

## A Success Story: Compact Fluorescent Lamps in the Hungarian Marketplace

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### Abstract

Over the last two to three years, Hungary has experienced a major success in the penetration of one of the key energy efficient technologies: compact fluorescent lamps (CFLs). This market success is not only remarkable in view of the short period while it happened, but in absolute terms: few countries in the world can boast with similarly high market shares with regard to CFLs. This market success is also remarkable in light of the high relative CFL prices compared to local salaries, which are much lower in the few countries where CFL market penetration exceeds that in Hungary. However, the paper also points out that this success has been very differentiated: while the market is close to saturated in some market segments, very little transformation happened in others. The analysis of a representative residential lighting survey suggests that these market segments maybe more prone to certain market barriers. Therefore, for a completion of the market transformation with regard to CFLs in Hungary, corrective policies or further market programs maybe necessary.

### Introduction

Increasing the efficiency of our energy consumption has been a prime target for decades, but it acquired a new importance in the post-Kyoto world. One of the socially most acceptable ways of increasing the efficiency of our energy use is energy efficient technologies, i.e. appliances that provide the same service at a lower energy cost. However, energy efficient technologies are usually more expensive, and even in cases where the investment into the higher price would represent a cost-effective investment, many energy-efficient technologies experience problems with achieving their optimal market shares. Numerous policies and programs have been launched worldwide in the past decades to promote energy-efficient technologies, with various levels of success. We have learned that promoting energy efficiency is not trivial, and for an optimal policy or program design a profound understanding is needed of the existing market barriers, market dynamics, consumer behaviour and other economic and social conditions.

Since so many energy-efficiency programs resulted in failure or limited success worldwide, it is always interesting to analyse success stories, and important to try to understand the keys to success. Especially in the case of the compact fluorescent lamp (CFL) technology, where two decades of various governmental, utility DSM and market transformation programs resulted in a modest 10% market penetration in the US residential sector, it is useful to examine success stories. The purpose of this paper is to look at one such a success story, the case of the CFL market in Hungary. We will describe the market transformation based on a representative survey done in Hungarian households, and highlight the few issues raised by the survey results. We will also point out that the success has been limited to certain market segments, and we will emphasise the need for further programs as a prerequisite for success in the remaining market segments.

### Background

Hungary, as all other economies in transition, has been going through profound economic, political and social changes during the last decade. By 1998, most of the Hungarian economy has been privatised, including a major share of the energy sector; and prices have been liberalised, including energy prices. In the meanwhile, unemployment exceeded 10%, and per capita GDP declined by close to 20%. As a result, the population perceived the rapidly climbing energy tariffs as one of the major burdens of the transition process. Paying for utility bills is problematic in large sections of the society: often one of the two incomes in a household is spent on paying for bills. According to some estimates, some 20% of Hungarian households have difficulty with paying for their utility bills in time. Thus, conserving energy has become a real need for Hungarian households.

On the national level, Hungary is very poor in domestic energy resources. It imports close to 50% of its primary fuels. While during the Soviet era half of the country's electricity was supplied by the Soviet Union, these imports have basically diminished by the early 1990s. Today, although the country has no major energy shortages, reducing the growth in energy demand would be highly desirable, since energy imports represent a significant burden on the national trade balance and currency reserves.

Hence, improving energy efficiency has been one of the priorities, at least on the rhetorical level, of Hungarian national energy policies. Surveys show that the population is also interested in saving energy, but often do not know how, or consider energy conservation "too expensive to be affordable". However, most people today do know about one way of saving energy – the CFL. While most people had no idea what a CFL was a decade ago, today most people "identify" energy conservation with the "efficient bulb", as Hungarians refer to the CFL, and a high proportion of the households own CFLs, despite their relatively high price compared to local salaries (a CFL purchase can account for as much as 25% of the monthly income in some income groups).

What is the extent of this "market success"? How fast has it happened? What were the key driving forces? These were the key questions that drove the following research.

