

Shifting attitudes towards energy efficiency in Europe?

Dominic Stead
Senior Research Fellow
OTB Research Institute for Housing, Urban and Mobility Studies
Delft University of Technology
PO Box 5030
2600 GA Delft
THE NETHERLANDS
d.stead@otb.tudelft.nl

Keywords

attitudes, energy efficiency, Europe, temporal trends, socio-economic factors, Eurobarometer surveys

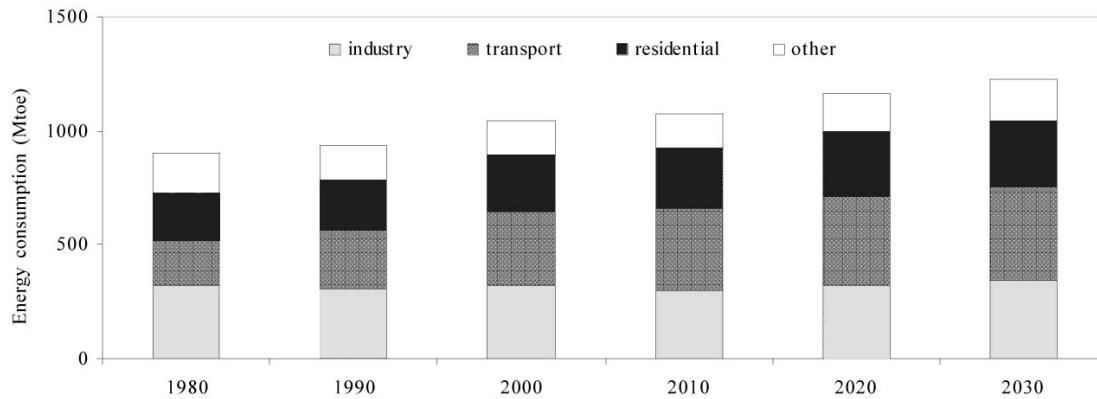
Abstract

Special Eurobarometer surveys are carried out regularly in all European member states on behalf of the European Commission. These surveys concern a range of subjects (recent topics include the environment, health, biotechnology, discrimination, the Common Agricultural Policy and European integration). Each survey consists of approximately 1 000 face-to-face interviews per country, with the exception of Germany (2 000 interviews), Luxembourg (600 interviews) and the United Kingdom (1300 interviews, including 300 in Northern Ireland). From time to time, the Special Eurobarometer surveys focus on energy related issues. This paper draws on three such Special Eurobarometer surveys from 1984, 1993 and 2002 in order to examine temporal trends in individual actions and intentions concerning energy efficiency across Europe. The main focus of the paper is on broad energy efficiency measures (such as home insulation, heating reduction, home-appliance use reduction and car use reduction) and the differences in stated actions and intentions over time and between countries. It examines whether actions and intentions differ according to age, gender and education, and whether these differences are stable over time (between 1984, 1993 and 2002). Data from the 2002 Eurobarometer survey are also used to explore the level of public support for different types of energy efficiency instruments such as taxes, regulations, information campaigns and financial incentives.

Introduction

The European Union is one of the largest energy consuming regions in the world (European Commission, 2002). In 2002, the 15 Member States of the European Union at that time consumed around 1 057 Mtoe – approximately 15% of the world's energy consumption (European Commission/Eurostat, 2004). Over recent decades, energy consumption in the European Union has increased at a slower rate than the growth of GDP but nevertheless has continued to grow. Between 1985 and 1990, the GDP of the EU15 grew by 37%, whilst energy consumption of the EU15 increased by 16% over the same period (European Commission, 2002). Total energy consumption in the European union is set to rise further over the next few decades: between 2000 and 2030, the total energy consumption of the EU15 is forecast to increase by 17%, reaching 1 229 Mtoe by 2030 (European Commission, 2003).

Just as energy consumption varies across different countries within Europe, energy consumption also varies across different sectors or end-users. Across the EU15 in 2000, 31% of all energy was consumed by industry, 30% by transport and 24% by the residential sector (Figure 1). Twenty years earlier in the EU15, 35% of all energy was consumed by industry, 22% by transport and 23% by the residential sector. Thus, the proportion of total energy consumed by industry declined between 1980 and 2000, whilst the proportion of energy consumed by transport increased. This trend is also forecast to continue into the future (European Commission, 2003). By 2030, it is estimated that 28% of all energy consumed in the EU15 will be consumed by industry, 33% by transport and 24% by the residential sector.



source: European Commission, 2003.

Figure 1. Energy consumption by sector in EU15 between 1980 and 2000, and projections to 2030
Note. 'Other' includes energy uses such as agriculture, commerce and public services.

In terms of absolute levels of consumption, there was virtually no net change in industrial energy consumption across the EU15 between 1980 and 2000, whilst energy consumption in the residential sector increased by 26% and by 61% in the transport sector (Figure 1). Forecasts to 2030 suggest that energy consumption in Europe will increase in all these major sectors. Industrial energy consumption is forecast to grow (albeit moderately) beyond 2010, consuming 7% more energy in 2030 than in 2000 (European Commission, 2003). Transport energy consumption is forecast to increase by 28% between 2000 and 2030 and residential energy consumption is set to grow by 14% over the same period (*ibid*).

The recent trends in industrial energy consumption are due to a combination of factors including the growth in industrial production, greater energy efficiency (within some sectors) and industrial restructuring (and re-location). Rapid increases in the transport sector, substantially faster than the rate of growth of GDP in the last decade or so, are the consequence of factors such as longer travel distances (for both freight and passengers), more vehicles and the rapid increase in air transport, due in part to the liberalisation of the air transport market.¹ Increases in residential energy use are due to factors such as the increased number and use of electrical appliances, the decrease in household size (and thus the growth in the number of households) and the increased use of air conditioning in southern countries.

