

The need to heed the changing structure of household consumption, not only technical energy efficiency – the Finnish case

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1 - SYNOPSIS

The paper describes some examples of structural changes in consumption which have increased, or will increase, energy consumption and counteract the improving of technical energy efficiency.

2 - ABSTRACT

The energy saving accomplished with new technology has not been enough to compensate for the expansion of consumption in Finland any more than in most other industrialised countries. Because the focus has been on technical energy efficiency, there has been no need for energy saving policies to take a clear stand in respect of changes in lifestyles, i.e. structural changes in consumption. These changes are often "creeping" ones, so that even major changes to what is considered as "normal" way of life, go easily unnoticed.

The paper describes some structural changes which have already influenced, or are anticipated to influence, the energy consumption of Finnish households and which counteract the improving of technical energy efficiency. The examples comprise growing number of small households, expansion in the dwelling area, increase in the number of large electrical appliances in small households, growing number of electric saunas, holiday homes becoming common and developing into second dwellings and increased mobility by road and tourism.

The latter part of the paper presents some survey findings about Finnish household consumers' energy consciousness, in which there are still major deficiencies. The energy saving measures taken by households are modest compared to the increase in the consumption. The paper also raises the question whether too much is expected of the environmentally better informed younger generations who, as a counterpoint, may take the "normal" way of life of today even more for granted than the older ones. At the very end of the paper, some too little discussed challenges to energy politics are highlighted briefly.

3 - EXPANSION OF CONSUMPTION

In the 1980s and 1990s, energy saving policies have mainly focused on increasing technical energy efficiency. Energy saving technologies have, indeed, developed significantly and specific consumptions, e.g. energy consumed to heat a square metre of dwelling, or kilowatt-hours consumed for a load of laundry, have decreased. Yet, the new technologies have not spread according to expectations, and the growth in the demand for energy-intensive products and services has totally contradicted expectations. In the end, the energy saving accomplished with new technology has not been enough to compensate for the expansion of consumption in Finland any more than in most other industrialised countries. (Goldemberg et al. 1988, Statistics Finland 1998c). The development is aptly described by the work of Schipper and associates on energy indicators, which charted out the changes that have taken place in a number of countries by separating the development of energy efficiency from other structural changes in society¹.

Traditionally, policies targeted towards energy saving have only examined as households' energy consumption the amount of energy actually bought by the households, in other words the end consumption of energy in a dwelling and in running a car. The energy consumed in the production and transportation of the products and services used by households has, until recently, been excluded from the examination. In Finland, for example, where the climate is cold and distances vast, only 46 per cent of the households' total energy consumption was direct energy consumption, while this frequently forgotten indirect energy consumption made up 55 per cent of it in 1990 (Nurmela 1996).

Because the focus has been on technical energy efficiency, there has been no need for energy saving policies to take a clear stand in respect of changes in lifestyles, in other words structural changes in consumption. These changes are often "creeping" ones, so that even major changes to what is considered as "normal" everyday way of life, go easily unnoticed - not only by lay people but probably also by many experts. As a consequence, it has been easy to look upon today's consumption habits as self-evident facts, with no history. On the other hand, how many fully realise that a continuous annual growth rate of 2.5 per cent in something, like the GDP, means that the same something will have doubled in as little as thirty years in the future? In any case, the challenges of climate politics force us to take a longer-term look at the social changes which influence energy consumption.

The paper does not go further into the important questions on the social dynamics of the expansion of consumption (see e.g. Shove & Warde 1997). Instead, the next part of the paper only describes some structural changes which have already influenced, or are anticipated to influence, the energy consumption of Finnish households. The examples here apply mainly for the direct energy use of households. Economic developments may well produce similar changes in countries in southern and eastern Europe, for example, although due to cultural differences they are also likely to take on their own special characteristics. The latter part of this paper presents some survey findings about Finnish household consumers' energy consciousness, in which there are still major deficiencies. The concluding part highlights briefly some new challenges to energy politics that have been studied and discussed too little, so far.

