

Turning down demand through electricity disclosure: are consumers ready? A survey of Hungarian residences and businesses

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Abstract

Consumption of energy is influenced by a multitude of factors. Beyond factors determining the demand for a specific energy service, characteristics of and attitudes to the energy product delivering the service can also strongly affect this demand. Attributes of electricity which may influence the demand for electricity services include its cost, its environmental impacts, and the social/political context. Therefore, in a liberalised electricity market, the awareness of these attributes may have an impact on the demand for electric energy services and on the choice of the electricity product delivering these services.

There is increasing pressure worldwide to inform consumers about the characteristics of their electricity product by a mandatory labelling scheme, often referred to as “electricity disclosure”. However, currently there is little understanding of what attributes of their electricity products European consumers would most like to be informed about; in what form; how well they would understand and interpret factual information; and, finally, what impact such information may have on their consumption patterns and product choice. Our knowledge of this is even more limited in accession countries where markets are just opening up.

The present paper will report on focus group research and interviews conducted on the attitudes of Hungarian (as a typical EU accession country) residential and business consumers to their electricity supply. The research is conducted under the framework of an EU-funded multi-country

project “Consumer choice and carbon consciousness of electricity”. The aim of the present paper is to provide an answer to the questions above by gauging the understanding of Hungarians related to the environmental and social implications of their electricity product; and to provide an insight into the implications of a potential disclosure scheme on their behaviour influencing electricity demand and product choice.

Introduction

The liberalization of electricity markets across Europe requires further amendments of the existing European Union directives in order to achieve a sustainable and competitive market in electricity. Transparency, providing information to customers is one important aspect that calls for improvement. Responding to this need, The Council of the European Union published the text of a political agreement reached on the 27th of November 2002 on amending directive 96/92/EC (electricity) and directive 98/30/EC (gas) concerning common rules for the internal market in electricity and natural gas. Chapter II, Article 3, point 6 of the proposed amendments concerns disclosure of information related to the electricity supply. This point states that electricity suppliers are required to publish information about fuel mix in bills and promotional material as well as information or at least a reference to an information source about the environmental impacts of the electricity product they are selling (Council of the EU, 2002).

This step is of great importance in achieving transparency in the electricity market, however the details of disclosure policy are not known yet. It is not known what specific infor-

mation will need to be displayed, what level of detail and complexity the information will have, how often this information will be made available and through what information channels it will be made available. The European Parliament has still to decide on these details. Understanding consumer preferences and attitudes towards electricity, liberalization and environmental labelling is essential for designing the best-tailored policy.

Aims of the paper

The aim of the present paper is to contribute to the understanding of consumer preferences and perceptions affecting the design of the disclosure policy related to electricity supply. The objectives of the paper are to provide:

- background on the status of liberalization of the electricity market in Hungary;
- an insight into Hungarian consumer attitudes towards electricity market opening;
- an overview of the awareness of Hungarian consumers related to the environmental impacts of electricity;
- a presentation of Hungarian consumers' preferences with respect to the details of the disclosure policy design;
- an understanding of the expected implications of the introduction of disclosure in Hungary.

Background: introducing consumer choice in electricity in Hungary

Hungary has made most of the necessary steps for privatization and is in the process of liberalizing its electricity market under an EU-compatible framework. However in terms of liberalization, Hungary is lagging behind the rest of the transition economies (Stróble, 2003). The major part of privatization of the electricity sector took place between 1995 and 1997 (Pescic, Paizs and Ürge-Vorsatz, 2003). The New Electricity Act accepted in December 2002 (Electricity Act CX. of 2001) is a framework law which lays down the general rules of the market opening. Additional government decrees have been and are still being elaborated to regulate the specific details of the new market structures and operation. The above named act came into force on 1st of January, 2003. The major implication of the act is that consumers consuming 6.5 GWh/year or more are now eligible to choose their electricity supplier (Hegedűs, É., 2002). The eligible consumers are mainly large industries, but through a special decree municipalities are also eligible to choose.

The remaining schedule of market liberalization is unclear. The expected EU decisions with regard to the accession of Hungary will clearly have a major influence on these processes. In their absence, full market opening is expected between 2005 – 2010; however, no definite commitment has been made that further liberalization will take place in the absence of relevant EU regulations. The chosen market structure for liberalization is based on the most complicated model (that of Portugal). This means that the electricity sector will be cut into two all the way through from consumers to generators. There will be separate suppliers, grids, generators, and power plants for the public utility and for the com-

petition (Drucker, 2002). EU accession will speed up the pace of liberalization and will automatically remove some of the barriers described in the previous paragraphs. For example the requirement to purchase 50% of electricity from domestic sources will become void, since it would create unfair competition in the EU market. Governmental decisions to further regulate the operation and structure of the electricity sector are still being elaborated, so there is a lot of uncertainty about the future development of liberalization in Hungary (Ürge-Vorsatz, 2002).

While the eligible large consumers and municipalities represent 30% of the market, there are a number of legal barriers and other constraints that are expected to limit the competition, and thus fewer consumers may actually enter the newly opened market. An essential prerequisite for operation is still missing; none of the trading companies have received permit for beginning its activities at the time of the writing of this paper (Drucker, 2002). These barriers are present both on the supply and the demand side, the most important of these on the supply side are:

- *Limited price-competition due to persistence of monopoly supplier:* MVM, the former monopoly supplier, will go on supplying the non-competitive market and is eligible to retain power plant capacities as it chooses and this will diminish competition significantly. It is likely that MVM will retain the cheaper generators and declare off the more expensive ones. This will be a major drawback for the cost competition on the supply-side of the open market. Hungary's nuclear power plant is able to produce a major share of national electricity supply at significantly lower prices than the rest of the domestic generators. Therefore if nuclear energy is retained by MVM, the rest of the possible price mixes of domestic traders cannot be price-competitive with MVM offers.
- *Limited possibilities for import:* Low-cost competition can be expected mainly from imports, especially from the north (Slovakia, Poland); however, there is limited transmission capacity (Ürge-Vorsatz, 2002).
- *Legal barriers:* The necessary secondary legislation to facilitate change has not yet been forthcoming. For example, MVM holds valid long term contracts with the domestic generators and the, the validity of these would become questionable if a governmental decision would rule out the prevailing generator's price regulations (Stróble, 2002).

