

Saving energy

by
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Established politicians say it, authorities say it, and not least the environmental movement says it – we must reduce our energy usage. The reasons can vary: sources of oil are running out; burning for energy adds to the greenhouse effect; burning for energy pollutes and is a risk to human health; the money can be better used than for expensive energy. However, regardless of the reason, the message is the same – save energy. And extensive energy saving campaigns get under way.

Our first question is the obvious one: how are things among the masses? Are they saving energy? And, if so, which of them are saving energy and where are they making savings? Our second question is more theoretical: what factors affect the way people act when it comes to using energy? It is a natural hypothesis that social and financial circumstances play a role. Poor people have a greater need to cut back and save than rich people. They have to count the pennies to make ends meet. People living in houses have more opportunities to save energy than people living in apartments, and perhaps also a greater need since heating is often more expensive in a house than in an apartment. Another hypothesis is that attitude also plays a role. More specifically we imagine that people with an environmentally friendly green ideology are more receptive to calls to save energy than other people without such an ideological outlook.

More specifically it may be said that we are putting a kind of *homo economicus* hypothesis up against an ideology hypothesis. To what extent is people's energy saving controlled by their wallet and to what extent by green ideological ideas? If poor people, regardless of their opinions on green issues, save energy more than rich people, we have an example of financially motivated behaviour. If, on the other hand, people with a green attitude, regardless of their financial circumstances, save energy more than people without a green attitude, we have ideologically motivated behaviour. Our empirical test is going to show to what extent we get either of these two separate outcomes.

The data consists of the 2004 SOM survey and a special list of questions about people's energy use in various contexts. We asked about energy saving in five different cases – heating of the home, use and choice of lighting, use and choice of electrical appliances, hot water consumption and transport/travel. The questionnaire question was worded as follows: "How often do you try to reduce your energy use in the following contexts?"¹

It is important to bear in mind that we are not measuring behaviour. We are measuring people's reports on their own behaviour. And there can be a big difference. People may, in our case with good reason, suspect that the response to the saving questions is going to have a positive bias. It is more socially acceptable to save than to waste. The proportion of people who say that they are trying to reduce their energy use is therefore highly likely to be somewhat too high compared with the proportion who really *de facto* do something. How large this overestimate may be we do not know. However, the results suggest that it cannot be particularly large, since seen overall the proportion of people who state that they try to save energy is relatively low. But it is clear that if we make the unrealistic

¹ The Survey on Swedish energy opinions is part of the research project *Energiopinionen i Sverige* (Energy Opinion in Sweden) which is financed by the *Swedish Energy Agency*.

assumption that all people who say that they save do not in fact do so, we get an overestimate of no more than 15 to 25 percentage points.

Nor do we know how big the overestimate may be in various social and political groups. However, it is a reasonable assumption that there are no dramatic difference between men and women, between young and old or between Social Democrat and Moderate. If you want to be extra cautious, we can say that the study does not concern savings behaviour, but attitude or inclination towards savings behaviour. People who say they save energy wish or would very much like to really save.

The results in Table 1 show that between 15% and 25% of respondents stated that they *very often* or *always* try to reduce their energy use in the ways indicated. The most popular are to save on lighting and heating, while the least popular is to save energy on travel.

The proportion of people who pay absolutely no attention to energy saving, and say that they never try to reduce their energy use, is roughly equally large. Between 8% and 20% of Swedes state that they never save energy, with the highest proportion in relation to travel and the lowest in relation to lighting. The lukewarm, middle responses that the respondent *sometimes* or *quite often* tries to reduce energy use were by far the most common responses, given by around 60% of people.

Table 1 Trying to reduce energy use (per cent)

question: “How often to you try to reduce your energy use in the following contexts”

| | never | sometimes | quite often | very often | always | total percent | number of respondents |
|---|-------|-----------|-------------|------------|--------|---------------|-----------------------|
| heating the home | 15 | 31 | 29 | 16 | 9 | 100 | 1656 |
| use and choice of lighting | 8 | 30 | 37 | 18 | 7 | 100 | 1664 |
| use and choice of electrical appliances/tools/equipment | 19 | 35 | 29 | 12 | 5 | 100 | 1658 |
| hot water consumption | 16 | 30 | 33 | 14 | 7 | 100 | 1663 |
| transport/travel | 20 | 41 | 24 | 11 | 4 | 100 | 1641 |

Comments: People who did not respond to the question are not included in the percentage base. The proportion of people who did not respond to the various saving questions varied around 6% to 7%.