As background information for the reader, Finland is a Nordic Country with a population of five million. In the 1960s, Finland developed fast from an agrarian society into a modern industrialised country. Finland is an affluent, Nordic welfare state where also women command a relatively strong position in society. Finland joined the European Union in 1995.

4 - CREEPING STRUCTURAL CHANGES

4.1. Growing number of small households

The size and structure of the population and households influence energy consumption fundamentally. Changes in the total size of the Finnish population have, so far, been minor and no major future changes are forecast, either. However, the size of the Finnish household has become smaller. The number of 1- and 2-person households is expected to continue growing rapidly, which means that the total number of households will increase by a quarter, or by half a million, from the present good two million, by the year 2020 (Nurmela 1996) (Figure 1). The numbers of both elderly and young people able to live independently are increasing. The speed of the change is influenced by economic development and, especially, by the opportunities it creates for young people to have their own dwellings.

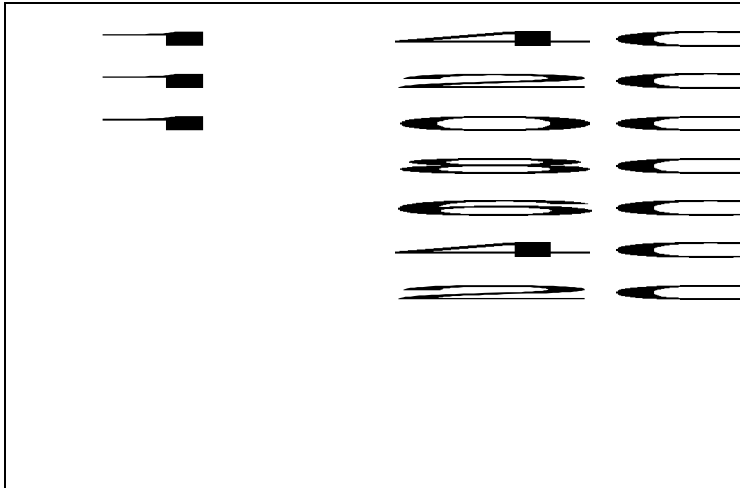


Figure 1 : Estimated number of households by size in Finland, 1966-2015

4.2. Standard of living has improved

Over the past few decades, housing has grown considerably more spacious in Finland. Heated living floor area per person has more than doubled between 1960 and 1995 and is expected to grow by a further 40 per cent by 2025 (Kauppa- ja teollisuusministeriö 1997). The aforementioned reduction in the size and increase in the number of households are factors which contribute to this growth of living floor area as well as the increased spaciousness of the dwellings. (Figure 2)

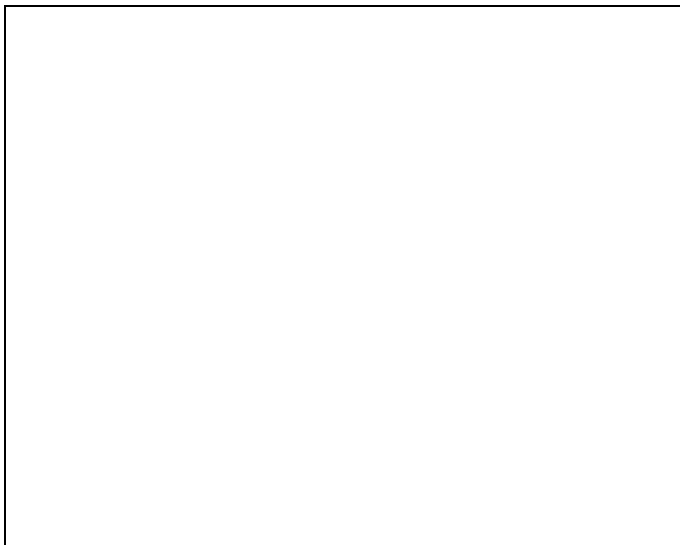


Figure 2: Dwelling area per person in Finland, 1960-1995, and estimate for 2025

The technical ease of central heating combined with reduced financial constraints have also made it possible to raise room temperatures and increase water consumption. Behind the averages that are considered as reasonable are vast differences between individual households. In a quarter of dwellings in blocks of flats, and even in ten per cent of detached houses, the indoor temperature was at least 23°C in the sub-zero temperature period of 1996 (Melasniemi-Uutela 1996b). Many-fold differences were found in the water consumption calculated per person (Melasniemi-Uutela 1992 and 1995)².

