

DISTRICT HEATING IN ROMANIA - A CHOICE OF EQUALITY OR EQUITY

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ABSTRACT

Household heating in countries like Romania is arguably one of the most important public services, and when district heating is in the question, problems of pricing of the thermal energy, technical losses and weather or not subsidies should be granted always arise. The challenge is, for most operators and local authorities, to balance the price paid by the population for eliminating the risk of energy poverty, while keeping public spending in certain limits. For this, we can discuss about technical aspects of the producer of thermal energy and of the distributor, or subsidies granted by the local government to cover the difference between the real price and what the population can afford. In this article we will cover certain aspects of subsidy allocation for thermal energy distribution and weather or not equality is more important than equity in this case of local subsidizing of a public service.

KEYWORDS: *comparative analysis, district heating, equality, equity, public service, subsidies, supportability.*

1. INTRODUCTION

Pricing of a public service has always been a sensible spot given the fact that for the operator, it must bring some form of profit, but the lower the price is the better for the population, and while in the business world the end goal is profit, for a public service provider the goal should be social satisfaction and stability. In this case, it falls under the responsibility of the local authority, in the case of decentralised public services, to come with a solution that protects those in need, while not exaggerating on public spending. In this paper we will discuss over whether, subsidisation of district heating public service is a good thing in its present form and whether a different kind of subsidisation model that balances in the favour of the poor should be implemented and how could one such model look like.

2. THE STATE OF KNOWLEDGE

The most common way of heating one's household in Romania must be through district heating systems, which are present to great extent in most countries that used to be part of the communist block around Eastern and Central Europe. Under the centrally planned economy, DH systems provided subsidised energy services to large parts of the population using standardised designs and building materials, while serving as an infrastructural base for the expansion of prefabricated panel housing estates. (Poputoaia, 2010). DH are getting even more attention these days in many parts of Europe, especially in the northern states because of one important advantage: they utilise heat that

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would otherwise be of limited use, hence raising the efficiency of resource usage. This is done by various alternatives: utilisation of waste heat from industries and waste incineration (Holmgren, 2006) and most importantly cogeneration of heat and energy. Some argue that if the share of electricity production from cogeneration would increase in Europe to 18 percent by 2020, the energy savings could represent three to four percent of total gross consumption in the European Union in 2009 (Riddoch, 2009). Even though, compared to private heating solutions, the DH system offers more security and tends to be more efficient in terms of CO₂ and other gas emissions, trough lack of investments and poor management, most of these huge systems suffer today from having outdated technological capabilities and great heat losses trough the pipes, that results into continually higher prices for the population.

As it can be observed bellow, in a chart created by the European Environment Agency, the efficiency of thermal power production in Romania decreased substantially from 2005 to 2014.

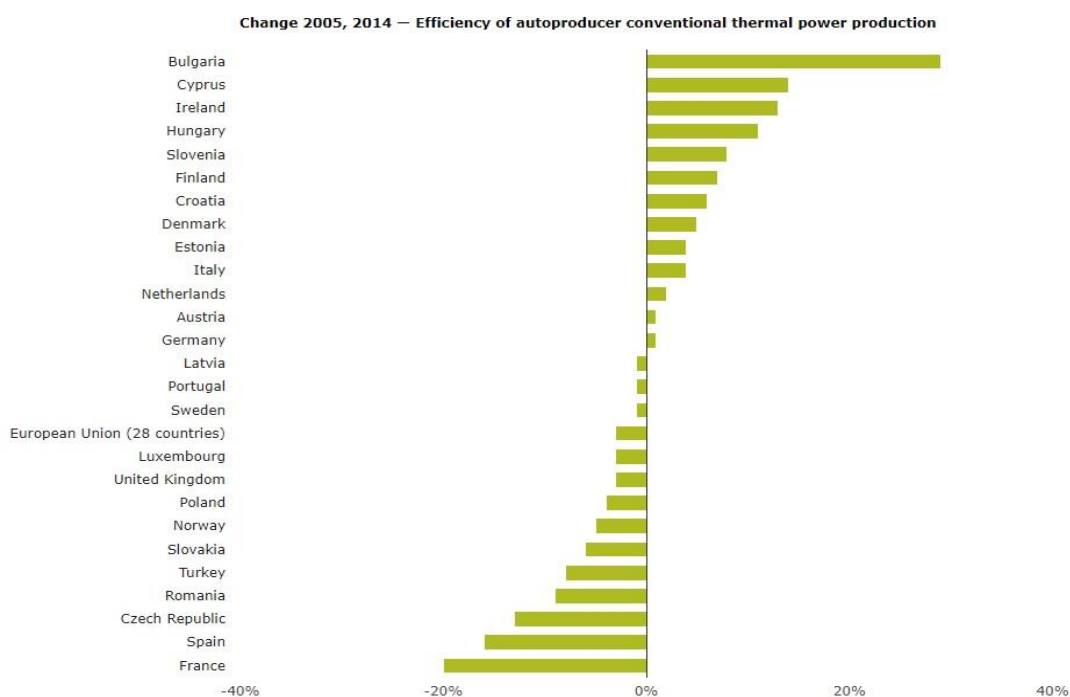


Figure 1. Decrease of efficiency in thermal power production around Europe

Source: <https://www.eea.europa.eu/data-and-maps/indicators/efficiency-of-conventional-thermal-electricity-generation-4>

The same rapport concludes that in the case of Romania, some plants operate at low capacity factors, because most of the installations are old and the redistribution of the thermal agent throughout the network, which should occur when customers disconnect from the network permanently, may not take place. In these cases, the plants operate sub optimally (European Environment Agency, 2016).