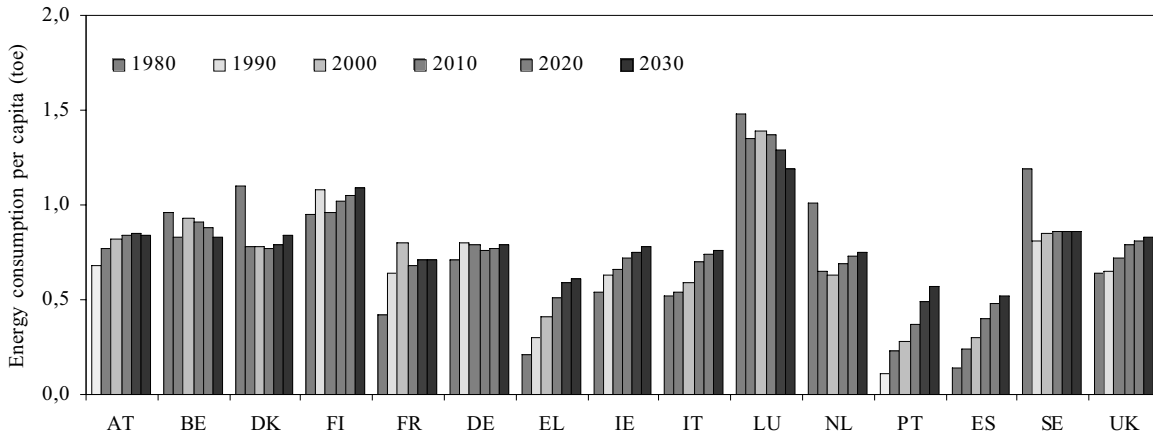
Within Member States, energy consumption patterns are often quite different from each other as a consequence of various factors such as climate, industrial base, income and development. In terms of residential energy consumption, a number of different trends are apparent in different countries (Figure 2). Some countries experienced substantial decreases in residential energy consumption per capita between 1980 and 2000 (e.g. Denmark, the Netherlands and Sweden, notably between 1980 and 1990), whilst others experienced substantial increases (e.g. France, Portugal and Spain). Forecasts suggest a growth in residential energy consumption per capita by 11% between 2000 and 2030 for the

EU15 as a whole but consumption is not expected to grow in all countries (European Commission, 2003). Residential energy consumption per capita in Belgium and Sweden, for example, is expected to decrease between 2000 and 2030, whereas residential energy consumption per capita in Portugal and Spain is forecast to grow by 84% and 48% respectively over this period (European Commission, 2003).

Transport energy consumption per capita more than doubled in some Member States between 1980 and 2000, mainly in the countries where transport energy consumption was lower than average (e.g. Greece, Ireland, Italy, Portugal and Spain), but increased much more moderately in other countries, mainly where transport energy consumption was higher than average (e.g. Denmark and Sweden). Nevertheless, the general trend in almost all countries is the same: substantial increases since 1980 and the likelihood that this trend will continue for some time into the future (Figure 3). Forecasts suggest that a growth in transport energy consumption per capita can be expected in almost all countries between 2000 and 2030, with the possible exception of Denmark, Finland and Sweden where stabilisation could be expected (European Commission, 2003).

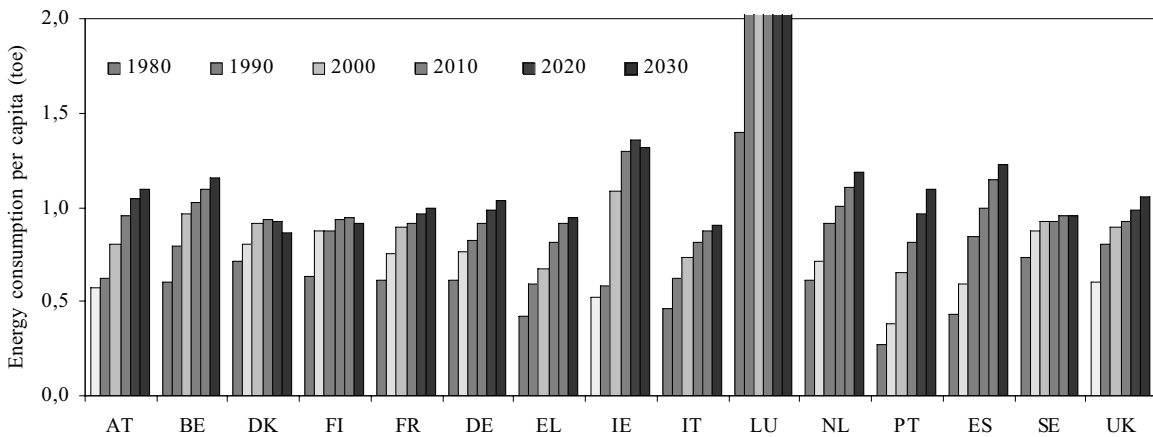
This paper focuses on public actions, intentions and attitudes concerning energy consumption in the residential and transport sectors. Three general areas of energy efficiency are examined in the residential sector: home insulation, heating reduction, and home-appliance efficiency. In the transport sector, the reduction of energy used by the car is examined. For each of these four general areas of energy efficiency (i.e. three in the residential sector and one in the transport sector), a comparison between countries and a comparison over time (between 1984, 1993 and 2002) is presented. Actions that have been carried out by individuals in these four areas and intentions to act in the future are compared by country and over time. Using data from 2002, some of the differences in action and intention according to age, gender and education are explored. Finally, the level of support for different general types of energy efficiency meas-

1. The question whether transport growth can be decoupled from economic growth is subject to ongoing debate and examination (see for example Banister and Stead, 2002; OECD, 2004; Stead and Banister, 2003).



source: European Commission, 2003.

Figure 2. Residential energy consumption per capita per country, 1980 to 2000, and projections to 2030.



source: European Commission, 2003.

Figure 3. Transport energy consumption per capita per country, 1980 to 2000, and projections to 2030.

ures such as taxes, regulations, information campaigns and financial incentives are explored using 2002 data. Here differences in support according to socio-economic reasons such as age, gender and education are also explored.