4.3. Large electrical appliances become common in small households

The consumption of electricity for domestic appliances, home entertainment equipment and lighting³ has quadrupled in Finland since 1970 (Statistics Finland 1998). In the background of this is the very rapid increase of electrical appliances in households over the past decades (figure 3). The fact that large appliances, e.g. freezer, washing machine and dishwasher, which were traditionally only purchased by large households are rapidly getting common even in the growing number of small households (Figure 4). Thus, even if saturation level were soon to be reached in respect of ownership of large appliances by large households, the number of appliances would still continue to grow and their efficiency ratio per person would fall⁴.

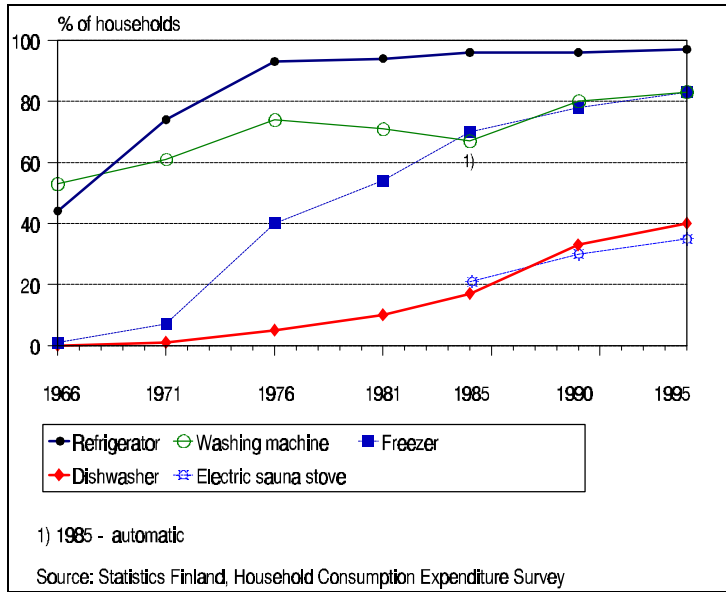


Figure 3: Ownership of some electrical appliances in Finland, 1966-1995

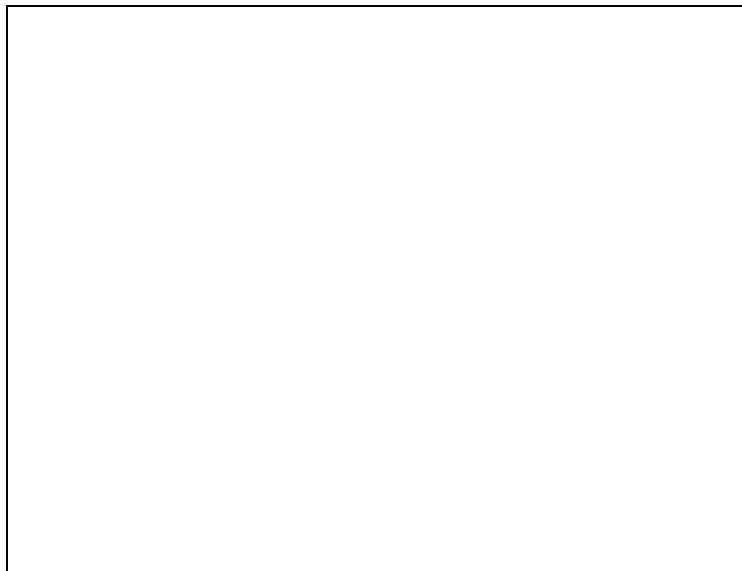


Figure 4: Ownership of some electrical appliances by one-person households and households of couples without children in Finland, 1966-1995