All these factors will limit the supply side of the market and may produce the curious situation when buyers will compete among each other, instead of the traders. Demand is also constrained:

- *The novelty of open market:* First of all, consumers are not familiar with an open market, so they may be reluctant to leave their "safe" public utility supplier and take the higher risks associated with the open market.
- *The old structure is hard to dismantle:* The procedure for leaving the public utility is quite complicated, so this will also be a limiting factor.
- *Legal barriers:* In addition, it is required by law that large consumers purchase a minimum of 50% of their electric-

ity from domestic sources (Ürge-Vorsatz, 2002). This is a serious constraint since domestic electricity on the open market is expected to be expensive.

Irrespective of how long and through which steps market opening will happen in Hungary, ultimately the result will be that consumers will be able to choose their electricity supplier. Therefore it is important to know how prepared consumers are for making informed decision when choosing their electricity supplier and what type of information, if any they would want to have to make such a decision. Presently, information disclosure is not yet required by law in Hungary although equally there is no legal constraint in the way of information disclosure. Most of the necessary information is already being generated and reported to a high level of detail, and a tracking mechanism will be required from January 2003 to monitor import restrictions, which could be built upon when introducing disclosure. The transmission of a complex array of information through future sales nodes is not expected to face barriers, but will be associated with increased costs (Ürge-Vorsatz, 2002).

Methods used

The overall aim of the research was to find out what the expectations of consumers were in relation to information disclosure - what type and form of information they are interested in or if they are interested at all. We also aimed to find out what the impact of a label would be, and to what extent would such a label would be able to provide the information consumers need in order to make value decisions such as those that would lead to them switching electricity supplier. The findings presented in this paper are based on focus group research with household and business customers and interviews with large consumers conducted in the framework of a multi-country project funded by the ALTENER program of the EU, entitled 4CE Electricity, "Consumer Choice and Carbon Consciousness". The research has been simultaneously conducted in five European countries: Great Britain, Sweden Austria, Germany, and Hungary - the latter is the only accession country among these. The focus group guide and interview research plan were designed in a common format to allow for comparison of results. In order to adjust the research to the country specifics and to complement the guide wherever necessary we consulted the 5 volume toolkit of Morgan David (Morgan, 1998) and the focus group research report from the American Consumer Information Disclosure Series by the National Council on Competition (Holt, 1998).

We chose focus group research because it allows for deep insight into people's thoughts, opinions and feelings. Focus group research is usually used for discovery and exploration to learn about topics that are presently poorly understood it also makes interpretation possible, that is it enables the researcher to understand why things are the way they are and what caused the present situation. (Morgan, 1998). Interviews for the large consumers was a good complementary to our focus group research, since it allowed for the same type of insight and also resulted in mainly qualitative information. In case of large consumers, since we talked with persons in high rank and a very loaded schedule we chose to

interview them also for the practical reason that this way we spared them of a trip to our University and allowed them also more flexibility with timing. The participants of the focus groups were typically Budapest residents and Budapest-based companies, while large consumers were representatives of companies from different regions of the country.

FOCUS GROUPS

During the months of October and November, 2002, four focus groups were held: a pilot focus group, two for households and one for small and medium size enterprises (SME). The pilot focus group was conducted to check the questions. Four participants were present at this discussion group. (Because of the relatively higher level of environmental awareness in this group, the findings in this group are scarcely reported in this article and only in relation to non-environmental issues.) There were nine participants in household group one (FGH1), ten participants in household group two (FGH2), and six in the SME group (FGSME).

The recruitment of participants for the household groups was done by a systematized random telephone sampling from the white pages and e-mail distribution lists. In case of the SMEs only random telephone recruitment from the Yellow pages was used. The household participants were screened for being first-hand tenants, the decision-makers related to electricity payments in the household. In case of SMEs the decision-makers in relation to electricity purchases were invited. In order to avoid biasing the participants, during the recruitment process the word environment was not mentioned. We introduced the topic of the focus group as inquiring about consumers' information needs related to their electricity supply and consumers' views on the liberalization of the electricity market.

The questioning protocol of the focus groups was built around seven key topics. As an introduction we asked the participants whether they will consider switching electricity supplier and electricity product when the market opens. In order to get participants thinking about labels we asked them about their attitudes towards labels in general. Although we recognized that electricity labeling is different than product labeling because electricity is not a tangible product, we found that labels in general was the closest association to our topic that is both familiar enough to participants and is sufficiently connected to our research topic to get people start thinking about the issues we were planning to discuss. The first and second key questions referred to the preferences participants had with respect to the types and representation of information on a potential electricity label. The third key topic was the perception of the different fuel sources used for electricity generation and their environmental awareness. Next, we investigated the information that consumers find relevant for choosing electricity supplier. Three different fuel-mix labels and three environmental indicator labels were designed and presented to the participants. The next questions referred to the content, level of complexity, detail and clarity of the labels presented. The last and seventh key topic was a collage exercise. Participants were asked to create their own preferred information label by using the already presented six labels plus two additional text labels. Participants were asked to make as many additions and simplifications as they wanted.

INTERVIEWS

During December 2002 and January 2003 five interviews were conducted, four with representatives of large electricity consumers, and one with the secretary general of the Hungarian “Industrial Energy Consumers Forum”. We were looking to interview those representatives of the companies who make and/or prepare decisions about the choice of the company’s electricity supply (chief electricity engineer, technical vice-president, chief electricity expert, energy sourcing manager). The question protocol used in the interviews was slightly from that of the focus groups. The main difference was that labels were not displayed for big consumers and the questions were less hypothetical, both because these consumers were eligible to step out on the market and because a draft proposal of the disclosure directive had been decided on and submitted to the parliament by the EU Council by the time the interviews were conducted.

The private companies interviewed were from the plastic, paper and oil and gas industries. The state-owned national railway company was also interviewed. Environmental considerations are an element in the strategy and policy of all the private companies involved, and all of these companies pride themselves on their environmental performance. Two of these companies have no environmental reporting aside from the statutory requirements. The annual electricity consumption of the interviewed private companies ranges from 3.5 million Euro to 70 million Euro. The state-owned national Railway Company is by far the largest consumer of those interviewed, with an annual consumption of 830 000 megawatt hours.