That is the case for the biggest DH system in Romania, the one present in Bucharest, and operated by RADET, in which heat transmission and distribution installations have an advanced degree of physical and moral wear, over 80% being in service for more than 20 years, with significant consequences for heat loss in the system, which in 2016 accounted for about 27% of the thermal energy entering the system (Shuleski et al., 2017).

All these bad practices and technical difficulties encountered in the DH systems lead to raising prices paid by the population who are connected to the system. For many of these citizens the DH system is the only mean for heating their household, private thermal plant having a much to higher

investment cost to ever be considered. In this case, citizens are trapped inside the system and have no control on the amount of money they must pay for household heating. Because household heating through dh systems is a public service and an indispensable one for many, the local authority that governs such a system must make sure that its citizens are offered social protection to some extent and the prices they pay for heating is in the limits of one's supportability. For this subsidies in correlation to the price of the gigacalories are offered to the operator of the dh system so that they can cover their costs while the population pays for only a portion of that cost.

There are those who argue that subsidies in energy tend to encourage wasteful fossil fuel consumption and benefit mostly high-income households, who only constitute a small proportion of the population (Mundaca, 2017) and that certain governments prefer to offer subsidies for fossil fuels and other forms of energy than to design effective policies for achieving more important economic or social objectives (Strand, 2016). Even though such points of view offer us great insight whether subsidies are good, there is a certainty that for some categories of the population they are essential, especially when discussing about household heating. For those that are in the risk of energy poverty, defined as impossibility (or the difficulty) for a household to gain access to the energy it needs to ensure dignified living conditions at an affordable price from the point of view of its income (Greive & Brynart, 2011), subsidies should be offered to the point that supportability of the public service is met.

One way of achieving this can be done through differentiated subsidization, in correlation with different levels of household incomes so that everybody gets to afford the public service in terms of supportability, because price liberalization of the energy markets will lead to an additional number of vulnerable consumers, and price support for all the population is not a solution. Therefore, some form of consumer-friendly pricing schemes must be considered (Andrei, 2015).

3. RESEARCH METHODOLOGY

In this research, for having a clear picture of the difference between prices paid for household heating in different cities from Romania we compared the following two: Bucharest vs. Brad city. Each of these cities have a dh system as main heating technology for most households, each must buy the thermic energy from a third-party producer even though the producer for the thermic energy in Bucharest uses high efficiency cogeneration, while for Brad that is not the case, resulting in lower purchasing price for Gcal in Bucharest.

The comparison mainly comprised of the following three aspects: price of heating, household income, and subsidy allocated by the local government. By comparing these indicators, we could observe whether or not some parts of the population benefit from lower prices than others. The second part of the paper presents a proposition of the researchers for granting different subsidies in relation to the price of heating, to different categories of people, based on household income.

The idea put into question in this paper is whether or not different categories of people should pay different prices for heating, based on their income and therefore on their supportability of the price. For this we created a scenario, for each of the cities analysed, in which households are divided into 10 groups, based on their income, each with different subsidy allocation into the price of 1 Gcal.

All the data needed for this research was gathered from reports, the national institute of statistics or through direct discussions with the representatives of the local authorities.

4. MAIN FINDINGS

In the first part of the research, the comparison between the two cities revealed that in the case of most cities the producer of thermal energy does not belong to the municipality and therefore they have little to no control over the price at which the operator that delivers thermic energy to the population buys the gigacalories that enter the system. This aspect was discovered to be worse for

the municipality of Brad who have a very high price of the thermic energy due to the high costs of producing it. In this case, the main reason is that the producer of thermic energy uses old and mostly outdated technology, but that is not the question of this research.

In the table bellow the main indicators of the research are presented on a timescale for the observation of differences between certain aspects regarding what the population should pay and what it usually pays.