#### Research Methodology

An opinion and market research institute, Median, has been commissioned by the author, with financial support by TUNGSRAM, to conduct a representative survey among Hungarian households concerning the use of and opinions related to CFLs. A structured, standardised questionnaire was used in the research. In the first phase of the research, which took place between June and August 1997, personal interviews were conducted with 2400 randomly chosen adults in almost 100 towns and villages in the country. The demographic makeup of the sample reflects the adult population in respect to residence, sex, age and level of education. Also, qualitative information was obtained from two focus group interviews conducted in July. Further qualitative interviews focusing on important areas highlighted by the survey have been conducted on a more random basis by researchers of the Environmental Sciences and Policy Department of the Central European University in 1997 and 1998.

#### Research Results: The CFL Market in Hungary

##### Rapid market success

In 1997, 80% of Hungarian respondents have heard of the CFL, while almost every fifth household, 19%, owns at least one CFL. Although this market penetration is lower than in a few EU member states, including the Netherlands, Germany, Denmark, Belgium and Italy, it is still significant. The 19% market penetration is especially remarkable if we consider that it is not only the highest or one of the highest among economies in transition and developing countries, but exceeds that of several highly industrialised countries with a longer history of CFL programs and campaigns, including the US, Norway and Sweden. This market success maybe even unique if we consider the brief time during the market transition happened: three quarters of Hungarian CFL owners have purchased their first CFL in 1995, 1996 or the first half of 1997 (when the survey was conducted). CFLs purchased prior to 1992 are installed only in every twentieth Hungarian household.

Another footprint of the market success is that most households are not only experimenting with the CFL, but own several of them. The average number of CFLs owned (among CFL using households) is almost 3, and 11% of CFL using households have more than 6 of them. Merely one third of CFL owners use only one such lamp. Although, again, this average (2.9 per CFL using household) is lower than that in a few EU member states, it is significant if we consider the short time period since the "market swing" started; the high CFL price compared to local salaries; and the lower number of lamps per household.

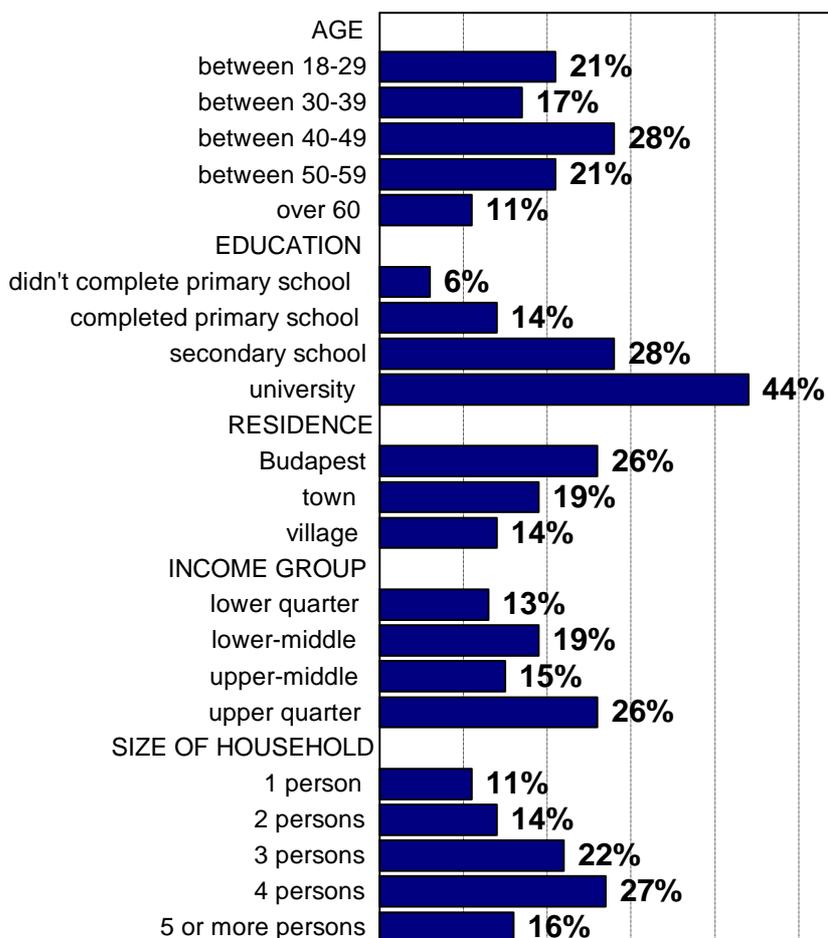
##### Success limited to certain market segments