Findings

The main findings of the research are presented in this section. General findings draw together the outcomes of the research with the different consumer segments. In the description of the attitudes of household, small and medium size businesses, and large consumers we focus attention on aspects that vary among the different groups and will not repeat findings that were non-controversial and common to all the investigated groups since these are documented in the general findings section.

GENERAL FINDINGS

Awareness about electricity and environmental impacts of electricity

The general awareness related to electricity supply among Hungarian consumers was found to be low. Participants were aware about e.g. the monthly expenses associated with electricity but not in all cases about the price of electricity per kWh or technical parameters. The notion of electricity as a product with several attributes other than price, voltage and frequency, as well as the concept of choice in electricity markets was new to most participants. Liberalization and the possible mechanisms of switching suppliers were not commonly understood. The most frequent difficulties with understanding switching were: 1) that people could not imagine to be able to receive a *different* electricity product from their neighbor from the same grid; and 2) they also thought

it would cause too much trouble and it would cost too much to install new grids for each supplier. In each household group there were one or two participants who explained liberalization to the rest. In the SME group similar questions about the possibility of switching in practice (such as how to separate off the electricity generated in a specific power plant from the national grid) were raised but remained unanswered. Even among those who recently became eligible to enter the open market, i.e. large consumers, only two out of four interviewees understood liberalization.

Even though neither household nor business representatives understood well the mechanisms of liberalization, they were interested in switching. Most of the focus group participants and the interviewees would consider switching. We found that the level of satisfaction with the present supplier was predominantly high, and therefore the possible way for a competing supplier to differentiate himself would be a “price-advantage” and not really other factors, such as security of supply and customer service. A few people in the household groups and among the large consumer representatives expressed skepticism concerning the reliability of the new suppliers, and said they would wait a few months or a year so that they could better judge which suppliers are trustworthy.

Most people had difficulty with or were unable to make a link between fuel-mix and electricity. However, after the link was made for them, participants were able to name several fuel sources. There was some basic knowledge about renewable energy sources in all focus groups and also among large consumers, however this was typically not raised without specific probing. Participants of the focus groups were of the opinion that the term renewable energy would not be commonly understood by consumers and it needs further explanation. Awareness of environmental impacts related to electricity consumption was low in all the investigated groups. Mitigating environmental impacts of electricity generation was often thought to be the responsibility of the generators and policy-makers and not that of the consumer. There was low awareness about emissions, such as CO₂, sulfur, nitrate and particulate matter. However some people were aware of the CO₂ emissions of coal, thermal and gas-based power plants and about the radioactive waste produced and the accident risks associated with nuclear power. When probed further about emissions, other pollutants such as NO_x, SO₂, CO were also named by a selected few in the groups. Even though one or two more knowledgeable participants in each focus group also mentioned the link between carbon emissions and climate change (CC), the general understanding and awareness of this issue was low. When probed further people often stated that others, or “the average person” would not be aware of this link. We found that there was a misunderstanding among some participants about the connection of CC to the ozone layer. Several participants in FGH2 connected CO₂ emissions and even radioactive waste to the “hole in the ozone layer”. Nuclear power plants were a matter of discussion in the household groups. People were divided about the risk factors associated with nuclear power and also about the issue of whether or not a solution for appropriate storing or recycling of nuclear waste would be found. The representatives of both SMEs and large companies were more clearly pro-nuclear: three

out of six SME representatives and 2 out of four large consumers interviewed stated that nuclear energy was their preferred fuel type.

In conclusion, the level of awareness of electricity supply in general and the environmental impacts of their electricity supply is low among Hungarian consumers. This situation is probably due to a number of reasons. One of these is that electricity supply has become a banality something automatic in the life of most Hungarian consumers, a given utility that nobody thinks about. Another reason for low awareness of the electricity supply¹ - that is also a finding of the research - is that the level of satisfaction with the present electricity supplier is high. Awareness of the environmental impacts of electricity supply is low, but we found that people were interested to find out more about this topic. Once the participants understood the labeling system many of them realized that this would give them a tool to influence the way electricity is produced, thus it would make demand-side management possible, at least in theory. So the reason for the low awareness is probably the lack of information rather than disinterest.

Consumer preferences in relation to information about electricity supply

Price and security of supply

When asked about their information needs for electricity supplier or product choice in a potentially liberalized market, participants were primarily interested in price. SME representatives also conveyed interest in technical information, such as security of supply, voltage and frequency. Information about customer service and country of origin were also mentioned. Although questions about source of energy, fuel mix and environmental indicators in most cases had to be directly asked, most people showed interest in this type of information later. Even those who were reluctant to discuss this information and at the beginning expressed that it was not their “business” at all, became gradually more and more interested. Although we were investigating preferences about the types of information that could be included on an electricity label, we also received a lot of input about information categories that are not likely to be included on the information label, such as price, price formation and details of customer service.

It can be stated that it is clearly the price advantage that is the most important factor in decision-making for both households and small businesses. The exceptions to this were a few people in the second household group who stated that they would be willing to pay a premium for green electricity, and large consumers for most of whom security of supply is the most important decision-making factor. Security of supply contains elements of both technical and commercial risk, and would be difficult to represent. The strongly preferred feature of price information would be a way of representation that would enable comparability across the various offers. Participants also raised a need for information on how the present price is formed. The expectations of high price volatility after the opening of the mar-

ket were discussed and some people affirmed a preference for a system of guarantees that the prices stated in an offer will remain the same or will vary only within a given limit during the contracted period.

Technical data, customer service, country of origin

Under the category of technical information are the voltage and frequency of electricity and the security of supply. These attributes were considered to be essential components of the electricity supply. People definitely wanted information about these parameters and also a kind of guarantee for these. Specifying the guaranteed maximum variance of these was perceived to represent this information well. In displaying the security of supply the guaranteed maximum length of blackouts was requested to be specified.

