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District heating regulation: parameters for the benchmarking model

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Abstract

In this paper the authors have assessed the disadvantages of the current Latvian district heating (DH) regulation system and marked the next steps for a transition from hard regulation towards the approximation of benchmarking and market principles.

The current regulatory system in Latvia which is based on the “cost+” method is not motivating DH companies to increase operational efficiency and optimize investments. As a result, overinvestment in assets and poorly utilized production facilities resulting in additional costs which are shifted to the customers are observed.

In general terms, a cost-efficient DH tariff depends on the investment choices, conditions of capital utilization and operations performance. Using the operation data of Latvian DH companies, the authors analyze which cost drivers and exogenous factors (e.g. heat load density, scale, resource prices, DH technical parameters, etc.) are the most relevant for reflection of the mentioned three aspects and could be useful for the benchmarking model.

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1. Introduction

In Latvia, as in most of North-eastern Europe, quality of life and the operation of various sectors of the economy are strongly affected by access to affordable, reliable and high-quality heat supply. Latvia relies extensively on a district heating (DH) model of supplying thermal energy, and most cities have well-developed DH infrastructure. The infrastructure leverages a number of well-known advantages of DH: material resource savings thanks to economy of scale; a low number of concentrated sources of emissions is better than a large number of distributed sources, because

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it allows cost-effective solutions to matters of environmental protection; the possibility of large-scale combined heat and power (CHP) generation; compared to numerous small heating sources, improved efficiency of using renewable energy sources, making a significant contribution to the mitigation of greenhouse gas emissions [1].

However, DH does have a major weakness: it bears the elements of a natural monopoly. As a result, heat supply has been treated as a public utility, i.e. a service where one economic operator provides a very important, vital service to a large number of users who, owing to a range of technical and economic factors, have limited possibilities to select a different service provider or substitute the service they currently receive with a similar one. Consequently, DH services are mostly subject to regulation.

The economic essence of regulation is specification of prices and tariffs on goods and services provided by such natural monopolies. As a rule, the regulator should specify a price or tariff that covers justified expenses and allows adequate profitability that will enable company development and returns on equity, yet protect consumers from price gouging. Methods of regulation and its effectiveness have been subject to theoretical and applied discussions for decades, with two basic questions [2]:

- How justified are the expenses that a company reports to the regulator?
- What is a “moderate” or “adequate” rate of return on equity, and what would be the most appropriate way of defining the basis itself, i.e. a company’s equity?

The main criticisms of regulation have been the alleged inability of regulators to determine a “moderate” rate of return on equity, prevent inefficient capital expenditures and evaluate companies’ production costs.

The criticisms are rationally substantiated: objectively, the regulator and the regulated are in an imbalanced relationship. In practice, a regulated company has access to all information about its business activities and plans, whereas the regulator is only able to analyse and assess the information that a company has submitted in accordance with statutory procedures. As a result, a company will always have a better chance to substantiate the price project it has applied for than for a regulator to question it. Another pitfall of regulation is so-called over-regulation, when the regulator inefficiently allocates resources towards in-depth analysis and protracted discussions over marginal issues and justification of relatively insignificant costs.

At present, the overall trends in specifying pricing and tariffs for public utilities have been towards relaxing regulatory regimes; the ultimate result of such a process would be complete deregulation of prices and tariffs, subjecting them to the forces of competition where possible. However, a clear-cut answer to the question of how much regulation is justified remains to be found [3–5].

Latvia, like other countries in Eastern Europe, has established a relatively inflexible, “strict” regulatory regime for DH, applying the so-called “cost+” method, supplemented with several elements borrowed from the “price ceiling” approach [6]. Put simply, the method works like this: a DH company calculates and substantiates all expenses on generation, transmission, distribution and trade of thermal energy, then adding the allowed margin of return on equity, while the regulator reviews the cost substantiation and decides to either approve or reject the proposed tariff.

Practical application of the current regulatory model has had numerous flaws:

- It does not allow optimal investment in DH technology. Considering that all investments may be recouped with an approved tariff, DH systems are subject to elevated risks of over-investment and inefficient loading of facilities. The regulator’s range of instruments for rejecting the investments made is very limited, which does not motivate DH companies to prioritise and balance their capital expenditures. Consequently, there have been cases where the technological dimension would exceed the demand dimension, leading not only to elevated capital expenditures but also to decreased operational performance of technology due to low loadings.
- Low motivation to improve efficiency and optimise costs. In accordance with the tariff calculation methodology [6], a DH company must calculate heat supply costs and substantiate them with appropriate supporting documents. When verifying the expenses submitted by a DH company, the regulator can very often only identify that there are documents that substantiate an expense item but not what the substantiation itself is. As a result, even utterly scrupulous review of documents substantiating costs does not exclude the likelihood that some heat supply processes will be less than cost-effective.

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