4.4. Own electric saunas common even in flats

A sauna heated by a wood-burning stove has traditionally always belonged to the Finnish way of life in the countryside and in holiday homes. Today, own, electrically heated saunas in individual dwellings have spread in popularity from detached and terraced houses to new dwellings in blocks of flats. By the mid-1990s, over one third of Finnish households had their own electric sauna (Figure 3). In 1993, saunas consumed more electricity than washing laundry and machine dishwashing put together (Suomen Sähkölaitosyhdistys 1995).

4.5. Every fourth Finnish household has a holiday home

Holiday homes are also an essential element of the Finnish way of life. Today, they number almost two and a half times as many as in 1970. In 1995, every fourth Finnish household owned a holiday home, either alone or jointly with another household (Statistics Finland, Household Consumption Expenditure Survey 1995) and the growth in the number of holiday homes is expected to continue. (Figure 5).

Traditionally, holiday homes were used during summer and heated with wood, if necessary. By 1995, over one half of the holiday homes were already electrified and almost half of them were fit for year-round living (Statistics Finland, Household Consumption Expenditure Survey 1995). In 1997, holiday homes located outside the municipality of domicile were used for 90 days per year, on average. The owners want to continue improving the equipment levels of their holiday homes to increase their year-round use. For many Finns, especially pensioners, holiday homes are developing into second dwellings (Mäntylä et al. 1998 and Kotilainen 1998).



Figure 5: Number of private holiday homes in Finland, 1970-1997, and estimate for 2010

4.6. Increased mobility by road and air

While fewer than one third of Finnish households had a car in 1966, by 1995 the proportion had gone up to two thirds of all households, and one household in six had at least two cars. The private car had become even the small households' travelling medium. (Figure 6)

Between 1975 and 1996, the person-kilometres travelled by car increased by over 60 per cent and the growth is expected to continue. The car is used a lot for leisure travelling. Travelling to the venue of the activity forms a major part of the total energy consumption in many leisure activities, such as going for a stay at a holiday home, skiing at a ski slope or swimming in a swimming hall or to watch ice-hockey matches (Mäntylä et al. 1996).



Figure 6: Car ownership of all households, one-person households and households of couples without children in Finland, 1966-95

Finnish air tourism increased especially rapidly in the 1980s. In 1990, over one quarter of all Finns went on a package holiday abroad by air. The economic recession cut back tourism in the early 1990s but since then its volume has returned almost to the peak level of 1990. (Figure 7)



Figure 7: Package tours abroad by air from Finland, 1965-1997

5 - FINNS' ENERGY CONSCIOUSNESS STILL HAS DEFICIENCIES

Clearly, household consumers' positive attitudes towards the conservation of energy and the environment do not convert into actions. Quite obviously, people either do not question the present, "normal" lifestyle at all, or do not see that taking the initiative to divert from it is their personal responsibility.

According to surveys, wasting of energy was considered unacceptable but, then again, very few felt they themselves were wasting it. Exceptionally high consumption was deemed as wasting, but own high consumption was not necessarily recognised (Kiljunen 1994 and Melasniemi-Uutela 1993a). Nearly one half of the Finns who responded

to the 1993 survey knew nobody who was trying to save energy in earnest (Kiljunen 1994). In 1996, nearly 80 per cent thought they personally had saved energy during the last couple of years, but less than one half thought they had done it in respect of many things. One quarter of the persons who themselves drove a car made no efforts to limit the use of the car in their leisure time (Melasniemi-Uutela 1996).