Despite of the good news, Hungary should not relax over its laurels with regard to market transformation of an energy efficient technology. The detailed analysis of the survey results show that there are several signs indicating the need for programs or policies to further improve the market

penetration of CFLs. The key problem is that the rapid market success has mainly reached only certain segments of the Hungarian population.

According to Figure 1, the most important factor of the segmented market success is the level of education. While close to half, or 44%, of households holding college degrees own CFLs, only 6% of those with incomplete primary level education own one. While based on experiences from industrialised countries one would conclude that this may imply a strong correlation with income, this is not necessarily the case. Figure 1. shows that although there is some correlation with income, it is much less significant than that with educational level. There is also a strong correlation with the size of the household, which is a good sign. However, households generally using lighting the most hours (largest households), thus needing CFLs the most, do not own CFLs as widely as families with 3 or 4 members.

### CFL use by the sociological-demographical features of the respondents' and their families'



The social segmentation of CFL owners also highlights a few other problems. Less than half of ageing people own CFLs than the younger generations, even though the longer lifetimes of these lamps improve the life quality of the old generation more importantly by reducing the need for lamp replacement, and therefore the risk of falls. Another important shortcoming of the residential lighting market transformation in Hungary is that it is highly dependent on location. Almost twice as many households in Budapest use CFLs than households in rural areas. Furthermore, more than twice as many households (23-25%) own CFLs in the most developed central strip of Hungary (between Budapest and the Austrian border), than households (10-14%) in the Southern and Eastern counties.

Figure 1.

Market barriers still inhibit wide market success

As it was shown in the previous section, some market segments are much less affected by the market transformation process than others. Analysing the nature of the less affected segments, one can

clearly see that the strongly differentiated development of the CFL market is due to a few market barriers. For instance, people in rural areas probably have much less access to CFLs, or low-priced models. Social groups with lower level of education may not clearly understand the benefit of purchasing a much more expensive lamp. This latter hypothesis can be supported by the fact that *every second* respondent associated the term “Watt” with light levels, which obviously makes it much more difficult to make a responsible purchase decision for a CFL. Another problem earmarking the lack of sufficient education related to the CFL, is the choice of socket in which the lamps are installed. Only every third CFL is installed in sockets used three hours or more a day, and 17% are in sockets where they are used less than an hour daily. This indicates that although some residents make the energy-efficiency investment, with a less informed installation choice they forego much of the conservation potentials that could be achieved with their investment. Unfortunately, it is beyond the scope of this paper to discuss which other market barriers can be revealed by the analysis of the survey results.

### **Conclusions and Further Research Needs**

Our analysis of a representative survey of Hungarian households indicates that there has been a rapid and remarkable market success of CFLs in the last three years. However, we have also shown that this market success has been very segmented: market penetration rates depend strongly on educational level, income level and geographical location. We have suggested that the limited success in certain social groups can be attributed to market barriers. Since plain market forces are unlikely to overcome these market barriers, it is possible that for a further significant increase in the market penetration of CFLs in Hungary market forces alone will not be sufficient, and corrective policies or further programs are needed. One such potential program which may bring a breakthrough in overcoming market barriers in these social groups is the upcoming “ELI” (Efficient Lighting Initiative) program of the Global Environmental Facility (GEF), which was partially initiated in Hungary by the Central European University.

Unfortunately it was beyond the scope of the paper to analyse the reasons behind the rapid market success. Although the survey and the qualitative interviews gave an important insight to the key reasons for this rapid market success, further research is necessary to make responsible conclusions. The author believes that the lessons learned from the Hungarian CFL market success story can benefit the entire energy efficiency policy and business community of the world.

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### **References**

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