The various forms of saving overlap to a large extent among the respondents. People who tend to save energy in one context also tend to save energy in other contexts. All the correlations are clearly positive. The correlation(s) between people’s use of the various methods of saving are clear and fall between a maximum of +.68 and a minimum of +.39.² The correlation is sufficiently clear to make it possible to construct an index covering all five different forms of saving. In Table 2 we have divided such an index into three and classified the respondents into three groups – people who tend to save energy *a little*, *moderately* or *a lot*. The results show to what extent people save energy in various social and political groups.

² The correlation between forms of energy saving is highest when it comes to lighting and choice of electrical appliances(+.69). The correlation is lowest when it comes to trying to reduce energy use through heating of the home and transport/travel (+.39).

Table 2 Energy saving in various social and political groups (per cent)

| | Energy saving | | | total per cent | number of respondents |
|---------------------------|---------------|-----------------|------------|----------------|-----------------------|
| | save a little | save moderately | save a lot | | |
| gender | | | | | |
| male | 33 | 35 | 32 | 100 | 845 |
| female | 29 | 36 | 35 | 100 | 835 |
| age | | | | | |
| 15-30 | 48 | 34 | 18 | 100 | 324 |
| 31-60 | 31 | 35 | 34 | 100 | 883 |
| 61-85 | 20 | 37 | 43 | 100 | 473 |
| place of residence | | | | | |
| rural area | 20 | 35 | 45 | 100 | 249 |
| small built-up area | 26 | 34 | 40 | 100 | 366 |
| town, large built-up area | 34 | 37 | 29 | 100 | 785 |
| the three big cities | 39 | 33 | 28 | 100 | 259 |
| education | | | | | |
| basic level | 26 | 34 | 40 | 100 | 424 |
| intermediate level | 32 | 36 | 32 | 100 | 756 |
| university | 35 | 34 | 31 | 100 | 483 |
| income | | | | | |
| very low | 31 | 30 | 39 | 100 | 327 |
| quite low | 29 | 33 | 38 | 100 | 338 |
| medium | 33 | 36 | 31 | 100 | 288 |
| quite high | 31 | 38 | 31 | 100 | 280 |
| very high | 32 | 39 | 29 | 100 | 356 |
| housing | | | | | |
| house | 23 | 38 | 39 | 100 | 959 |
| apartment | 43 | 32 | 25 | 100 | 659 |
| family social class | | | | | |
| blue collar | 30 | 34 | 36 | 100 | 722 |
| farmer | 25 | 35 | 40 | 100 | 52 |
| white collar | 30 | 37 | 33 | 100 | 443 |
| managerial | 35 | 35 | 30 | 100 | 248 |
| entrepreneur | 36 | 37 | 27 | 100 | 142 |
| party preference | | | | | |
| Left Party | 28 | 38 | 34 | 100 | 143 |
| Social Democrats | 28 | 37 | 35 | 100 | 540 |
| Centre Party | 30 | 31 | 39 | 100 | 108 |
| Liberal Party | 33 | 39 | 28 | 100 | 160 |
| Moderate Party | 37 | 32 | 31 | 100 | 337 |
| Christian Democrats | 29 | 34 | 37 | 100 | 76 |
| Green Party | 27 | 35 | 38 | 100 | 89 |
| left-right dimension | | | | | |
| firmly on the left | 27 | 33 | 40 | 100 | 129 |
| somewhat on the left | 25 | 42 | 33 | 100 | 413 |
| neither left nor right | 30 | 34 | 36 | 100 | 530 |
| somewhat on the right | 36 | 35 | 29 | 100 | 405 |
| firmly on the right | 41 | 31 | 28 | 100 | 135 |
| green dimension | | | | | |
| firmly green | 20 | 41 | 39 | 100 | 215 |
| somewhat green | 30 | 32 | 38 | 100 | 451 |
| neither green nor grey | 31 | 37 | 32 | 100 | 503 |
| somewhat grey | 32 | 39 | 29 | 100 | 326 |
| firmly grey | 50 | 22 | 28 | 100 | 113 |
| all respondents | 31 | 35 | 34 | 100 | 1680 |

