



Energy performance certificates – Informing the informed or the indifferent?



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ABSTRACT

Energy Performance Certificates (EPCs) are intended to provide tenants and buyers with reliable information about the energy performance of buildings. As improved energy performance may increase building sale prices and rents, the EPCs are supposed to generate incentives for owners to invest in energy efficiency. The empirical evidence for a price premium associated with energy labels is, however, inconclusive and partly contradictory. By utilizing data from the Norwegian housing market, we reproduce the positive price premium effect found in earlier studies. However, when we check these results by taking advantage of the fact that the introduction of a mandatory energy certification system represents a quasi-natural experiment, we find no evidence of a price premium. On the contrary, we present evidence that there is no effect of the energy label itself.

1. Introduction

Upgrading the energy efficiency of buildings is a major focus of industrialized countries' endeavor to achieve sustainable development. However, the process is a slow one. Although several cost-effective energy-saving measures are available to property owners, their potential for energy conservation is not being realized (Curtain and Maguire, 2011). In the literature, this is often explained by the existence of particular impediments or barriers to investment in energy-saving measures (Weber, 1997; Murphy, 2014). Market failure in the form of imperfect information is suggested to be one of these barriers (Weber, 1997; Amecke, 2012). In response, researchers and policymakers have called for increased information transparency about the energy consumption of buildings.

The imperfect information perspective is clearly reflected in the Energy Performance of Buildings Directive (EPBD), which is the main EU policy instrument used to promote energy efficiency. The EPBD is intended to provide tenants and buyers with reliable information about the energy performance of buildings at affordable costs and at the appropriate time through the use of Energy Performance Certificates (EPCs). As improved energy performance may increase buildings' sale prices and rents, the information provided to potential buyers by the EPC is supposed to generate incentives to invest in energy efficiency (Bio Intelligence Service et al., 2013).

Several studies have addressed the EU implementation of energy labeling buildings empirically. In the commercial office segment, a well

known study by Eichholtz et al. (2010) found that US office buildings with a "green rating" sold for about 16% higher prices. On the other hand, in a recent study by Parkinson et al. (2016), the researchers found a much lower, and almost negligible, premium for U.K. office buildings. Brounen and Kok (2011) provided the first evidence of the economic impact of EPC implementation for residential dwellings. They performed a hedonic regression analysis based on some 170,000 housing transactions in the Netherlands and concluded that there is a price premium for houses labeled as more energy efficient. Likewise, a report prepared for the European Commission concluded that EPCs have a significant impact on transaction prices and rents in selected E.U. countries (Bio Intelligence Service et al., 2013). The report contains a literature review of the 22 studies that use hedonic regression models to examine whether the EPCs affect property values. Moreover, the report itself provides an analysis using the hedonic regression model carried out for datasets obtained from Austria, Belgium, France, Ireland, and the U.K. It concludes that the analysis "overwhelmingly points to energy efficiency being rewarded by the market" (Bio Intelligence Service et al., 2013, p. 12). In response to this finding, the report recommends that the role of EPCs should be strengthened. In particular, EPCs should be implemented faster, published earlier in the transaction process (e.g., at the time of advertising), made more visible (e.g., with a more eye-catching front page), and made easier to understand (e.g., by using plain language and improving the layout).

Other studies indicate that EPCs have a weak or negligible impact on transaction prices. Murphy (2014) studies the role of the EPC in the

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transaction process of buildings in the Netherlands using an online questionnaire. She concludes that few householders use the EPC during the transaction process and maintains that the EPC will not have the intended impact even if fully implemented. Similar surveys carried out in the UK (Laine, 2011) and Germany (Amecke, 2012) drew the same conclusion: that EPCs only have a modest or negligible impact on price negotiations and the purchaser decisions. Moreover, based on in-depth interviews with homeowners in ten European countries, as well as a large survey among homeowners in five European countries, Backhaus et al. (2011) concluded that the EPCs have a small or negligible impact on homeowners' investment decisions.

The empirical literature thus draws two very contrasting conclusions when it comes to the role played by EPCs in energy conservation. To illustrate, we find the case of the Netherlands of particular interest. In the same country, and at approximately the same time, a large statistical study by Brounen and Kok (2011), using an EPC database, a real-estate database, as well as economic and voting data, indicates that the EPCs are indeed capitalized into transaction prices, while the survey data of Murphy (2014, p. 666) “shows that a higher EPC fails to have a direct influence during negotiation and decision making”.

We suspect that the contrasting conclusions in the literature may originate from the methodological design of the statistical studies. We believe that the alleged positive price effect of EPCs in some of the statistical studies is due to a misspecification of the regression models, and that the apparent price premium of the energy labels therefore captures something else than the labels themselves. In other words, we suspect that some of these studies face the problem of omitted variables being correlated with the energy label.