The data on which this paper is based come from three special Eurobarometer surveys carried out in all European member states in 1984, 1993 and 2002 on behalf of the European Commission. The datasets were supplied by the Central Archive for Empirical Social Research at the University of Cologne. The three surveys are reasonably comparable in many ways, although two important differences need to be noted. Firstly, the number of member states increased from 10 to 12 between the first and the second survey (Portugal and Spain became members of the European Community in 1986), and from 12 to 15 between the second and third survey (Austria, Finland and Sweden became members of the European Community in 1995). Thus, data in the 1984 survey do not cover Spain, Portugal, Austria, Finland or Sweden, and the data from the 1994 survey do not cover Austria, Finland or Sweden. None of the three surveys cover any of the new Member States of the European Union (Cyprus, the Czech Republic, Estonia, Hungary, Latvia,

Lithuania, Malta, Poland, the Slovak Republic, and Slovenia). Secondly, some of the survey questions relating to energy efficiency were phrased in slightly different ways in the three surveys. In the 1984 and 1993 surveys, for example, respondents were asked about action and intentions to cut down on heating whereas in the 2002 survey respondents were asked about action and intentions to cut down on heating and/or air conditioning (Appendix 1).

Actions and intentions concerning energy efficiency in the home

Three general areas of energy efficiency are examined in the residential sector: home insulation, heating reduction, and home-appliance efficiency. Each of these three areas is presented in turn in this section. In each of these three general areas, a comparison of actions and intentions between countries and over time (between 1984, 1993 and 2002) is presented. Using data from 2002, some of the variations in action and intention according to age, gender and education are also explored.

HOME INSULATION

More than one third (around 35%) of all the 2002 survey respondents across the EU15 reported that they had insulated their home to save energy: a gradual decrease since 1993 and 1984. Around 39% of all 1993 survey respondents and 43% of all 1984 survey respondents reported that they had insulated their home. Some substantial differences across different countries are apparent (Figure 4). More than half of the survey respondents from Luxembourg and the UK report that they have insulated their home, whereas less than one fifth of respondents from countries such as Greece, Spain or Portugal report action in this area. Climatic reasons are obviously one reason for this. Perhaps more interesting is the observation that action to insulate the home has decreased over time in a number of countries: examples include the Netherlands, Germany, Luxembourg and Ireland. Various explanations are possible. It could be, for example, that fewer people feel the need to do this because buildings are now better insulated. On the other hand, it could be that reducing energy is not as important to individuals because of lower energy costs. Examining data from the 2002 survey in more detail, it is clear that there are differences in actions according to education and age but few differences according to gender (Table 1). More educated groups and older age groups are more likely to report that they have insulated their home. It can be speculated that education and age are strong determinants of housing tenure, which in turn is likely to be related to the decision to insulate the home.

In terms of intentions to insulate the home in the future, less than 14% of all respondents to the 2002 survey reported that they intended to insulate their home: a substantial decrease since 1993 and 1984. Around 36% of all 1993 survey respondents and 25% of all 1984 survey respondents reported that intended to insulate their home. In almost all coun-

tries, more respondents reported that they intended to insulate their home in the 1993 survey than in the 1984 or 2002 survey (Figure 5). One explanation for this observation could be the fact that in a number of European countries many more homes are now insulated than two decades ago and thus intentions to insulate the home will be lower. In terms of differences between socio-economic variables, data from the 2002 survey suggests that there is little difference in intention to insulate the home according to age and sex (Table 2). However, there are some noticeable differences according to education: more educated groups are more likely to report that they intend to insulate their home.

HOME HEATING

More than two fifths (43%) of all the 2002 survey respondents across the EU15 reported that they had taken action to cut down on heating in the home. In most countries, the reported level of action was higher in 2002 than in 1993 (Figure 6). Action to cut down on heating in the home was consistently high in 1984, 1993 and 2002 in countries such as Denmark and the Netherlands, whilst action has been consistently low in countries such as Ireland and Portugal. It may be that this could be related to differences in the costs of energy in these countries. Various differences in action according to socio-economic variables such as age, sex and education are apparent from the 2002 survey data (Table 3). The younger age group (age 20-34) are less likely to have taken action to cut down on heating and/or air conditioning. Women are more likely to have cut down on heating and/or air conditioning than men, and more educated groups are more likely to have cut down on heating and/or air conditioning.

Only 15% of all the 2002 survey respondents across the EU15 reported that they intend to cut down on heating in the future, marking a significant decrease in intention since 1993. In most countries, intentions to cut down on heating were higher in 1993 than in 1982 or 2002 (Figure 7). In 2002, intentions to take action were highest in Denmark and Sweden, where 27% and 28% of respondents respectively said that they intend to cut down on heating in the future. In the UK and Portugal, intentions to cut down on heating were particularly low in 2002: only 7% of respondents in both countries said that they intend to take action in the future. In terms of socio-economic factors, intentions to take action do not appear to substantially differ according to age or sex but some differences in intention according to education are

Table 1. Reported action concerning home insulation (2002 data).

Sex	Education	Age:					All
		20-34	35-49	50-64	65+		
Male	Left education at/before 15	16%	33%	33%	30%	30%	
	Left education 16-19	26%	42%	40%	49%	37%	
	Left education 20+	25%	45%	46%	50%	38%	
female	Left education at/before 15	16%	27%	27%	25%	25%	
	Left education 16-19	30%	41%	42%	37%	37%	
	Left education 20+	26%	49%	47%	37%	37%	

