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Summary

From 2006, all European member states will be required to run a compulsory energy-labelling scheme which will come into effect whenever a building changes hands. In its current form this energy label, as prescribed by the EC Directive on Energy Performance of Buildings, is merely a communicative instrument which is designed to provide the owner with information on the energy consumption of the building. It will not impose standards or requirements for energy efficiency. The effectiveness of communicative instruments as a means of changing behaviour is, however, often disputed, the argument being that they only work if they fill a gap in the knowledge needed for decision-making. This paper aims to ascertain how far knowledge about the energy efficiency of a building influences purchase and rental decisions and how far the information on the energy label contributes to decisions to renovate the building. Besides providing a theoretical analysis, we shall quote experience from Denmark, where compulsory energy labelling for buildings was introduced in 1997, and from the Netherlands, where a voluntary energy-labelling scheme was introduced at the end of the 1990s.

1. Research strategy

From 2006, all European member states will be required to run a compulsory energy-labelling scheme which will come into effect whenever a building changes hands. In its current form, this energy label, as prescribed by the EC Directive on Energy Performance of Buildings, is merely a communicative instrument which is designed to provide the owner with information on the energy consumption of the building. It will not impose standards or requirements for energy efficiency. It is hoped that this information will be used in purchase and rental decisions and to improve the energy efficiency of the building during conversions. The effectiveness of communicative instruments as a means of changing behaviour is, however, often disputed, the argument being that they only work if they fill a gap in the knowledge needed for decision-making.

This paper aims to ascertain how far knowledge about the energy efficiency of a building influences the purchase and rental decisions and how far the information on the energy label contributes to decisions to renovate the building. Our hypothesis is that energy labelling in itself will have only a limited effect as, in most countries, energy efficiency is a minor criterion when buying or renting a building. We also believe that, on its own, this information will not be a strong incentive for the transformation of a building. Our hypothesis is, therefore, that energy labelling needs to be combined with other policy instruments. A combination of energy labelling and tax incentives seems promising, but would have to be covered by general income tax or housing-related taxes in order to prevent social inequality. A combination of energy labelling and subsidies would have only a limited influence due to the ‘free-rider effect’. Subsidies would only cover innovative products at the beginning of their ‘learning curve’. Good results could probably be expected from combining energy-labelling standards with regulations, but not only would this involve a somewhat drastic approach, it would also take time to build up sufficient commitment. For example, the commitment to energy regulations for new buildings is the product of a gradual process of development lasting 30 years.

We will use experience from Denmark, where compulsory energy labelling was introduced in 1997, and from the Netherlands, where a voluntary energy-labelling scheme was introduced at the end of the 1990s. We interviewed a number of Danish housing associations about their experience of the energy-labelling scheme and collected experience of voluntary energy labelling from Dutch players. We will add to this existing knowledge about the effectiveness of policy instruments in the form of regulations, financial incentives and communication schemes. We shall use the experience of energy labelling in Denmark and the Netherlands and knowledge about the effectiveness of policy instruments in general as a basis for determining the probable effects of compulsory energy labelling without imposed standards.

2. How Danish housing associations experience compulsory energy labelling

Compulsory energy labelling was introduced in Denmark in 1997 under the Fourth Danish Action Plan for Energy Saving (April 1996). This consisted of two programmes from the start:
• The ‘EK programme’ for buildings with a surface area of less than 1500 m²: This programme covers individual homes and small utility buildings. An energy label is compulsory whenever this type of property is sold. An owner-occupier who wishes to sell his home is obliged to have an energy label compiled so that potential buyers can see the energy quality of the property. This energy label is based mainly on the technical characteristics of the dwelling and less on the energy consumption data of the (former) resident. Energy quality could be a criterion in the decision to buy a dwelling. At the same time, potential buyers can get an idea of the energy-saving potential, the underlying idea being that buyers often intend to renovate the house anyway and can take steps to save energy at the same time without too much extra effort.