Customer service and country of origin are two additional types of information that would somewhat influence consumer choice. Customer service should be more easily reachable and therefore the telephone number should be displayed on the electricity label in a way that draws attention. Country of origin should also be displayed on the label typically to satisfy curiosity. Mostly the specific country did not seem to influence choice: people were only interested to know whether they are purchasing an imported or a domestic product. There was some disagreement about whether this information would matter in decision-making and, if so, then whether people should rather purchase domestic electricity and thereby boost domestic employment, or they should rather buy imported electricity and let the power plants pollute elsewhere than in Hungary.

Energy conservation, fuel-mix and environmental indicators

Participants in the household groups were genuinely interested in energy conservation and expressed their need to receive information and advice on this matter. This topic was the only environment-related one that came up by itself quite early in the discussions in the household focus groups, and people expressed that this would play a role in their choice of supplier. The preferred representation for energy conservation were tips about when to switch appliances on and off, which household appliances to buy and in general what to do to consume less energy. The issue of placing labels on stand-by appliances was also raised. Participants were aware that energy-conserving appliances may be more expensive but are worthwhile investments in the long term. People were very much in favor of energy conservation which was both a means to protect the environment and to reduce expenses: “*The most environmentally friendly energy is the energy that is not being produced*” (FGH2).

Next to all the information types described above, the environmental information was found to be of only second- or third-order importance to most of the consumers. Participants in all groups and also the interviewees said that they would be interested to receive this label, even though the importance of it to decision-making was not significant at the moment. Statements like “*I think there is no such person, who does not care about the environment*” (FGH1) and the way

1. Mainly Budapest residents were included in FG; non – Budapest residents may have different experience.

we live and make our choices has to change, because “*we are cutting the tree we are sitting on*” (FGH2) were made. These people felt that they are already having difficulty with paying their current electricity bill and unfortunately at the moment could not afford to pay a premium, but they also. The majority of participants were of the opinion that it was important to learn about and get accustomed to fuel-mix and environmental impact information and that in the future this will count more and more in choosing electricity supply. Two basic types of information were desirable, and these were fuel mix and emissions. In the focus groups many people felt at the beginning that information on environmental impacts should only be represented as a category on a scale going from low environmental impact to high environmental impact. The information available on a certain electricity supply should be evaluated according to various environmental criteria and than it should be rated in a category of environmental quality. As illustrations categories of restaurants and European car engines were brought up. Restaurants as well as cars are qualified in categories from worst quality category to best quality category according to a list of criteria, the details of which are unknown to us, nevertheless, we have a notion of these categories. In the same way electricity products could be categorized from most polluting to most environmental friendly according to a list of criteria. At further probing and display of the labels designed by the research team, it turned out that people were interested in the fuel mix information as well. The term “fuel mix” proved to be difficult to interpret for the participants in the pilot group, thus we used “energy source” instead in the rest of the research. The most widely suggested representation of origin was to have all the various energy sources in percentages; however, some people wanted to have the name of the power plant of origin on the label as well. Emissions were named as a possible environmental indicator, especially CO₂. Participants of the household groups were of the opinion that interpreting CO₂ emission information could cause problems, and people would surely have difficulty in interpreting the rest of the emission information. Nuclear waste and the hazards associated with nuclear power came up in the discussion, but no representation of this information was suggested. At the end of the focus group discussion when we have displayed the labels we designed we have shown a label that contained CO₂ emissions and nuclear waste produced by the specific fuel-mix purchased by the customer. The reaction to this label was mixed. Although people finally chose it as the best interpretation of environmental impact many have stated that these factors are not comparable and therefore the label does not carry the information they need (just % nuclear? Wondering where nuclear would go on the environmental impact scale given lack of emissions...).

Disclosure experiences elsewhere

Research results show differences among various countries with respect to awareness about electricity supply and factors of choice of electricity supplier. One of the important results of the focus group research on electricity disclosure

conducted in the USA was that “consumers wanted a large variety of information based upon which to choose their supplier”. However, price, service reliability, company track record, environmental record, customer service record and contract terms would be the most important criteria for choice (Holt, 1998). The results of the 4CE research in Great Britain show that price-advantage, the perceived stability and reliability of the supplying company and service levels were important factors in decision-making (Darby, 2002). In Sweden, price remains the most important factor of choice, but second most important factor would be that the electricity is from a renewable source (Arvidson, 2002). These findings are quite different from the findings in Hungary that most consumers wanted information on price and security of supply to make their decision and all the rest of the information would be of minor importance. Accordingly, awareness of electricity supply and environmental impacts of electricity was found to be relatively higher in the United States and Sweden, very varied in Great Britain and relatively lower in Hungary.

ATTITUDES OF HOUSEHOLD CONSUMERS

Household consumers' awareness about electricity supply

We found low awareness of electricity supply among householders. Although there were differences between the two groups, it can be stated that when the group discussion started most householders thought about electricity supply as a standardized product: “*I don't really know what else you could have on such an information label, because electricity is not as complicated and varied a product as food is, for example. You can have the voltage and the frequency, these two parameters, and even these will be the same in all cases, because electricity is a standardized product, this is what has to be supplied, everything that functions with electricity is manufactured such that it needs this quality (FGH1)*”. Householders knew the standard voltage and frequency of the electricity and considered these very important attributes of supply that one would not want to bargain about: “*I'm sorry, but with these things you cannot make a compromise, this has to be with all suppliers the same....*” (FGH2).

Liberalization, a new aspect of electricity supply, was poorly understood by the majority of the householders. The discussions on the issue of liberalization came up in both household groups at the first key question, when they were asked whether they would consider switching supplier in the future. Some people raised questions about how the switching would be possible at all, but in both groups there were one or two persons who explained to the rest of the people the mechanism of tracking²:

- “*It is very strange to imagine that my neighbour is going to buy his electricity from another supplier; I think this is impossible. It is impossible. [...]* (FGH1)

-*The construction of all this is not going to happen like, you have six suppliers and six wires come in to your house, you have one wire, and you choose who you are going to pay to.* (FGH1)

-*The thing that we are discussing here is in practice completely impossible, because you will have the same wire in your street. The*

2. The term was not used but the mechanism was explained.

Hungarian grid is all connected, you don't know whether you are using electricity from Paks³ or from Matra⁴. [...] (FGH2)

- It does not matter if the wire is the same, what matters is where the money goes. This is only a matter of accounting that will happen between the suppliers, what you can decide in this system is that you want to send your money to this one or to that one. Nothing else has to happen, no wire has to be connected or disconnected in your home". (FGH2)

Household consumers' factors of choice and information needs

Non-environment related factors of choice

The most obvious opportunity for product differentiation was considered to be the price of electricity. Participants expect that differentiation will be based on consumption patterns. All householders knew what their monthly electricity expenses were, but only some in the second group knew - and found it important to know - what the unit price of electricity was. Some participants in the first household group found the unit price of electricity to be an irrelevant information: *"The fact that I know or don't know what the kilowatt hour of electricity costs does not influence whether me and my family will sit at candle light in the evening or not."* (FGH1), and *"I am not going to watch television, thinking 'oops another 25 HUF are gone' for each unit of electricity"* (FGH1).