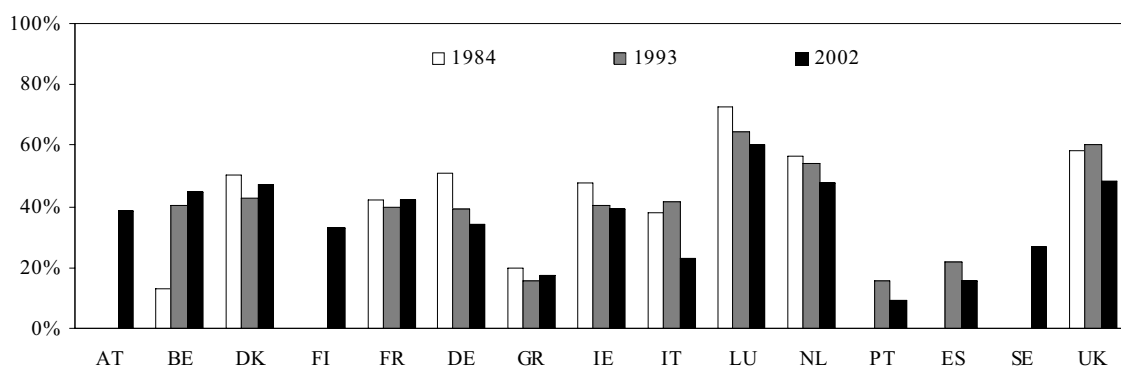


Figure 4. Proportions of respondents reporting to have insulated their home.

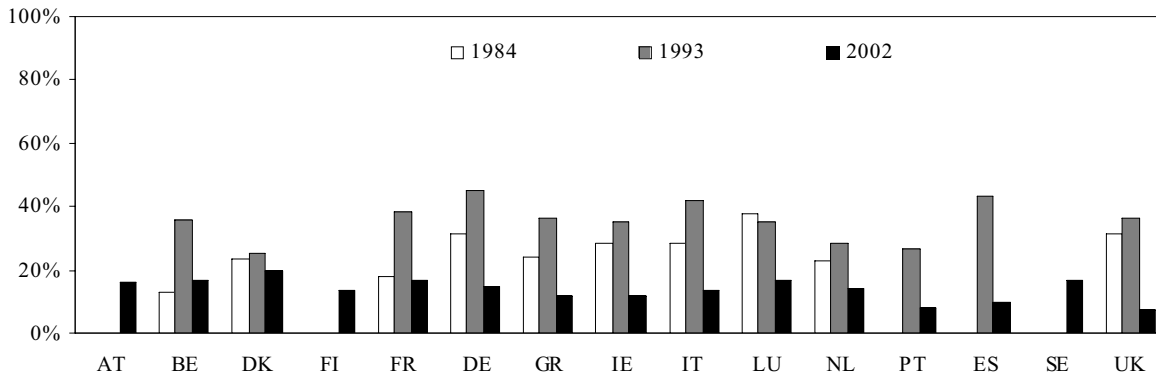


Figure 5. Proportions of respondents intending to insulate their home.

apparent (Table 4). More educated groups are more likely to intend to cut down on heating and/or air conditioning.

HOME APPLIANCES

More than half (51%) of all the 2002 survey respondents across the EU15 claimed to have cut down on lighting in the home and/or the use of electrical appliances. This is higher than action reported in the 1984 and 1993 surveys. The proportion of people reporting to have cut down on the use of electrical appliances has consistently increased in a number of countries across the EU15 including Belgium, Denmark, Luxembourg and the Netherlands (Figure 8). In Denmark, 79% of respondents to the 2002 survey claimed to have cut down on the use of electrical appliances. Energy costs may well play a role here. In some other countries, however, the proportion of people reporting to have cut down on the use of electrical appliances has decreased over time. Examples here include Greece, Portugal and Spain. Examining data from the 2002 survey in more detail, it is clear that there are differences in actions according to age and sex but few differences according to education (Table 5). The younger age group (age 20-34) is less likely to have cut down on the use of electrical appliances. Women are more likely to report that they have cut down on the use of electrical appliances than men.

Only 17% of all the respondents to the 2002 survey reported that they intended to cut down on lighting in the home and/or the use of electrical appliances in the future. Looking

Table 2. Reported intentions concerning home insulation (2002 data).

Sex	Education	Age:				All
		20-34	35-49	50-64	65+	
Male	Left education at/before 15	15%	10%	12%	10%	12%
	Left education 16-19	13%	14%	15%	12%	14%
	Left education 20+	16%	19%	16%	13%	16%
female	Left education at/before 15	11%	13%	10%	8%	10%
	Left education 16-19	13%	15%	14%	8%	13%
	Left education 20+	18%	18%	17%	9%	17%

Table 3. Reported action concerning cutting down on heating and/or air conditioning (2002 data).

Sex	Education	Age:				All
		20-34	35-49	50-64	65+	
Male	Left education at/before 15	31%	37%	41%	38%	38%
	Left education 16-19	35%	46%	43%	42%	42%
	Left education 20+	40%	47%	49%	44%	44%
female	Left education at/before 15	39%	38%	42%	42%	41%
	Left education 16-19	40%	48%	48%	45%	45%
	Left education 20+	43%	52%	57%	48%	49%

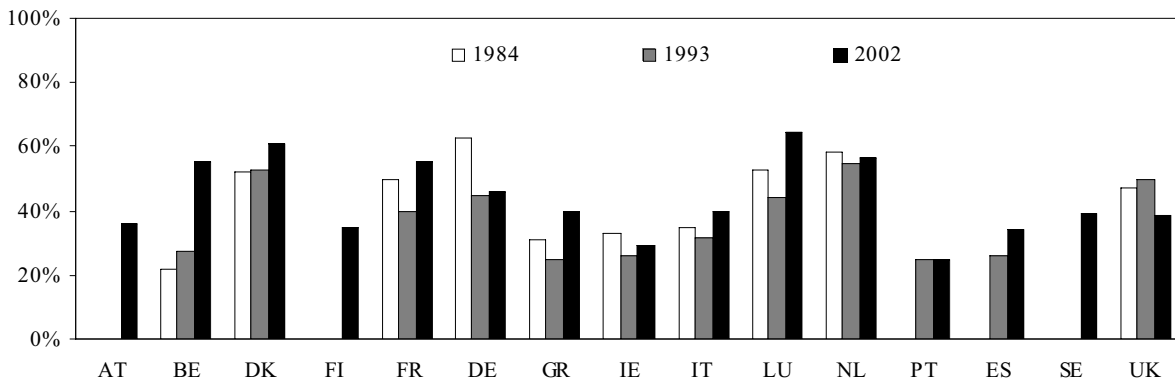


Figure 6. Proportions of respondents reporting to have cut down heating in the home.