• The ‘ELO programme’ for buildings with a surface area greater than 1500 m²: This programme covers all residential and utility buildings. Under this programme, the owner is obliged to have an energy label compiled every year. The energy label for large buildings has a slightly different basis from the ‘EK label’ for small buildings, as it involves monitoring and influencing energy consumption. In 2001, when the first results of the Danish energy-labelling system were evaluated [COWI consult, 2001], it turned out that around 50-60% of the homes sold since 1997 had an energy label. This was nowhere near good enough, given that the label was compulsory and should have been issued for all the dwellings sold. Telephone interviews revealed that the estate agents did not welcome the task of being front-line ambassadors for the label. The telephone survey among home-owners revealed that public awareness of the energy label system was fairly low. It was concluded that, up to the moment of evaluation, not nearly enough attention had been paid to telling people about the compulsory energy labels and to promoting the system.

To gain an impression of how energy labelling was experienced, telephone interviews were held with three Danish housing associations, whereby four people were questioned. Each of these housing associations had energy labels compiled for complexes larger than 1500 m². The operations of Danish housing associations are largely determined by the fact that they are run by democratically elected residents’ councils which ultimately take all the investment decisions. To complicate things further, Danish housing associations, despite their private character, are also subject to extensive government legislation. This is expressed in, amongst other things, the fact that local authorities have a say in the allocation of 25% of the stock of the local housing association. Danish housing associations may take the initiative to build new housing but are still considerably bound by local authority control. Up to now, they have not been allowed to sell homes. Given that Danish housing associations are not allowed to make a profit, are run by tenants, and are subject to extensive legislation, it is difficult for them to pursue a strategic housing stock policy as in the Netherlands. They have very little scope for market-oriented action.

The Danish housing associations do, however, all appear to pay considerable attention to monitoring the energy consumption of the residents. Often this happens on a monthly basis whereupon the results are passed on to the residents. Such monthly monitoring is completely separate from the compulsory energy labelling and is an initiative from the housing association itself. The associations also try to influence the consumption patterns by, for example, holding information evenings or publishing a monthly magazine. In many cases this has been going on for decades. Interestingly, the monitoring of energy consumption seems to play a more important role than physical interventions when it comes to actually improving energy efficiency in the buildings. This is due to the unique workings of the Danish system. As the tenants largely determine the investment programme, they want to know the monthly energy consumption so that they can control their (energy) costs. This is why the housing associations pay so much attention to the management of energy and water consumption. The tenant also decides – through residents’ councils – about physical interventions in the complexes. It is difficult for the tenants to take account of long-term, strategic considerations. In fact, decisions are usually based on short-term strategies. Energy-saving investments with a payback time of more than five years are extremely rare.

It is difficult for a Danish housing association to set ambitions for, say, energy saving, in the housing stock, because, at the end of the day, it is always the tenants who decide. That said, one of the interviewees did stress that ambitions could be set if different/better strategies were adopted to convince the residents’ councils of the importance of saving energy.

3. **How Dutch housing associations experience voluntary energy labelling**

In 1999, voluntary energy labelling was introduced in the Netherlands to provide an impression of the energy quality of existing dwellings. An energy calculation is drawn up, resulting in recommendations for the owner of the property. These recommendations, generally known as an EPA, set out energy-saving measures and their effect on the energy consumption of the home. Information is also provided on subsidies for energy-saving measures. The EPA can be seen as a form of energy labelling; it provides insight into the energy performance of a building via the Energy Index (EI) and offers recommendations for improving it and hence the EI.
The EPA programme was officially launched on 1 January 2001. The owner of a home or a business could have an EPA drawn up by, for example, an energy company, which would then recommend energy-saving measures. The EPA had to be drawn up with the aid of a software package that used a fixed method. When the EPA first came into effect, the owner of the home or the business usually implemented one or more of the recommendations. A subsidy of 350 guilders was granted toward the costs of the EPA. Another subsidy was granted under the Energy Premium Regulation (EPR) for the actual measures. Later, the costs of the EPA recommendations were repaid even if no measures were taken. The idea was that, by 2010, the EPA in combination with the EPR would eventually bring about an extra reduction of 2 Mt tons of CO₂ emissions from existing housing. On 16 October 2003, the EPR was stopped. To date (October 2004), it is not known whether and how it will be continued. When the EPR stopped the number of EPAs fell dramatically.