By utilizing data from the Norwegian real estate market, we are able to test our suspicion by taking advantage of the fact that energy labels were introduced by the government “overnight” on the 1st of July 2010 in Norway, meaning we have a quasi-natural experimental design with pre- and post-label data. For each dwelling that is sold before the implementation of the EPCs in Norway in 2010, our data makes it possible to identify the energy label that the same dwelling was assigned to when sold in 2014. Using the assigned energy label of a dwelling that was resold in 2014 as a variable in a hedonic regression for dwellings sold before the implementation of the EPCs in 2010, we find the same positive relationship between the energy label and the transaction price of the dwellings. That is, the price premium of the energy label seems to be present even before it was implemented. This strongly indicates that the energy label captures something else than the label itself. We also offer an alternative methodological approach, the fixed effect model, where we confirm the lack of a labeling effect. The present paper thus provides evidence supporting our suspicion that EPCs have a negligible impact on the transaction prices of dwellings.

In Section 2, we provide some facts about the energy labeling system of dwellings and houses and its implementation in the EU and in Norway. Next, in Section 3, we describe our data and the hedonic method, with and without time dummies. In Section 4, we present the results of the hedonic approaches and apply the fixed effect method as a robustness check of the hedonic models. Finally, we discuss the findings and offer some policy implications in Section 5.

2. The energy labeling system of dwellings and houses

The Energy Performance of Buildings Directive (EPBD) is the main legislative instrument of the EU to improve the energy performance of buildings (Directive 2002/91/EC). Rooted in the EPBD, the Energy Performance Certification (EPC) was introduced gradually throughout the various member states from 2006. The final deadline for implementing a mandatory energy labeling scheme in member states was 2009. A recast of the EPBD (Directive 2010/31/EU) in 2010 strengthened the role of EPCs in “... raising awareness of better energy performance of buildings by demanding publication of the energy performance indicator of the EPC at the time of advertising a building for sale

or rental rather than only at the time of signing a purchase agreement or rental contract” (Bio Intelligence Service et al., 2013, p. 2).

The EPC is intended to provide reliable information to tenants and buyers about the energy performance of buildings at affordable costs and at the appropriate time. In most of the member states, the energy performance ratings are expressed on a letter scale, for instance, from A to G, where A is very efficient and G very inefficient. As improved energy performance of buildings may increase sales prices and rents, the EPC is supposed to generate incentives among owners to invest in improving energy efficiency (Bio Intelligence Service et al., 2013).

However, the implementation of energy performance certificates has been slow in the EU. The implementation and quality of certification schemes vary from country to country, and it is held that “low ambition in implementation leads to certification schemes of poor quality, i.e., not providing sufficient and accurate information or the necessary quality control” (Bio Intelligence Service et al., 2013, p. 18). The adoption rate of EPCs varies from 10% (Cyprus) to close to 100% (Portugal, France). However, it should be noted that even in countries with high adoption rates, the EPC is often provided too late in the decision-making process to have an impact (Bio Intelligence Service et al., 2013). Another concern may be to what extent the EPCs provide reliable information. Burman et al. (2014) provided evidence of a gap between actual energy performance and the standardized and theoretical energy performance.

Based on the EU's EPBD, the Energy Labeling System for Houses and Dwellings was fully implemented in Norway in July 2010. The Ministry of Petroleum and Energy together with the Ministry of Local Government and Regional Development had overall responsibility for its implementation, while the Norwegian Water Resources and Energy Directorate was appointed the managing body of the certification and inspection schemes (Isachsen et al., 2011).¹ The energy performance certification was fully mandatory from the beginning; that is, since July 2010 all transactions must be accompanied by an EPC.

The EPC is a legal document and it is required that it is presented for the buyer. However, as noted by Isachsen et al. (2011, p.2), “parts of the certificate, for instance the Energy Label, can be used as a short version.” The document contains, among other things, data identifying the building and the agent responsible for issuing the certificate; the energy label that indicates the energy grade (representing the calculated delivered energy need) on a scale from A to G and the heating grade (representing to what extent heating of space and water can be done with renewable energy sources), which is represented by color; advice on energy that can save energy; and some general recommendations to the buyer (Isachsen et al., 2011).

The certification scheme in Norway is characterized by a self-assessment option for owners of existing apartments and buildings. In most cases, these certificates will be more general than those carried out by experts. The cost associated with the certification process for existing buildings is typically at least NOK 1000.² This includes the energy assessment itself and the extra cost of advertising for sale when energy label information is included. However, for new buildings, a qualified expert is required for certification, and it is hence a more costly process. The quality assurance aspect of the Norwegian certification scheme is monitored by the Norwegian Water Resource and Energy Directorate (NVE), where faulty inputs are considered a breach of contract. In such cases, a fine is issued. The NVE carries out a systematic supervision of whether EPCs are presented at sale, whether the EPCs represent the building object, and whether experts meet the competence requirements (Isachsen et al., 2011).

¹ From 1st of July 2016, Enova was appointed the managing body of the EPC system in Norway.

² NOK 1 ≈ € 0.11 (per 28.11-2016).

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