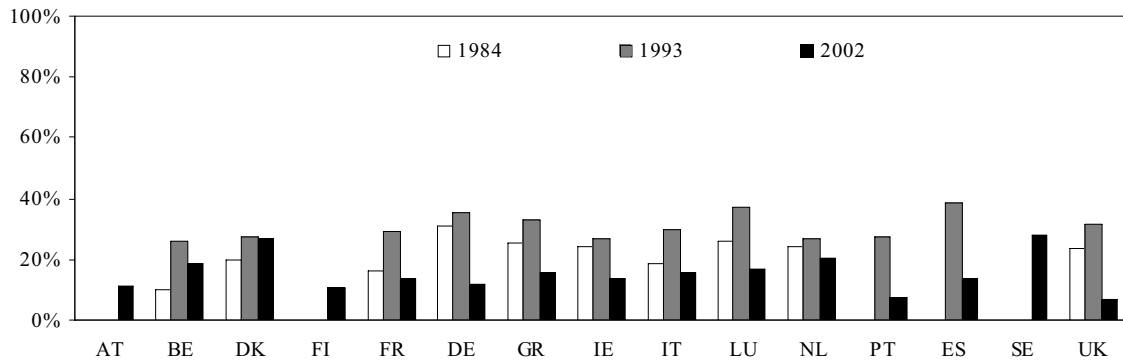


Figure 7. Proportions of respondents intending to cut down heating and/or air conditioning in the home.

Table 4. Reported intentions concerning cutting down on heating and/or air conditioning (2002 data).

Sex	Education	Age:				
		20-34	35-49	50-64	65+	All
Male	Left education at/before 15	15%	14%	12%	11%	12%
	Left education 16-19	15%	13%	13%	14%	13%
	Left education 20+	17%	19%	19%	20%	18%
female	Left education at/before 15	9%	11%	11%	11%	11%
	Left education 16-19	16%	14%	15%	16%	15%
	Left education 20+	19%	19%	23%	20%	20%

Table 5. Reported action concerning cutting down on lighting and/or electrical appliances (2002 data).

Sex	Education	Age:				
		20-34	35-49	50-64	65+	All
Male	Left education at/before 15	37%	45%	50%	49%	47%
	Left education 16-19	43%	49%	48%	48%	47%
	Left education 20+	44%	52%	52%	55%	49%
female	Left education at/before 15	52%	55%	56%	56%	55%
	Left education 16-19	48%	50%	54%	51%	50%
	Left education 20+	58%	62%	61%	54%	59%

at the trends in different EU Member States, some big differences over time are apparent (Figure 8). Intentions to cut down on the use of electrical appliances in Greece, Portugal and Spain, for example, were higher than in all other Member States in 1993, whilst intentions were lower than in most other Member States in the 2002 survey. Across almost all countries, intentions to cut down on the use of electrical appliances were much lower in 2002 compared to 1993 and 1984. Some differences in intentions to take action are apparent (Table 5). More educated groups appear to be more likely to intend to cut down on the use of electrical appliances. Women are more likely to intend to cut down on the use of electrical appliances than men. Few significant differences according to age and intentions are apparent.

Actions and intentions concerning transport energy efficiency

Just over one fifth of all the 2002 survey respondents (22%) claim to have cut down on car fuel use.² This is lower than reported action in 1994 or 1983. In many countries in the EU15, a decline in reported action to reduce car fuel use is apparent (Figure 10). Responses in countries such as France, Germany, Italy, Ireland and the UK show a consistent decline in action to reduce car fuel use between the 1983, 1994 and 2002 surveys. Fewer than 10% of the 2002 survey respondents in Greece, Portugal and Spain claim to have taken action to cut down on car fuel use. A substantial drop in action to reduce car fuel use is apparent in France

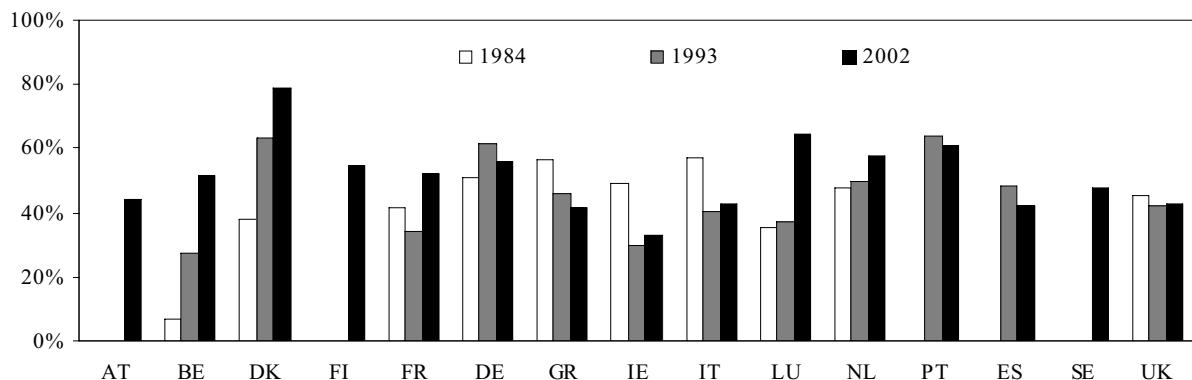


Figure 8. Proportions of respondents reporting to have cut down on the use of lighting and/or electrical appliances.