Comments: The figures for whether respondents save a lot or a little electricity have been derived through an additive index covering the sub-questions in Table 1. The few people who skipped some of the individual sub-questions have been attributed the value 1 for that saving, i.e. never save. People who did not respond to any of the sub-questions have been excluded from the analysis. The underlying index varies from 5 (never save) to 25 (save very often). The index values from 5 to 25 have then been divided into three. The income variable relates to household income. Households with incomes between SEK 0 and SEK 200 000 have been categorised as very low, between SEK 201 000 and SEK 300 000 as quite low, between SEK 301 000 and SEK 400 000 as medium, between SEK 401 00 and SEK 500 000 as quite high and household incomes of SEK 501 000 or above as very high. The measure of the green dimension is based on a question about an environmentally friendly society. The question is phrased as a proposal where the respondent is asked to judge whether the proposal is very good, quite good, neither good nor bad, quite bad or very bad. The wording of the question was: "Invest in an environmentally friendly society, even if it entails low or zero growth". In the table the scale from "very good proposal" to "very bad proposal" has been translated into points on a green-grey dimension where "very good proposal" corresponds to "firmly green" and "very bad proposal" corresponds to "firmly grey". The position on the left-right dimension is based on a self-classification question.

The pattern is relatively clear. Energy savers tend to be women, older, people living in rural areas, people with a low level of education, people with a low income, people living in houses, workers and farmers, Centre Party and Green Party supporters, people on the left politically and people with green ideology. The differences are sometimes small between the different groups – for example between women and men – but far more substantial between other groups – for example between young and old or between people living in houses and people living in apartments.

Of course, the various groups overlap with each other. People living in houses are more common in rural areas than in towns. People with low education tend to be older and have lower incomes. People on the left politically tend to be in the green ideological corner. We must hold the various factors constant in multivariate analyses before we can say anything about the extent to which we can speak of independent effects. It transpires that the left-right dimension has no independent effect. The same applies to gender, family social class, level of education and party preference. Other factors all have independent effects to varying degrees on the extent to which people try to save energy.

The results in Table 4 show the outcome of a series of regression analyses with some of the social and political groups as independent variables to the dependent variable of energy saving. The analysis has not been limited to studying only the variation in the energy saving index. We have also analysed the correlation for each and every one of the various forms of energy saving. It transpires, in fact, that the patterns look somewhat different, depending on which form of saving we are talking about. For the sake of clarity, Table 3 shows the proportion of respondents in the various social and political groups who state that they very often or always try to reduce energy use when it comes to the areas of saving we are studying, i.e. heating, lighting, choice of electrical appliances, hot water usage and travel.

One factor has a manifest and independent effect, regardless of which form of saving we are speaking of. That factor is age. Older people save energy more than younger people in all situations; a somewhat disturbing result if it is due to the fact that an old-fashioned thrifty mentality may have been replaced by a more modern extravagant mentality among young people. The financial income variable has an independent effect – poor people save energy more than rich people – but not in all contexts. When it comes to heating the home and hot water usage, the income effect is not significant – in this case the housing factor takes over. People living in houses save most on heating and hot water, regardless of income. People living in houses have more opportunities to save energy than people living in apartments and perhaps also a greater incentive. The fact that opportunity plays a major role is shown by the fact that people living in rural areas who usually live in their own house show a particularly strong tendency to save energy when it comes to heating the home, but less when it comes to other forms of energy saving. The independent effects of income and housing show that there is support for the *Homo Economicus* hypothesis. People's financial self-interest affects the degree of energy saving. This means that financial incentives can be used if we want to bring about more energy economising.

Table 3 Different types of energy saving in different social and political groups (per cent)