Various sources were consulted to gain an impression of how Dutch housing associations experienced the EPA (Donze, 2003), (Novem, 2004). A mixed picture emerged. Some housing associations were critical. The methodology was unreliable and had been developed mainly for the private market. Hence, the EPA was no use in decision-making at complex level, let alone at stock level. But some of them did see a potential role in the form of a quick-scan, possibly on the basis of the Energy Index from the EPA.

In contrast to the rest, Staedion housing association has adopted a more intensive approach to the EPA programme and even trained its own EPA consultant, but the EPA recommendations are not used in the strategic stock policy as a determinant of energy-saving measures. Here too, the end of the EPR has meant that EPA recommendations have been relegated to the back burner. Staedion assessed the instrument and it appears that there is still room for improvement: for example by better coordination or exchange of the information flows from EPA and other systems such as wocasX.

A pilot conducted by Novem on the potential applications of EPA at management level and as a Home Energy Label came up with some interesting findings. One housing association remarked that the introduction of energy labelling would require extra training for leasing staff. The pilot revealed that they did not have enough knowledge to inform house-seekers about energy labelling. Questions were also raised about how the label worked, as a C Label for a house dating from 1935 might conceivably be just as good as a B Label for a house dating from 1980. But how do you explain that to house-seekers? The housing association also said that payback was redundant in EPA because investment decisions are complex and based on many criteria. Finally, one association expressed reservations about the current property assessment system, which takes no account at all of performance requirements and does not lend itself to innovative energy-saving measures.

4. The effectiveness of energy labels for buildings

Energy labels can be embedded in different types of policy instruments. Environmental policy instruments can be structured in various ways. This paper deals with the most common typology based on three concepts: direct regulation, economic incentives and communicative instruments (Kemp, 2000; Murakami et al., 2002). Direct regulation covers policy instruments that impose environmentally-friendly behaviour by legal means. Economic incentives enhance the economic appeal of environmentally-friendly behaviour and, as the environment can be seen as a public asset for which there is insufficient market demand, try to redress market imperfections. Communicative instruments aim to persuade people to behave in an environmentally-friendly manner by providing information on the environment or by reshaping opinions and attitudes (Jordan et al., 2000; Ekeelenkamp et al., 2000). Energy certification can be used as a communicative instrument, as in the case of energy labels for household appliances. Communicative instruments can be useful for addressing information problems, but they are no substitute for economic or regulatory policy tools (Kemp, 2000; Ekeelenkamp et al., 2000).

Energy-labelling schemes for household appliances appear to be effective, perhaps because they directly address information problems in purchasing decisions. Energy efficiency can constitute one criterion in the choice of a certain product. Thanks to the energy label, this criterion can be taken on board in a purchasing decision. Manufacturers of household appliances use the energy label as a marketing instrument. However, there is a world of difference between the market for household appliances and the building market, and further differences still in the building markets from country to country. In the Netherlands, the building market seems to be suffering from a fundamental failure in terms of supply and demand; for a long time, the demand for housing has exceeded the supply. At the same time, the government often exercises a strong influence on the housing market. The production of housing can also be extremely complex, involving many different players, such as architects, contractors and the municipality. In the case of existing housing, no manufacturers are known at all. In the building market, lack of information is therefore only one of several market failures. So, an energy label is unlikely to influence purchasing decisions in housing, as the buyer is not spoiled for choice to begin with. Neither is it likely to be used as a marketing instrument since there are no obvious manufacturers.