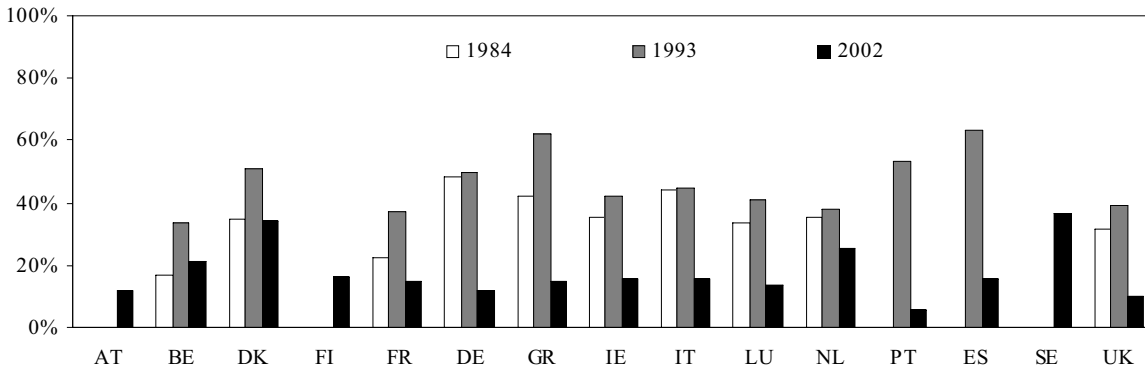


Figure 9. Proportions of respondents intending to cut down on the use of lighting and/or electrical appliances.

and Ireland between the 1984 and 1993 surveys. There appear to be some significant differences in action according to socio-economic variables such as age, sex and education (Table 7). The younger age group (age 20-34) is least likely to have taken action to reduce car fuel use. Men are more likely than women to claim to have reduced car fuel use and more educated groups are more likely to claim to have reduced car fuel use. This would appear to reflect some of the differences in car ownership across society: younger people are less likely to be car owners, as are women and less educated groups. Those without a car obviously cannot take action to reduce car fuel use.

Just 12% of all the 2002 survey respondents across the EU15 intend to take action to cut down on car fuel use: substantially lower than stated intentions in the 1984 and 1993 surveys. In many Member States, intentions to cut down on car fuel use were higher in 1993 than in 1984 or 2002 (Figure 11). In 1993, more than one third of all respondents in Germany, Greece and the Netherlands reported that they intended to cut down on car fuel use. In 2002, however, the proportion of respondents intending to cut down on car fuel use had more than halved. According to the 2002 survey, intentions to reduce car use were highest amongst Swedish respondents (25% of respondents intend to take action) and lowest amongst Portuguese respondents (3% of respondents intend to take action to cut down on car fuel). According to the 2002 survey data, there are differences in intentions to reduce car fuel use according to age, sex and education variables (Table 8). More educated groups are more likely to in-

Table 6. Reported intentions concerning cutting down on lighting and/or electrical appliances (2002 data).

Sex	Education	Age:				
		20-34	35-49	50-64	65+	All
Male	Left education at/before 15	10%	16%	14%	12%	13%
	Left education 16-19	14%	15%	13%	12%	14%
	Left education 20+	19%	19%	22%	20%	20%
female	Left education at/before 15	14%	11%	14%	14%	14%
	Left education 16-19	18%	17%	16%	17%	17%
	Left education 20+	24%	22%	26%	29%	24%

Table 7. Reported action concerning cutting down on car fuel (2002 data).

Sex	Education	Age:				
		20-34	35-49	50-64	65+	All
Male	Left education at/before 15	14%	23%	23%	20%	21%
	Left education 16-19	19%	26%	26%	26%	24%
	Left education 20+	21%	25%	31%	36%	26%
female	Left education at/before 15	18%	16%	14%	9%	13%
	Left education 16-19	19%	22%	24%	15%	20%
	Left education 20+	21%	31%	30%	29%	26%

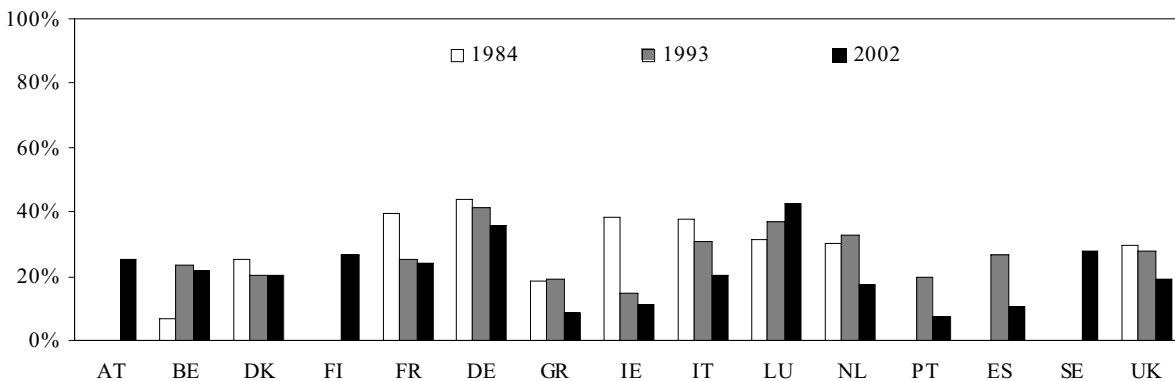


Figure 10. Proportions of respondents reporting to have cut down on the use of car fuel.

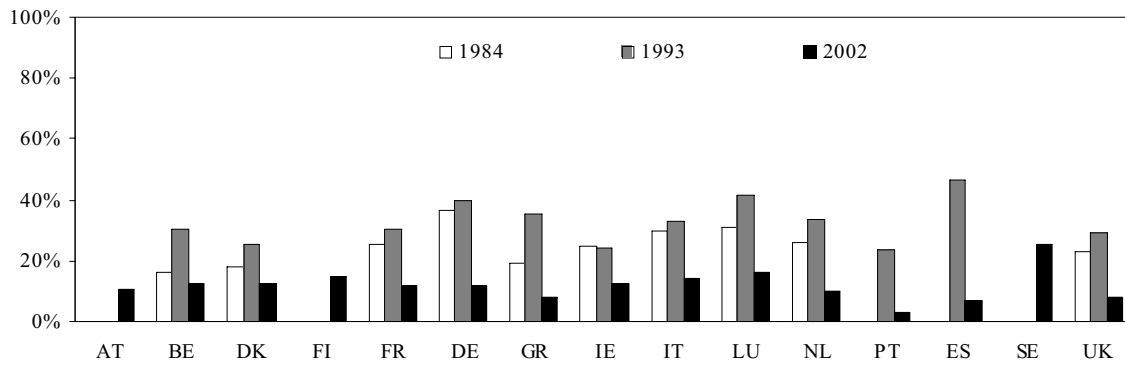


Figure 11. Proportions of respondents intending to cut down on car fuel.