Householders had a relatively low price-sensitivity. A price advantage that would be large enough to justify switching to a new supplier was a cut in price, between 10% and 40%. Even though a price-cut would influence most participants to switch supplier some mentioned that it would not be worthwhile if switching would entail too much trouble.

Householders stated that they would like to know whether the electricity is imported or a Hungarian product, and that this information would influence their decision-making to some extent. In the household groups 12 out of 19 participants would prefer Hungarian electricity above imported electricity because this would help the Hungarian industry and would provide jobs to people. However, in both household groups the opposite was also favored, using the argument that imported electricity would keep the pollution sources faraway. *"I would add something to this, what have the big western companies done so far?, they brought their environmentally unfriendly technologies to us. I would say, let this (electricity generation) be done in the west, let them pollute there, and bring the clean electricity here. Wouldn't this be a better solution?"*(FGH2).

Environment-related aspects of electricity supply as factors of choice

Householders were genuinely interested in energy conservation, this was the only environment-related aspect that participants brought up in both household groups: *"besides, I would really appreciate if they would give me advice on what kind of household equipment to buy and when to switch them on and off in order to reduce my consumption"* (FGH1). From their present supplier, people do not receive this kind of information. Participants in household group 2 expressed their doubt whether

it could be expected at all from an electricity supplier to give such advice, since it would be against its interests: *"When energy markets will be open, then the interest of the supplier will be to sell as much electricity as possible. So what does he want - he wants to make money off us."*(FGH2). How this information could be represented on an electricity label was not clear, but participants in the second group suggested that e.g. warning labels should be placed on stand-by household appliances: *"Labels should be placed elsewhere, on the many stand by appliances, because if everybody thinks about it, you will realize, that you have in your home, at least three televisions, three video-players, 5 mobile phones plugged in non-stop, and the consumption of these is going on for 24 hours a day... If there would be a sign to draw the attention of people to unplug these things, turn them off manually, a lot could be saved. I took the time to measure, and there is such television that consumes 27 watt when turned off, nobody is watching it, the other one, the video consumes something in the range between 10 and 20 watt, and the third one the same, and when you start adding all these things together and calculating that it is a non-stop consumption,..."* (FGH2).

Environmental factors were considered by most householders a second or third order factor of choice. This issue had to be introduced in all groups by the moderator and in the interviews by the interviewer except for in household group 2: *"This may not be so important in Hungary today, but environmental indicators could be a part of the label"*(FGH2). In group 1 participants were surprised when the issue was introduced: *"Ten minutes ago before you first mentioned it [fuel mix], I never would have thought of fuel mix in relation to electricity consumption"* (FGH1). Even though the level of environmental awareness, with the exception of a few people, was low, household representatives proved to be the most environmentally sensitive ones among the investigated consumer groups, with 3 people in household group 2 stating that they would pay up to 15% more for green electricity.

Awareness of environmental impacts and fuel mix of electricity supply

The groups were able to name almost all fuel types, with the help of one or two knowledgeable participants who provided most of the information presented below. In this way opinions about the advantages and disadvantages of various fuel types were also expressed. A curious exception is oil: nobody mentioned oil as a source of electricity. Coal was considered to be bad, dirty and outdated. *"A lot will depend on how much material the press will publish on the issue that the coal is an outdated energy source, that it is polluting..."* (FGH1). Householders thought that the advantage of coal in Hungary was that it was still a cheap energy source. A few people mentioned that power plants pollute by emitting CO₂ and the knowledgeable ones also named other pollutants such as NO_x, SO₂, CO in both groups. Several people in the second household group connected burning of gas and CO₂ emissions to the hole in the ozone layer. Another participant quickly and politely corrected these by saying: *"Well I think that that is not so much related to the hole in the ozone but more to climate change and the greenhouse effect..."*(FGH2). Nuclear

3. Nuclear power plant in Hungary.

4. Gas power plant in Hungary.

energy was the most controversial topic. Overall people were more on the anti-nuclear side in the household groups. The advantage of nuclear energy was considered to be its efficiency, but problems were also raised: *"The problem with this is that it looks very nice in the short term, but in the long term we don't know where to put it [the waste]"* (FGH1) and *"My problem with nuclear power plants is that you have the human factor there. So there may come a moment when something happens that a person may not be able to handle, and then the consequences are disastrous. I have a horrible repulsion to nuclear power"* (FGH2). The rest of the traditional sources, such as gas and thermal were also considered to be polluting *"whenever you burn something you have emissions"* (FGH2), but no ranking was made among these in any of the household groups.

Almost all renewable sources were mentioned, these were named by a few knowledgeable participants. Although these were considered to be the best type of sources in terms of environmental friendliness, the concerns that they were too expensive and that Hungary does not have enough potential to develop them were also raised. Wind energy was among the first ones mentioned and also the one that was thought to have the most potential in Hungary. There was not much discussion about hydropower because it was thought that there was no potential for this in Hungary. The perceived shortcomings of solar energy were that it was extremely expensive and that it could only be used as a supplementary energy source, for example for the heating of water in households. Biomass and biogas were mentioned as fuels with some potential in Hungary. Geothermal energy was thought to have not much potential in Hungary by somebody in the first group: *"We have to forget about it, there is no potential for it in Hungary"* (FGH1)⁵. *Although not mentioned in the first group, methane gas was considered to be the best source available by two people in the second group.*

Preferred representation of fuel mix and environmental indicators

Information about fuel mix and environmental impacts were considered to be interesting and would be looked at even by those who will not use this information in decision-making. Fuel mix should be represented by percentage ratios of the different fuels. Instead of the term "renewable" the use of the terms "environmental-friendly" or "bio" was suggested, but most commonly people asked for a list of the most important renewable types as an explanation next to the term.