The energy certificate for buildings includes energy advice. It is assumed that by providing information on energy-saving measures, the buyer will be encouraged to actually see them through. It is not clear, though, whether information alone is enough to make people carry out work that they would not otherwise have done.
The payback times of energy-saving measures could be long, given the relatively low energy prices at the moment. The energy-labelling scheme as proposed in Directive 2002/91/EC seems an exact copy of the Danish scheme. The discussion of this scheme in this paper shows that it is impossible to provide an unambiguous answer about the volume of savings generated by labelled buildings, since the measures that are actually implemented are not recorded in the energy certificate database (COWI consult, 2001). One evaluation study does, however, suggest large, untapped energy-saving potential (Lautsten, 2001). On the basis of these considerations we believe that it would be worthwhile to explore the possibilities of combining energy labelling for buildings with regulations or economic incentives.

The question remains as to whether energy labels can be combined with minimum energy standards. We have distinguished two approaches in energy regulations: regulations formulated as singular measures and regulations formulated in global terms, such as performance standards (Beerepoot, 2002). The second approach is usually preferred as it offers the most design freedom. And, if the standards are tightened on a regular basis, it can provide incentives for realizing innovations. Up to now, hardly any experience has been built up in imposing energy standards for existing buildings. Direct regulation of energy use in existing buildings was only initiated very recently in Germany and England and Wales by means of standards for singular measures (Gilijamse & Jablonska, 2002). The question of control is very important here, since home-owners do not currently have to obtain permission to carry out such measures. In England and Wales, energy regulations for existing buildings are controlled by self-certification schemes. The issue of control for existing buildings has already been, to some extent, addressed by Directive 2002/91/EC, which demands that the energy certification be made mandatory and therefore must be legally underpinned. In most member states home-owners do not have to deal with building regulations and building control when selling their house, so it might be more logical to incorporate the legal basis in the conveyance transactions. Formal (solicitor’s) approval of an energy certificate as one of the documents needed for selling a house seems only a small step away from having to record a specific energy standard on the basis of the energy certificate.

But perhaps a radical attempt to improve the energy efficiency of existing housing by imposing energy performance standards would be a step too far at present. After all, as we can see from the development of energy regulations for new buildings, it took about 30 years to transform singular energy regulations into global standards. It may take just as long to establish general acceptance of energy performance standards for existing dwellings. So, a first step could consist of imposing certain ‘obvious’ standards by means of singular measures, like insulation levels or boiler efficiencies. This is what is happening right now in England and Wales and Germany. After this stage, the approach could shift towards regulation via general goals, such as a mandatory ‘B’ level on an energy label. The criteria of such a ‘B’ level would then need to be tightened on a regular basis to guarantee sufficient incentives for innovations (Kemp, 2000). Control is a very important issue here and could be guaranteed via privately organized self-certification schemes or statutory control by solicitors.

Before energy-saving measures can really be tackled an answer needs to be found to the question of how to make energy-saving financially attractive to households. An overview of the environmental fiscal instruments in Europe shows increasing use of eco-taxes, although their current impact on the construction sector is still low (Sunikka, 2003). The Regulatory Energy Tax (REB), introduced in the Netherlands in 2001, has had limited success in reducing the energy consumption of households, but it does shorten the payback time of energy investments. Therefore, combining an energy tax with the energy certificate could expedite the implementation of investment plans to realize the potential energy improvements in the EC certificate. On the other hand, it can be argued that the EC energy certificate, which – as we have said – is a communicative tool, can reinforce the effectiveness of other policy instruments which are unknown to consumers, such as the Energy Tax in the Netherlands. The literature on policy instruments and the empirical data from this research show that higher energy taxes are effective in reducing a household’s energy consumption, although they are unlikely to have large-scale impact because of the low energy rates. This still leaves the question of how energy taxation can be increased without hitting low-income households (which account for only a minor share of total household demand). These households have fewer financial resources to invest in energy-saving measures and very little scope for saving energy. As the prices rise, low-income households save energy, whereas high-income households in large homes hardly seem to react at all. It has been argued, therefore, that heavy taxation of end-user energy – which can be regarded as a necessity – is neither an advisable nor a politically viable option if it causes greater inequality between rich and poor households (Anker-Nilssen, 2003). To even out the financial pressure, the energy tax should be based on the value of the dwelling or the income of the household, i.e. it should be progressive. This way, the energy certificate could be used as one factor in determining the value of the housing. Energy consumption could also be taken into account in rent recommendation systems (in e.g. the Netherlands).