Table 8. Reported intentions concerning cutting down on car fuel (2002 data).

Sex	Education	Age:					All
		20-34	35-49	50-64	65+		
Male	Left education at/before 15	10%	13%	8%	9%	10%	
	Left education 16-19	13%	13%	14%	12%	13%	
	Left education 20+	14%	13%	14%	15%	14%	
female	Left education at/before 15	9%	9%	7%	4%	6%	
	Left education 16-19	11%	12%	14%	8%	12%	
	Left education 20+	16%	15%	17%	12%	16%	

tend to reduce car fuel use. Older age groups (over the age of 65) are least likely to intend to reduce car use. Again, this would appear to reflect some of the differences in car ownership across society: older people are less likely to be car owners, and more educated groups are more likely to be car owners. In terms of differences of intentions to reduce car fuel use between men and women, there seems to be a slightly more complex relationship. More educated women intend to take more action to reduce car fuel use than more educated men, whilst less educated men intend to take more action to take more action than less educated women.

Levels of public support for energy efficiency measures

Data from the 2002 survey are used to briefly explore the level of public support for different types of general energy efficiency instruments including taxes, regulations, information campaigns and financial incentives. The 2002 survey contained questions about 7 main types of energy efficiency instrument:

- taxes on individuals
- regulations for individuals
- financial incentives for individuals
- traffic regulations
- public information campaigns
- taxes on industry
- regulations for industry

Of these 7 measures, taxes on individuals received least support: only 12% of respondents gave their support to this instrument (Figure 12). Taxes on industry attracted somewhat more support (25% of respondents gave their support to this instrument). In general, regulations received more support than taxes. Almost half of all survey respondents (47%) gave their support to regulations for industry although fewer respondents gave their support to traffic regulations (27%) and regulations for individuals (24%). Almost one third of all respondents (32%) gave their support to public information campaigns. The measures receiving most support from the survey respondents were financial incentives for individuals: 47% of respondents gave their support to this instrument.

Across different Member States, different levels of support for these instruments can be found but a similar pattern in the level of support can be seen in most countries: least support for taxes, more support for regulations (especially on industry) and most support for public information and financial incentives (Table 9). Analysis of socio-economic variables such as age, sex and education (not included in this paper) indicates that some of these seem to influence the level of support of these instruments. Education, in particular seems to be an important factor.

Clearly, public support for policy instruments is not necessarily the same as professional or political support, nor is it any indication of the effectiveness of the instruments in promoting greater energy efficiency. Indeed, public support for instruments may be due to their ineffectiveness and lack of impact. This is certainly the speculation by some authors who have examined public attitudes to policy in the transport sector (e.g. Jones 1991; Rienstra et al, 1999; Stead, 2004). Many attitudinal surveys concerning transport policies show that the public generally favour 'carrots' in preference to 'sticks' to tackle transport problems, whilst empirical evidence suggests that 'sticks' are often more effective than 'carrots', and that 'carrots' are frequently more expensive than 'sticks' (Stead, 2004).

Conclusions

This paper has drawn on data from three Special Eurobarometer surveys from 1984, 1993 and 2002 to examine temporal and geographical trends in individual actions and intentions concerning energy efficiency across Europe. The main focus of the paper has been on broad energy efficiency measures relating to energy efficiency in the home and in

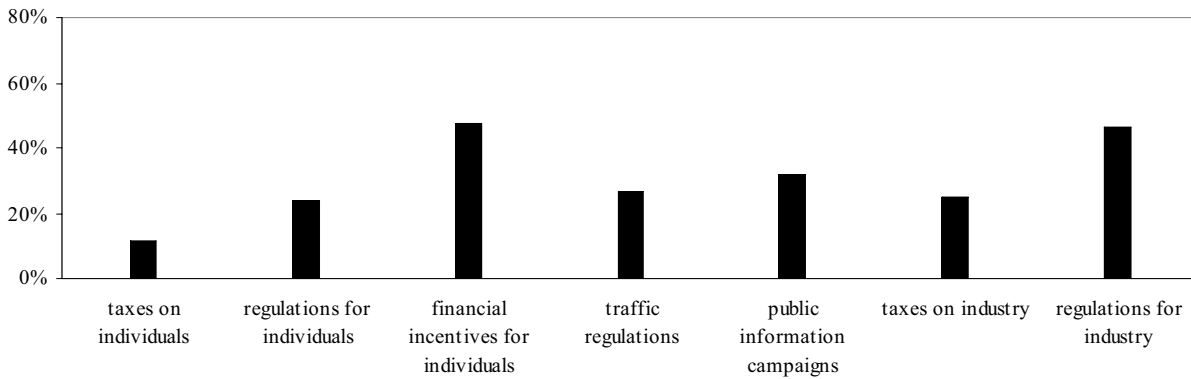


Figure 12. Public support for instruments to promote energy efficiency (2002 data).

Table 9. Public support for selected energy efficiency measures (2002 data).