| | proportion of people who very often or always try to reduce energy use | | | | |
|---------------------------|--|--------------------|---------------------------------|-----------------------|-------------------|
| | heating of the home | choice of lighting | choice of electrical appliances | hot water consumption | transport/ travel |
| gender | | | | | |
| male | 27 | 24 | 15 | 20 | 14 |
| female | 23 | 26 | 18 | 22 | 17 |
| age | | | | | |
| 15 – 30 | 13 | 17 | 10 | 10 | 10 |
| 31 – 60 | 26 | 25 | 16 | 20 | 13 |
| 61 – 85 | 31 | 30 | 22 | 31 | 24 |
| place of residence | | | | | |
| rural area | 42 | 36 | 23 | 27 | 20 |
| small built-up area | 30 | 24 | 17 | 27 | 14 |
| town, large built-up area | 21 | 22 | 15 | 18 | 14 |
| the three big cities | 16 | 25 | 14 | 16 | 16 |
| education | | | | | |
| basic level | 26 | 27 | 20 | 26 | 20 |
| intermediate level | 27 | 24 | 15 | 20 | 13 |
| university | 22 | 25 | 17 | 19 | 16 |
| income | | | | | |
| very low | 25 | 30 | 25 | 24 | 23 |
| quite low | 25 | 28 | 16 | 24 | 20 |
| medium | 20 | 23 | 14 | 20 | 14 |
| quite high | 29 | 23 | 18 | 17 | 10 |
| very high | 25 | 21 | 12 | 18 | 10 |
| housing | | | | | |
| house | 32 | 27 | 17 | 24 | 14 |
| apartment | 14 | 22 | 15 | 16 | 17 |
| party preference | | | | | |
| Left Party | 25 | 24 | 20 | 20 | 20 |
| Social Democrats | 24 | 23 | 17 | 23 | 15 |
| Green Party | 23 | 27 | 21 | 18 | 25 |
| Centre Party | 27 | 31 | 12 | 23 | 18 |
| Liberal Party | 24 | 22 | 10 | 18 | 13 |
| Christian Democrats | 24 | 22 | 12 | 22 | 16 |
| Moderate Party | 26 | 28 | 17 | 21 | 11 |
| green dimension | | | | | |
| firmly green | 27 | 34 | 26 | 27 | 25 |
| somewhat green | 25 | 26 | 17 | 22 | 18 |
| neither green nor grey | 24 | 23 | 14 | 19 | 12 |
| somewhat grey | 23 | 21 | 13 | 19 | 12 |
| firmly grey | 30 | 25 | 16 | 21 | 13 |
| all respondents | 25 | 25 | 17 | 21 | 15 |

Comments: See Tables 1 and 2 for the wording of questions and delimitations.

Table 4 What explains energy saving? (β coefficients)

| independent variables | dependent variables | | | | | energy saving index |
|-----------------------|---------------------|--------------------|---------------------------------|-----------------------|-------------------|---------------------|
| | heating of home | choice of lighting | choice of electrical appliances | hot water consumption | transport; travel | |
| age | +.14 | +.11 | +.10 | +.18 | +.06 | +.12 |
| town/country | -.10 | -.02* | -.02* | -.06 | -.02* | -.05 |
| level of education | +.01* | +.02* | +.01* | -.01* | +.01* | +.01* |
| household income | -.01* | -.05 | -.07 | -.03* | -.09 | -.05 |
| house/ apartment | -.15 | -.05 | -.03 | -.08 | -.03* | -.07 |
| green/grey ideology | -.04* | -.07 | -.10 | -.07 | -.15 | -.08 |
| adj. R ² | .14 | .04 | .04 | .10 | .05 | .10 |

Comments: The results show β coefficients in multiple regression analyses (OLS) with various forms of energy saving as dependent variables. All variables are coded between 1 and 5. High values represent a high level of energy saving, high age, city, high income, living in apartments and grey ideology. Coefficients marked with an asterisk (*) are not significant at the .05 level.

But the results also show that green ideology has an independent effect on energy saving. And this is true regardless of what form of saving we are speaking of, with, however, one exception. The exception is heating of the home, where the effect measured is not statistically significant. People living in houses tend to save on heating costs regardless of whether they have a green or a grey attitude to the environment. No extra saving effort is made in this regard by people with a green ideology. However, when it comes to the other forms of saving, there is an independent effect of green ideology, which is especially clear in the choice of transport/travel. People's energy economising can be influenced by ideological arguments, perhaps also by idealistic arguments.

Our main finding is that both wallet and ideology play an independent role when Swedes save energy. In addition, the analysis has pointed to the importance of the opportunity to be able to save energy. It is more difficult to influence your energy use if you live in an apartment than if you live in a house. It is therefore not surprising that people who live in houses save energy far more than people who live in apartments. The most surprising result is, rather, that age has such a strong independent correlation with energy saving. The older retired generation economise far more on all forms of energy than middle-aged and young people. This may be due to the fact that the older people read about the characters Spara (to save) and Slösa (to waste) in the journal *Lyckoslanten* (The Lucky Penny) when they were young – and learned something?