanks etc., [2,3], - contains cost of service, as networks readiness for transportation of heat transfer agent, and cost of products, as the amount of energy delivered. In almost all cases, the Consumer receives a single receipt that shows the unit cost (price or tariff), the amount of energy consumed and the total amount to be paid. The cost per unit of output (the competitive part), implicitly present payment for network services (exclusive part), which historically is "tied" to the amount of energy consumed. In the most general case, the consumption value is quite volatile, as follows:

- for heating - the temperature in the room and outdoor;
- for electricity consumption - time of the day – lighting household appliance part, including the period of usage;
- for household gas consumption - cooking, or heating volume;
- hot water - time of the day and week, and season.

The variability of the amount of energy consumed by the existing scheme of determining the value of network services, resulting in variability of network services charges. This in its turn greatly complicates the state regulation and markedly reduces the transparency of tariffs for network services. Moreover, in this case there is covert cross-subsidizing of one user by another. For example, lower level of the temperature in some premises as industrial sites, shops, sports facilities etc., supposes a smaller payment for the service of heating networks. Or vice versa - raised level of indoor temperature as for bath, child care centers, some sort of industrial premises requiring higher temperature, supposes a higher expenses for network services. A similar pattern is observed in the supply of electricity or gas. One of the way of avoiding of such an "injustice" can be split in the payment of the services or products of natural monopoly. To divide a Cost of readiness or availability to provide services and the cost of the consumed amount energy or volume of hot water. Cost of readiness is almost constant value in case of unchanged network configuration. The cost of reconfiguration or upgrading networks is predicted quite accurately on investment programs of monopoly. However, it should be noted that in this case there is an adequate amount of "injustice" because there is a need for "consumers diversity" of monopoly's costs. Most obviously this injustice visible in determining the cost of elevators use - inhabitants of the different floors, different number and frequency of use, different property area, different number of guests or visitors, etc. For any costs diversity scheme there are always be "offended" Consumer. Nevertheless, the division of networks' readiness and of the volume consumed simplifies the government regulation of the cost and improves the transparency of the established tariffs. Extraction of part of the cost of tariffs, which is slightly dependent on the volume of consumption, provides a significant support, first of all, to Suppliers and comfort for Consumers. In particular, while reducing the total consumption amount of money received for the goods is reduced by a smaller amount, which is the value of readiness cost, that present supports to the Supplier. With the growth of the volume of consumption of payment for the consumed energy is increased by a smaller amount, which is a Customer support.

In addition, it must be also developed a scheme of compensation of inevitable loss for transport companies. Currently under the existing scheme the losses are approved as a percentage of the transported amount of energy, which means a significant variability of the physical losses in the network. This is contrary to the physical nature of loss process appearing during transportation. During the transportation the physical volume of energy loss varies very little at unchangeable configuration and part of the equipment, with a significant variability of seasonal or daily consumption volume "peaks" and "dips". In this regard, they should be approved in the form of loss of values, which more fully reflects the "true" values and essence of the losses. For example, in the supply of thermal energy it is taken to claim the loss as a percentage of the transported volume. The loss percentage is calculated on the basis of certain physical losses in the network according to the regulating agency approved method. The transported volume also is the subject to fluctuations and changes considerably due to consumption changes. The quantities in physical losses depend on the network configuration, which may vary during the year, due to the switching-on of new sites of consumers, also on the used insulating material (mineral wool or polyurethane foam), by laying technology - flow channels or in the channel-free, and other. In the paper [3] it is shown the prospects of the application of calculation of heat loss per unit surface of the pipe network as an approved by the value.

With this scheme, it is possible to include the cost of the loss in value of the total costs of transporting company. Similar scheme is implemented in the loss calculation of electricity transporting system. This simplifies the calculation of energy delivery services of the sales company, as it occurs as if lossless transport. In this case, the transport company will be financially interested and motivated in reducing heat loss, with respect to the approved quantities. The inclusion of the cost of transport services of the company as

a separate line in the total receipt does eliminate the need for handling the transport company to the sales company with a request (demand) to pay its service - it will come at the expense of the transporting company passing through the sales company.

In conclusion, it should be noted that the allocation of fixed part of costs allows regulators to monitor the formation of the cost of goods in the competitive part of the energy complex as the production of electricity or thermal energy, as it is clear that significant changes in the composition of their equipment or do not occur, or is in accordance with the investment program, which in turn is controlled quite accurately.

The implementation of the proposed solutions for regulation of the value of the goods or services of the natural monopoly significantly enhances the transparency of tariffs and promotes awareness of Consumers acceptable ways to reduce the cost of natural monopolies' services or goods.

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