Although people express concern about the greenhouse effect, only one half of the respondents of the 1994 survey identified the production and consumption of energy as its main causes (Heiskanen & Timonen 1995). In Finland, wrong impressions have also been created by the reductions achieved with new technologies in the emissions of local air pollutants from power stations, industry and motoring. In 1996, only one fifth of those interviewed knew that the newest fuel grades and catalytic converters do not eliminate those emissions from motoring which cause global warming (Melasniemi-Uutela 1996).

Because households' energy saving has generally been associated with the consumption of energy for living and motoring, very few come to think about the "accumulated" energy in products and services when they make purchase decisions. A vast majority of the Finns holidaying abroad, for example, are relatively unaware of the fact that flying consumes a huge amount of energy. Yet, a return flight of a Finnish family of four to the Canary Islands equals 40 per cent of the oil consumption required to heat an oil-heated detached house and its utility hot water for a year.

In Finland, public debate about energy has mainly focused on energy production methods: should the required additional energy be produced with nuclear power, coal, gas or renewable sources of energy, such as wood and wind power. In national politics and economy, energy conservation is not given a high priority. Neither has the relatively low price of energy encouraged consumers for whom saving money has been the main practical motive for conserving energy (Melasniemi-Uutela 1994)⁵.

Against the background described above, it is not very surprising that the ordinary consumer has neither felt that his or her own energy saving input would make an impact on the end result, nor that it is his or her personal responsibility to actively start changing the customary habits and ways connected with, and adding to the comfort of, our "normal" way of life.

5.1. Is too much expected of the young?

The above described "creeping" changes which have taken place over a fairly long time period illustrate how the structure of consumption considered as "normal" has been changing. Middle-aged and older people have lived through this change, but the youngest generations have grown up in an environment where high indoor temperatures, copious water consumption, travelling by car, holidays in the sun and short product lives are almost the status quo. So, the differences between age groups in Table 1 may indicate cohort effects. (Table 1)

It is possible that the expectations placed on the young to change the direction of the development are excessive. It is true that the young have received more information about environmental conservation than their parents, but they may also find it more difficult than their parents to give up the energy-intensive "normal" habits of today.

Table 1. Attitudes to certain statements concerning energy consumption and conservation by age group, 1993. Proportions of those agreeing. (10 to 24-year-olds, N=186; 35 to 59-year-olds, N=840)

	18 to 24-year-olds %	35 to 59-year-olds %
Room temperatures have gone up unnecessarily high today	51	68
Clothes are washed more often today than really necessary	47	64
Most people could manage washing themselves with less water	74	85
People should have fewer holidays in the sun to save energy	23	44

Source: Melasniemi-Uutela 1993b

5.2. Fresh 1999 opinion poll about households' energy saving

Fresh findings are available about the above topics from an interview inquiry carried out in Finland in February-March 1999. However, due to the production schedule of the relevant publication, these will regrettably only be available for presenting orally at the ECEEE Conference. The survey, implemented as telephone interviews, was based on a sample of 1,800 persons aged between 18 and 74. The survey was carried out at Statistics Finland and commissioned by the Finnish Ministry of Trade and Industry.

6 - CONCLUSIONS CONCERNING ENERGY CONSERVATION POLICIES

6.1. Technology alone is not enough

In general, Finnish citizens are more confident than those of other industrial countries that environmental problems will be solved by science and technology (Tanskanen 1997). However, structural changes in consumption reveal the recklessness of this faith in technology. If consumption choices can change totally freely without any debate about the possible consequences, there is a danger that the development of the last two decades will repeat itself: Despite its advances, technology alone will not be enough to counterbalance the continually growing consumption. Even very successful energy saving will not bring the desired overall results if a saving accomplished in one place simply transfers into consumption in another through the so-called rebound effect (e.g. Pearce 1998).

Quite obviously energy conservation policies should examine social changes more extensively than before and also consider those choices of lifestyle and ways of saving energy which limit energy consumption and emissions as a whole. Energy saving should be given consistent attention by the different sectors of social politics right from the very early stage when they set their own objectives.