	FR	BE	NL	DE	IT	LU	DK	IE	UK	GR	ES	PT	FI	SE	AT	EU15
taxes on individuals	10%	11%	16%	10%	6%	14%	20%	10%	12%	8%	7%	7%	10%	15%	19%	12%
regulations for individuals	24%	22%	27%	23%	24%	26%	25%	34%	32%	23%	13%	21%	20%	16%	25%	24%
financial incentives for individuals	40%	44%	59%	58%	47%	51%	67%	41%	52%	27%	32%	20%	50%	62%	45%	47%
traffic regulations	33%	33%	25%	28%	26%	37%	28%	26%	30%	29%	14%	19%	23%	26%	27%	27%
public information campaigns	33%	28%	43%	23%	33%	32%	29%	26%	30%	32%	42%	32%	39%	50%	18%	32%
taxes on industry	22%	26%	33%	24%	14%	31%	26%	17%	24%	30%	21%	15%	29%	31%	33%	25%
regulations for industry	58%	53%	53%	58%	46%	59%	30%	39%	41%	61%	32%	21%	48%	50%	42%	47%

the transport sector. More specifically, these include home insulation, heating reduction, home-appliance use reduction and car use reduction. Data from the 2002 Eurobarometer survey have also been used to explore differences in actions and intentions according to age, gender and education, and the level of support for different types of energy efficiency measures such as taxes, regulations, information campaigns and financial incentives.

In terms of temporal trends, it appears that action concerning most energy efficiency measures has not increased between 1993 and 2002. Perhaps more importantly is the observation that intentions to take action to reduce energy use were generally lower in 2002 than in 1993 or 1984. The increases in the amount of energy conservation since the 1980s to which Lutzenhisser (1993) refers appear to have started to decline. For energy measures such as the reduction of lighting and/or electrical appliances, home insulation and the reduction of car fuel use, a substantially smaller proportion of respondents to the 2002 survey intended to take action in these areas in the future compared to 1993 and 1984. Within Member States, energy consumption patterns are often quite different from each other as a consequence of various factors such as climate, industrial base, income and development. Similarly, actions and intentions to reduce energy consumption often vary from one country to another. Reported actions and intentions are generally higher in the more affluent, more energy intensive countries where there is more potential for energy savings.

What is also apparent from the data is that reported actions are higher than reported intentions. The inference is that many people believe that they have already done what they can (see also Boardman, 2004). According to the 2002 Eurobarometer survey, for example, 77% of all respondents reported that they had taken action concerning at least one of the four broad energy efficiency measures examined (home insulation, heating reduction, home-appliance efficiency, and car fuel use)³ whereas just 39% of respondents intended to take further action in any of these four areas. Looking at this another way, almost a quarter of all respondents to the 2002 survey (23%) reported taking no action on energy efficiency in any of these four areas whilst substantially more than half of all respondents (61%) reported that they did not intend to take further action in any of these areas of energy efficiency.

In many cases, socio-economic variables such as age, gender and education appear to influence actions and intentions to save energy. In terms of the effect of age, action on all four of the main energy efficiency measures examined (home insulation, heating reduction, home-appliance use reduction and car use reduction) seems to vary according to the age of the respondent. There are noticeable differences in action concerning home insulation, heating reduction and car use reduction according to the level of education of the respondent. There are gender differences concerning action on heating reduction, home-appliance use reduction and car use reduction. Education appears to be the most important influence on intentions to save energy: there are differences

3. The majority of the respondents who reported taking some action on energy efficiency only did so in one or two of the four main areas (home insulation, heating reduction, home-appliance efficiency, or car fuel use): few respondents (around 20%) reported taking action on three or four of these main areas.

in intentions concerning home insulation, heating reduction, home-appliance use reduction and car use reduction according to the level of education of the respondent. It is perhaps no coincidence that more educated groups are the ones that are likely to consume the most energy and thus have more potential for energy savings. Some years ago, Crossley noted something similar: a tendency for people 'with attitudes in favour of energy conservation to actually use more energy in the home' (Crossley, 1983:p538). Also in line with these observations, are the results of a social survey in the UK that indicate a social divide with regard to environmental action such as energy conservation (MORI, 2002). According to the survey report, public concerns about these issues reflect socio-economic status: the professional middle class are more likely to be environmentally aware and more likely, or able, to take action.

Data from the 2002 survey also reveals different levels of public support for various types of energy efficiency instruments such as taxes, regulations, information campaigns and financial incentives. There is least support for taxes, more support for regulations (especially on industry) but most support for public information and financial incentives. In other words, 'sticks' are less popular than 'carrots'. This finding is consistent with various other studies on public attitudes to policy. Socio-economic variables such as age, sex and education also appear to influence the level of support for all types of instruments, most of all education. It must be remembered however that the support for policy instruments is not an indication of the effectiveness of the instruments in promoting greater energy efficiency. Indeed, public support for instruments may precisely be due to their ineffectiveness and their lack of impact.

In summary, the paper has revealed some important temporal, geographical and socio-economic differences in action and intentions concerning energy efficiency as well as some geographical and socio-economic differences in public support for energy efficient instruments. Such information is clearly an important starting point for future action on energy efficiency.

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Appendix 1. Questions concerning energy efficiency actions and intentions in the Eurobarometer surveys.

Eurobarometer 22 (1984), q 174 & 175:	Eurobarometer 39.1 (1993), q 10 & 11:	Eurobarometer 57.0 (2002), q 24:
Reduced heating costs by improving the insulation in your home (e.g. double glazing, improved roof insulation, adjustment of the controls of your heating equipment)	Reduced heating costs by improving the insulation in your home (e.g. double glazing, roof insulation, adjusting the controls of your heating equipment)	Insulated my house (walls, windows)
Reduced heating costs by reducing the temperature or amount of heat you use	Reduced heating costs by cutting down on the heating you use	Cut down on heating and/or air conditioning
Cut down petrol used in your car (by using the car less, driving more gently)	Cut down on petrol used in your car (e.g. using the car less, driving more slowly)	Cut down on fuel used in my car (e.g. using the car less, driving more slowly)
Economised in lighting or the use of other electrical appliances you have in your home	Economised on lighting or the use of other electrical appliances you have in your home	Cut down on lighting and/or the use of domestic electrical appliances