For environmental impact indicators, categories were suggested. *"If there is such a parameter called environmental friendliness, power plants could be put in categories, just like restaurants [...] Most people have no idea about the criteria based on which restaurants are put in a category. But in practice, one has a pretty good idea about what a first class restaurant is like"* (FGH1). For most people these categories were enough, but some participants mentioned emissions (CO₂, CO, NO_x, etc.) as good indicators. However, these indicators seemed to be potentially difficult to understand for many.

Participants wanted to be able to grasp the meaning of the environmental information, and therefore they came up with some further suggestions on visually appealing ways to represent it, or suggesting to link it to health impacts of pol-

lution to bring it closer to the consumer. One person in the first household group thought that a stripe like the ones they use on various types of margarine would be useful. The stripe on the margarine indicates how healthy the product is by showing its E contents, on the electricity label this could indicate how environmentally friendly the electricity product is. *"This [the stripe] is very easy to grasp, I immediately understood it. It would show me how much I consume, and the red part of the stripe shows how much I pollute."* (FGH1). In the pilot group an important information they wanted on the label were the health impacts, an explanation on how their choice translates into health risks, at least a description of this on the back of the label. The reason for this was that *"Health impacts are more palpable [than environmental impacts] to everybody, but even with these the problem with energy is that often there is no direct link between the consumer and the health impact"* (Pilot Group). One person in the first group made his own label in the collage exercise. He suggested using an explanation similar to the notion of ecological footprint to help consumers better understand the environmental impact. He included the following text next to the fuel mix information: *"During the period between the 3rd month of 2003 and the 4th month of 2003, so much grams of CO₂ were emitted to the air to generate the electricity you consumed, and in order to balance this x m² of green area would be needed"* (FGH1). These clever suggested ways of making the label more appealing are considered to lessen the objectivity of the label, which is a core requirement of labelling, therefore it is unlikely that the suggested representation of ideas will be used in the labels. These could be useful in the information campaign and promotion of labelling as such.

In summary, there was a relatively low awareness but high interest among householders in information about electricity supply. As compared to business representatives, households proved to be less sensitive. Other criteria, such as the ease of switching and energy conservation would be important to most of the focus group participants. There were a selected few among the household representatives who understood liberalization and tracking very well and were able to explain it to the rest of the people in the common language, without using the jargon of the electricity industry. The same selected few were also knowledgeable about the fuel mix and environmental impacts of electricity, however, generally the awareness about these issues were low.

ATTITUDES OF SMALL AND MEDIUM ENTERPRISES

SME representatives' awareness about electricity supply

We found low awareness of electricity supply among SME representatives and very limited understanding of liberalization. Five out of the six SMEs represented in the focus group discussion were electricity intensive businesses, and the participants were the ones knowledgeable in the company about electricity, thus it was a surprise for us to find such a low level of awareness. The security of supply, the quality and maintenance of the grid were mentioned as characteristics of electricity supply, but when probed about what other information they would need about their electricity supply,

5. Currently Hungary is the third in the world in generating geothermal energy.

a representative answer was: *“Aside from the voltage and capacity I don’t know what else is in it [electricity]...”* (FGSME). In this group, the questions regarding liberalization and how it could work in practice were posed several times, and the topic came up much later in the discussion than in the household focus groups: *“Europe has a grid, I just can’t understand how I am going to be able to separate off my power-plant from there. I don’t understand, I can’t imagine it”* (FGSME).

Factors of choice and information needs

The choice of electricity supply is more pronouncedly dependent on price in case of SMEs than in the case of households. All but one⁶ SME representatives were aware of the unit price of their electricity supply. SMEs proved to be a lot more price-sensitive than households. The minimum price advantage that would justify switching in this group ranged from 0.1% to 5%. The representation of information should allow for comparison across the offers. Even though switching would be determined by price, it would be a difficult decision to leave ELMU, the present supplier. Participants were very satisfied with ELMU services, including customer service and had decades of good relationship with this supplier, which would be difficult to rebuild. The additional services that would be relevant were increased flexibility in contracted capacities and increased hours of maintenance and repair works and information about these.

The issue of “import versus domestic” electricity was also of some importance in the decision-making of SME representatives. This group expressed a unanimous preference for Hungarian generators: if all other parameters were the same (price, technical data) then SME representatives would choose the Hungarian product. Although they stated that country of origin should be part of the information label, the specific country was indifferent to people as long as the listed qualities were guaranteed; however, there were comments stating that eastern products are generally less trustworthy than western products. *“The only problem with this is that with the Swiss one I am sure that it complies with it [the mentioned information categories] and with the Ukrainian one I am sure that it does not”* (FGSME). The rest of the issues did not come up by themselves and energy conservation was not mentioned at all.

When fuel mix was first introduced in the discussion by the moderator all but one participants stated that this would not matter in their choice of electricity supply and most of them also expressed their disinterest in this type of information. Statements like *“I am not in the least interested in this”*, or *“At the end of the wire I don’t feel where it [the electricity] comes from”*, or *“Why would I be interested in this [fuel mix]?”* (FGSME) were made. Even though all but one of them kept their viewpoint that fuel mix information and environmental information would not affect their choice of supply, after some discussion and having seen the designed labels they became more interested in the topic. One of them expressed the view that he would give more attention to these issues as a private person than as a business representative: *“Undoubtedly, I am less interested in this as a company representative, but as*

a private consumer I would be potentially interested in this. It is clear that all these sources except for some renewables are polluting” (FGSME). None of the participants in the SME group was willing to pay more for green electricity, and only two of them would choose the green product between two otherwise identical products with respect to the rest of the criteria. The reason quoted for this was high price sensitivity, but also disinterest: *“I think that a white crow is more ubiquitous than a company that would pay more for green electricity, and I have never seen a white crow”* and *“A little bit more expensive is a lot more expensive for a big consumer”* (FGSME). The issue whether SMEs would/could utilise information about using environmentally friendly electricity for PR purposes was probed. They mostly agreed that once they would procure green electricity, they would use this information in their PR, but were generally very sceptical about any revenues resulting from this.