6.2. What can be expected from the consumer?

In Finland - as also elsewhere, in general - there has been growing desire to leave the responsibility for directing social development to market forces. The assumption has prevailed that, with their choices, energy-conscious consumers will guide the markets towards greater energy efficiency (Hallituksen energiansäästöohjelma 1992). Against the background described above, it would seem unreasonable to leave the responsibility for energy conservation to ordinary, individual citizens.

The households' difficulties in responding to energy saving challenges are understandable. Many physical structures influencing energy consumption, like the relatively young building stock in Finland, routines of today's lifestyles, and social norms cannot be changed quickly. Therefore, it is important to avoid placing on people excessive blame, which might lead to undesired counter reactions (e.g. Massa 1998). Energy-intensive habits have not evolved from irresponsible attitudes but from the important motives of wanting to safeguard one's own, or one's family's, welfare with the means that are available.

We expect our welfare to improve even further in the future, which we assume will also require steady growth from our GDP. As regards changes in energy consumption, the essential question - which also touches the ordinary consumer - is how households are going to use their higher incomes. As far as energy consumption and its adverse effects are concerned, both good and bad alternatives are on offer.

Although it is essential to develop energy saving methods which apportion responsibility evenly to all sectors of society⁶, it does not mean that the role of the household will become less important in the realisation of energy conservation. The role of household consumers is pivotal as the endorsers - as well as the demanders - of policy level decisions in support of energy conservation. Democratic acceptance of social measures, such as energy tax increases and the imposition of divers restrictions, constitutes a major challenge to the dialogue between political decision makers and ordinary citizens.

Longer-term challenges include finding totally different ways of consuming and organising activities, in other words keeping the everyday life flowing smoothly, enjoying variety, experiencing new things, receiving social acceptance, etc., while consuming less energy. In other words, *besides technical energy efficiency*, energy consumption also needs improved *institutional and cultural energy efficiency* (Kempton et al. 1994).

Although it may create feelings of guilt, increasing of general knowledge about the connections between households' choices and energy consumption, as well as its adverse effects, is, nevertheless, vital for many reasons.

7 - ACKNOWLEDGEMENTS

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9 - ENDNOTES

- (1) Schipper and associates (IEA 1997) analysed the trends in energy consumption of several industrial societies by dividing the changes in total energy consumption of different end use sectors (travel, freight, households and services, as well as industry and manufacturing) into impacts of changes in activity, structure and energy efficiency. Their work showed that structural changes accounted for significant changes in energy use - more often increases than decreases. However, they only included in the household sector consumption the energy used for living, i.e. heating of buildings and utility water, cooking and electrical appliances. The rest of households' direct and indirect energy consumption was included in the sectors of transport, manufacturing and services.
- (2) In 1996, the average indoor temperature was approximately 21°C in detached houses and 21.5°C in dwellings in blocks of flats. Despite the widespread utilisation of water-saving technology, in 1995 the average amount of water consumed per person per day was 170 litres in dwellings in blocks of flats (Statistics Finland 1996) and approximately 130 litres in detached houses.
- (3) Electricity sold to households excluding electricity for heating (as the principle source of heat).
- (4) The fact that the percentual proportions of owners of certain appliances remain unchanged as households grow smaller means that the absolute quantities of these appliances increase.
- (5) In 1997, the consumer price of electricity for households was 0.09 EUR / kWh in Finland. The corresponding price was 0,09 EUR in Sweden, 0.12 EUR in the Netherlands, 0.13 EUR in France, 0.16 EUR in Germany, 0.16 EUR in Denmark and 0.22 EUR in Italy (Statistics Finland 1998c)
- (6) In environmental policy debates, "sustainable development", i.e. development which does not endanger the living conditions of future generations, has been joined by new catchwords like "eco-efficiency", "Factor Four", and "Factor Ten", meaning producing more from less (Weizsäcker et al. 1997). Although, for the moment, the questions is only about broad, long-term outlines and the above catchwords hide many questionable assumptions, the debate does at least prove that search has been started for a way out of the present vicious circle.