In the Netherlands energy certification is combined with a subsidy scheme which almost entirely covers the procedural costs of the energy certificate. Various energy-saving measures are also subsidized in the same scheme. We found that, in general, the effectiveness and efficiency of subsidy schemes are often disputed. Evaluations of past subsidy schemes for energy-saving measures in housing concluded that only in a very limited number of cases was the subsidy the reason for implementing the energy-saving measures (Kemp, 1995), (Beumer et al., 1993), (Vermeulen, 1992). This applied especially to measures such as insulation, high-yield condensation boilers and high-efficiency double glazing – all products that are not new on the
market and should really be sold without subsidies. In the case of innovative new products where unit costs are still high but expected to decline with cumulative production, subsidies can help tackle this market failure. The Dutch energy-certification scheme continues to subsidize measures such as insulation while, at the same time, reinforcing the disadvantages of subsidies by aiming to fulfill the energy certification requirements at so-called ‘natural moments’, like the replacement of boilers or the renovation of a house. Often, in these situations, people are already planning improvements and will profit from the ‘windfall’ from the subsidy scheme. It is therefore to be expected that combining energy labels with subsidies for energy-saving measures will only be effective for innovative products as it will increase demand and production and bring down the costs.

5. Conclusions

Danish and Dutch Experience of energy labels for buildings show that both compulsory energy-labelling systems (Denmark) and voluntary energy-labelling systems (the Netherlands) have their limitations. Though the system in Denmark is compulsory, a few years after introduction still only about 50 - 60% of the dwellings sold could produce an energy label. There are no subsidies for energy-saving measures in Denmark and the evaluation showed that it was difficult to assess the energy conservation results of the label scheme. Danish housing associations pay a lot of attention to monitoring the energy consumption of tenants, but this has nothing to do with the energy-labelling scheme. The labelling scheme itself is unknown to the average tenant. In the Netherlands voluntary energy labelling was introduced along with an extensive subsidy scheme for energy-saving measures. When the costs of the scheme were fully subsidized, a great many energy labels were issued. However, when the scheme stopped, the demand for energy labels stopped as well. Our discussion of the effectiveness of energy certificates included the pros and cons of combining energy certificates with subsidy schemes. We argued that the use of the energy certificate as a communicative instrument, as suggested in the EC Directive, will not be very effective, since information problems are only one of many failures in the complex building market. The combination of energy certificates with tax schemes seems promising but would have to be covered by general income tax or housing-related tax in order to prevent social inequality. Combining the energy certificate with subsidies would have only a limited influence due to the ‘free-rider effect’ and subsidies should only cover innovative products at the beginning of their ‘learning curve’. Good results can probably be expected from combining regulations with energy certificate standards, but this would require a somewhat drastic approach and it would take time to build up sufficient commitment (as in the case of new buildings where there energy regulations have only gradually developed over the past 30 years). Since communicative tools are more likely to be effective when combined with regulatory or economic instruments, we believe that introducing an energy performance standard by means of an energy certificate in combination with progressive taxes for punishing the worst energy performances and subsidies for rewarding the best energy performances could prove a promising area of further research.

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