The level of awareness about the sources of energy was a lot lower among SMEs than among householders. Only coal, gas, nuclear, wind, hydro and solar energy were mentioned as possible fuel types. Participants thought that all fuel types had negative environmental impacts, but that law regulated this, therefore no environmentally non-compliant power plant could possibly be generating electricity. Therefore this was not the consumer’s concern. One person objected to this by saying that the less environmental protection measures a power plant would comply with, the less money it would spend on the environmental measures, the less costs it would have, thus it would be able to produce the cheapest electricity. These polluting power plants will be the most price-competitive from the point of view of traders, so by choosing to consume the cheapest electricity you choose the worst polluter.

In discussions about the various fuel types and environmental impacts participants all agreed that all energy production is polluting in one way or another. Participants had very vague ideas about concrete environmental impacts, but the following impacts were mentioned: burning of coal results in CO₂ and NO_x emissions; nuclear power plants cause the formation of radioactive waste; hydropower that of wastewaters; and wind based power plants produce noise frequencies that harm animals. SME representatives were openly supportive of nuclear energy, 3 out of 6 would choose this even over green electricity if everything else in two products were held constant. Some participants in this group thought that hydro-power did have potential in Hungary.

When talking about how they would like to see fuel mix and environmental information represented, participants have repeatedly said that this type of information was not for them to receive, this was considered to be the business of policy-makers and environmental experts. If they were going to have this information then it should be the most simple and quickly understandable representation, since, as one participant stated: *“I work for a private company, I have to think twice whether I take the time to go out to the bathroom, let alone looking at such figures⁷, and comparing various offers. I would*

6. This business rented its office and did not pay their electricity bill directly.

7. Referring to figures one of the designed environmental indicator-labels displayed in the focus groups.

need an expert for this to explain it to me, and then maybe I still would not understand it" (FGSME). After having designed their preferred - in most cases simplified- labels, all SME representatives stated that they would look at this information but not use it in their decision-making.

ATTITUDES OF LARGE ELECTRICITY CONSUMERS

Large consumers' awareness about electricity supply

The large electricity consumers are the ones eligible to step out on the open market from the 1st of January 2003 and their electricity consumption is a very important factor. Due to these facts awareness of liberalization was highest in this segment of consumers. The interviewees were aware of the mechanisms of the open market; they have already had the experience of negotiating and looking at various offers from traders. They were all considering stepping out on the competitive market soon and switching to another supplier or to a portfolio of suppliers. A forum of managers and the managing director will typically make the choice of the electricity supply at least in the beginning until this task will become more of a routine, a commercial question.

Large consumers' factors of choice and information needs

The most important factors of choice will be the security of supply for all but one of the large consumers interviewed. (The consumer for whom price will be most important is connected to two different grids, therefore enjoys extra supply security.) Price advantages will come from the fact that, unlike the present supplier, traders will allow for a lot shorter planning time-spans for contracted electricity, as short as a week or even a day ahead instead of a year. Security of supply is very important because these large consumers cannot afford blackouts: *"in big factories with continuous operation and different product lines operating at the same time, even a few seconds of blackout can cause very serious damage"* (Interview 1). Security of supply is meant both in the technical and commercial meaning of the word.

Aside from these two major factors the *"mentality"* of the trader was mentioned by several interviewees: *"how well can the trader follow the changes in our demand, how well can he guess our thoughts, ... that the contract is made with the least possible legal remedies and punishments but that, is rather based on a spirit of cooperation"* (Interview 1). Other additional mentioned factors were:

- The quality of electricity, meaning that the standard frequency and voltage is supplied with limited variation.
- How the power is metered.
- Who meters it?
- Who provides the software/hardware?
- The method of payment.
- Availability of all levels of frequency.
- Continued information about the system.

The level of satisfaction with regard to all the mentioned factors was high with the present supplier. The only problems one interviewee raised was with respect to the method of payment and the timing of payment: *"Currently we have to*

pay in advance for the contracted capacities and the overcapacities are taken off the account within three days, which does not suit typical business financial cycles" (Interview 3). He also stated that the supplier treats them as an authority in this respect, rather than a supplier with a client.

When asked about fuel mix and environmental indicators, large industries said that these do not count in their choice of electricity supply at the present and in the short run. The reason for this was that they did not see market mechanisms that would reward this, not even in sales in the west. When asked about possible market mechanisms one person thought about introducing a "produced with green electricity" logo for products: *"Producers reusing secondary raw materials put a logo on their products that informs the end-consumer as well that the product is the result of an environmentally protecting activity. Likewise, with energy as a product, if this would work and the consumer would recognize it, a logo could be used certifying that green electricity was used for the making of the product; then the producers would also happily use it. However, these mechanisms do not work in Hungary"* (Interviewee 3). The interviewee refers to the fact that in his experience he has found that there is very little awareness and demand for green products among customers. In the short run if green electricity would be bought at all, then it would be rather a result of the demand of the shareholders and stock market than that of end-users. Two more optimistic interviewees said that perhaps if all other parameters are constant, they may choose an environmentally more friendly power source. One of these would do so in order to use the information in PR, the other considered such a situation too hypothetical. Several of the interviewees was very supportive of nuclear energy and called it green, and also stated referring to nuclear power that it is *"perhaps a lucky situation is that cheap electricity is also the more environmental friendly one"* (Interview 3). Renewables were named as the only type of fuel that is positively valued by the general public.

All interviewees voted for a command-and-control type of support of renewables and the environmental impacts of electricity generation. This may be the result of the relatively new market conditions in general; this also may be due to unfamiliarity with market-based environmental policy mechanisms and their potential effectiveness. It is also important to keep in mind that most interviewees belong to the older generation who worked most of their active careers during the centrally planned economy, and thus were trained in command-and-control mechanisms. When a newer, younger generation will take over in the management positions of these large companies and energy industries, market-based support mechanisms for environment will probably be received by a more open-minded corporate elite, and thus will likely be supported to a higher extent.