Table 1. Main indicators regarding heating price and supportability for Bucharest and Brad municipalities (all values are expressed in LEI)

		2011	2012	2013	2014	2015	2016	2017	2018
Household income *	Bucharest	3121,55	3113,15	3327,46	3420,17	3671,6	4136,32	4797,79	5530,75
	Brad	2541,9	2733,13	2702,69	2587,56	2795,02	3126,89	3299,03	4005,04
Real Price/Gcal	Brad	896,84	896,84	896,84	896,84	703,22	680,53	674,86	674,86
	Bucharest	325,562	333,9072	386,9544	396,6512	393,9232	390,588	379,3125	395,25
Local Price/Gcal	Brad	295,00	295,00	295,00	295,00	233,00	225,48	223,60	223,60
	Bucharest	147,56	147,56	147,56	147,56	147,56	142,8	163,03	163,03
Subsidy (Real price - local price)	Brad	601,84	601,84	601,84	601,84	470,22	455,05	451,26	451,26
	Bucharest	178,002	186,3472	239,3944	249,0912	246,3632	247,788	216,2825	232,22

* The average household income of the west region was considered for Brad Municipality-Data taken from INS

Source: Authors

As it can be observed in table 1, the real price, without subsidization from the local government, is always higher in Brad, compared to Bucharest, mainly due to higher production costs. This ultimately leads to the municipality being forced to offer high subsidies for compensating these high production costs so that the population can afford heating their households in an adequate manner. Even though a good trend is observed, for Brad municipality in terms of subsidy allocation, this value is still two times higher in 2018 compared to the subsidy allocated by the municipality of Bucharest and even in these conditions a citizen from Brad will have to pay 223,60 lei/Gcal, compared to 163,03/Gcal for a citizen of Bucharest.

More so, as it can be observed in table 1, the household income in Brad is always at a lower level than that of Bucharest, meaning that the supportability of the citizens in Brad tends to be at a lower tariff level.

So, in these conditions, when municipality spending in subsidies is way higher in Brad, compared to Bucharest and still price levels of the first are at a more higher level than the latter one might argue that some parts of the population are more entitled than others. And if so can be the case of accessibility to certain aspects of the 21st century, in terms of global products, it shouldn't be the case when talking about public services, especially the ones like household heating, which are indispensable to the population.

Even though, certain aspects of this equation cannot be controlled by the government, be it local or central, as for example high production costs of the thermal agent (except through strong investments), certain models for delivering differentiated subsidies in correlation with the affordability of every household can be implemented so that the risk of energy poverty in terms of thermic energy can be eliminated. In this case we are discussing, at the level of one municipality what is to be considered fair. If equality means treating every citizen the same, without discrimination, and equity means fairness in every situation and helping certain marginalized sections of society, the local authority should decide over how subsidies should be allocated, nonetheless certain models can be used, as the one that will be presented bellow.

Table 2. Subsidy allocation in correlation to household income (all values are expressed in LEI)

Supportability 8%	Category 1	Category 2	Category 3	Category 4	Category 5	Category 6	Category 7	Category 8	Category 9	Category 10
Household Income	1394,33	1573,87	1938,71	2105,48	2394,89	2849,93	3223,93	3686,68	4223,63	6053,92
Real Price Brad	674,86	674,86	674,86	674,86	674,86	674,86	674,86	674,86	674,86	674,86
Real Price Bucharest	395,25	395,25	395,25	395,25	395,25	395,25	395,25	395,25	395,25	395,25
Local Price for each category (8% of total income)	111,5464	125,9096	155,0968	168,4384	191,5912	227,9944	257,9144	294,9344	337,8904	395,25*
										484,31**

*Price/Gcal for the 10th category for Bucharest

**Price/Gcal for the 10th category of Brad

Source: adapted after Anuarul Statistic al Romaniei, 2017

In the above described example, it was utopically considered that every household uses 1 Gcal of heat agent/month. In reality things differ based on the thermal specifics of the region and on the size of the house. For this, each municipality has to consider adjusting this levels accordingly.

As it can be observed in table 2, the model for allocating differentiated subsidies based on household income level takes into account good practices in the field, both nationally and within the European Union, that state that household heating should represent a maximum of 8% of the total disposable income.

In the case of Bucharest, we can observe that the 10th category of houses, for which the income is 6053,92 LEI, can afford to pay the full price of the thermic energy, not needing anymore subsidizing from the municipality. In the case of Brad, all the above categories must be subsidised but at a different level so that each of them can be set in normal levels of supportability of the public service.

This kind of differentiated subsidization of the service falls more on the side of equity and less on equality, having the tendency to help the marginalized members of society, while subjecting those with wealth to higher prices.

A model like the one proposed above, is very sensitive to the actual social structure of the consumers of the dh system. If in terms of income, many of the consumers are part of the higher categories, the municipality will have much to benefit, considering the reduced public spending. While this may be the case for Bucharest, where subsidisation is offered equally even to those with a very high income, for most of the small cities that use dh systems, high income households are not that present. Therefore, before implementing such a model a mapping of the social structure, in terms of income, of the consumers must be delivered.

5. CONCLUSIONS

Given the fact that today most of the DH systems in Romania offer highly subsidies prices to the population is creating difficulties for the local authority to invest in modernizing the system or offering quality maintenance. And with ever raising prices these subsidies must disappear at some point. The problem is that those type of consumers that today having difficulties paying for adequate household heating will struggle even harder if a new model for subsidization based on

income is not created. For Romania, as a member of the European Union, eliminating energy poverty is a prime objective and therefore, some kind of help has to be offered to those in need. Subsidisation based on household income could help attain supportability for everyone, while helping the local authority save money that would otherwise go into the subsidisation of high income houses, and ultimately invest it into modernisation of the dh system that will eventually benefit all the stakeholders.

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