Since it was so obvious during the interviews that these people have not been thinking about fuel mix and environmental impact information at all, it became almost impossible to ask questions about the ways in which they would like this information to be represented. So far all market participants have been too occupied by the hows and the whens of market opening and the basics required all their attention, and thus any potential environmental considerations are currently not on the companies' maps, even in the case of environmentally more conscious corporations.

Recommendations

IMPLICATIONS FOR THE DESIGN OF DISCLOSURE POLICY

For the time being in Hungary, the big majority of consumers are not going to base their decision on fuel mix and environmental impact indicators information. The household segment showed the most interest in this information: three people expressed willingness to pay a premium for green electricity. Many householders were of the opinion that environment is a very important and increasingly important consideration for everybody and it should be a priority to protect it. For these people, information on energy conservation would play a role in their decision-making. In the household segment there were also a few people who did not care about the environment, and thus would not be influenced by this kind of information, even though they stated that they would look at it out of curiosity.

SMEs in Hungary do not think this information is of interest to the company, they cannot afford to spend time on reading such information, it is not going to influence their choices. It seems that SMEs are further away from being interested, aware of and making choices based on fuel mix and environmental impacts of their electricity supply than the general public. Nevertheless, SME representatives also stated that they would look at the label, e.g. some of them mentioned that they would be interested in the trend of the developments of fuel mix. Large consumers showed more interest towards disclosure. They also identified market mechanisms that could reward the choice of greener electricity in the future, such as customer, shareholder and stock market expectations.

Given the present market constraints, the non-availability of green products, the lack of traditions in electricity procurement, and thus environmental traditions in electricity procurement, it is unlikely that disclosure will have any impact on supply in the short run. One of the interviewees summarized the impact of disclosure in the following way: *“first the label will end up in the dustbin. Later, the consumer will take a look at it. In a few years, they may use its contents for decision-making”* (interview 1). So far all consumer segments were positive about the educational and informational role of disclosure in Hungary, and welcomed it. Therefore disclosure will have an important role of consumer education in the short run, and when a higher environmental awareness is reached among consumers and businesses, an impact on supply choice decision is also likely. In summary, while at present there is no urge from the side of consumers towards disclosure, it will fill an important niche and is expected to have implications in the long term.

Recommendations

Recommendations by all consumer segments were made on the need of stressing the importance of the educational aspect of disclosure and its effect of enhancing transparency of the electricity industry and market. For this purpose the introduction of background information was suggested in various channels and forms. For Hungary, a communication channel that would stimulate awareness raising effect of the disclosure would be appropriate, with special clauses on making extra information available on request (on line infor-

mation, phone, information office), obliging suppliers to employ well-trained staff and experts to answer information requests, facilitating media coverage of the disclosure at the time of implementing the policy.

IMPLICATIONS FOR LABEL DESIGN AND CONTEXT

The following attributes of an information label were the most preferred by the consumers: simplicity, clarity, ease of perception and visual appeal. Upon probing we also found that reference to both fuel mix and environmental information were preferred. *“For me diagrams are very important, because if a label contains too much text in small-font size, I don’t always have the time to read it through. With a diagram, I look at it in two minutes”* (FGH1), *“This seems simpler to me, if I want to know more, there is a telephone number that I can always call”* (FGH1), *“I chose the two simplest diagrams. You have the fuel mix here and you can also see how much it is damaging the environment. I find that this is the simplest way to put it, maybe the other labels are more complicated, but they say the same thing”* (FGH2), *“I think if there is too much information on a label, then it is more difficult to notice the essential things. This is only the essence”* (FGH2).

The best way to catch the attention and interest of the people seemed to be a collage exercise, because it was interactive. Therefore an interactive way of approaching the larger public with the same information could be useful in awareness raising. Further recommendations on the design of the label are:

- Pie charts are a good idea for presenting fuel mix information, percentages and pie-charts showing electricity product fuel mix.
- A more straightforward indication of which product is better and which is worse for the environment may be better than complicated information on emissions and other environmental indicators.
- In general, it is a good idea to avoid representing concrete figures of indicators. Percentages or some kind of categorization should rather be used.
- Whenever possible display national average, EU average and perhaps legal environmental thresholds for environmental impact indicators as references.
- The context of information is very important: the label should not be used by itself, but should be part of the bill or the information package of the offer or more offers to choose from. Consumers agreed that an eye-catching wrapping of the label would be useful. It was suggested that colourful information folders, pictures and information on price reductions or some other buzzer sentence should accompany the label.

Conclusion

There is no pressing urge among consumers to switch electricity supply. One reason for this could be the high level of satisfaction with the present electricity supplier among Hungarian consumers. Even the people who had complaints about the customer service of the present supplier were satisfied with the two features of electricity supply perceived as most important: price and security of supply. Another reason named by several people was that before switching they

would have to get acquainted with the liberalized market, the offers and the new suppliers. The novelty of liberalization may be an explanation to the conclusion that there is low understanding of liberalization of electricity market and low awareness of electricity supply among Hungarian consumers. However, it is an important finding that there is interest in liberalization and information disclosure and almost all consumers would consider switching.

Consumers want, first of all, information on price and security of supply to aid them in choosing their supplier. Other types of information that consumers would be interested in but would use in a very limited way in their decision-making were technical data, import versus domestic, quality of electricity and customer service. Consumers, especially householders, expect energy efficiency advice from their ideal supplier. Consumers have difficulty linking fuel mix and environmental impact of generation to electricity and there is limited understanding of environmental impacts, but they would look at this type of information. Especially the understanding of the link between electricity and climate change was low. The large majority of interviewees and focus group participants stated that they would look at fuel mix and environmental impact information.

It is not expected that the impact of the disclosure of electricity related information will be that everybody in Hungary will start buying low carbon and green electricity right away. However, it is clear that it will contribute to gradually increasing awareness and educate consumers about the existing fuel types and their environmental impacts. Consumers will be provided with a tool to link their electricity supply with energy generation, providing new and interesting information both about their electricity supply and the electricity market. Most research participants expected that after several years the provided information may influence the choice of electricity product or supplier. Disclosure may also have a demand-reducing impact: it was voiced that if people become more aware of the environmental implications of their electricity supply they may become more conscious in "turning the light off".

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