# Energy Performance Certificates as tools to support and track renovation activities

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## Keywords

energy performance certificates, Energy Performance of Buildings Directive (EPBD), financing, financial incentives, renovation, quality, policy recommendations, policy

## Abstract

Energy Performance Certificates are mapping out the energy status of the European buildings stock. Their main objective is the transformation of the European buildings stock via market mechanisms. Currently EPCs contribute to raising awareness of the energy performance of buildings directed for renting or selling. This paper outlines recent developments and showcases the possibility of EPCs becoming information tools to support building owners, policy-makers and the finance and business sectors in upscaling energy efficiency renovations. It is shown how building owners are benefiting from fiscal measures to invest in renovation activities; how policy-makers make use of statistical EPC information to optimize policies; and how businesses and investors are seeing EPCs as sources of data for the marketing of products and services that promote energy efficiency refurbishments. Finally conclusions are drawn and recommendations made on further actions to transform EPCs into highly useful tools for promoting renovation activities.

## Introduction

There are a number of barriers that obstruct the expansion and intensification of renovation activities, and by extension the potential energy savings in buildings that will allow society to enjoy multiple co-benefits such as energy security, employment, growth, climate change mitigation and increased comfort levels. Three main groups are identified here as having an important say in the uptake of renovations. The first one is the building owners or building managers whose property can be renovated. The second group are policymakers and government-related stakeholders, which require significant sources of information to design effective policies targeting the required renovations in the built environment. The third group is a the financial sector comprising of banks, investors, businesses, banks or hedge funds that look into longer-term secure investments.

Owners are often not interested in renovation their buildings solely for energy efficiency purposes and research shows that a number of psychological factors influence these decisions (Abrahamse, 2005). Energy efficiency is not attractive enough as an investment due to imperfect information, misperceived energy costs and biases towards energy savings. Additionally owners and tenants have often split incentives on the uptake of renovation activities and often find lack of regulatory and/or financial support for these activities (Austin, 2012).

Policymakers are tasked to develop policies addressing this issue but often find themselves against issues such as those of incomplete data, lack of a clear view of the situation and consequently have to take decisions under high uncertainty and design policies with questionable outcomes. Pooling of knowledge is often incomplete as not all parts of society get equal representation in their decisions and often important blind spots are not addressed.

Investors and businesses have the funds and the willingness to invest in profitable projects and while the case can be made that there is a lot to be save from renovation in terms of energy costs, certain important details still remains uncertain, such as

payback periods, the risk of investment, the level to which their activities can be bankable and securitised etc.

It is clear that there are strong interdependencies between the three groups. Namely, businesses and investors require a robust regulatory framework under which to operate that provides certainly for their activities. Financial institutions and businesses are both willing to work together and yet there is a need to better align the projects to receive financing through government-backed schemes that reduce risk to acceptable levels. Policymakers on the other hand, especially the ones in office, often need to be convinced by the public to support renovation activities and direct efforts, policies and therefore funds to these purposes. The public requires well performing business and availability of financing schemes that trigger their decisions as often the biggest potential for energy efficiency resides in households with difficulty to access financing.

Despite the clear economic gains to be gained from energy efficiency upgrades, we are observing a market failure as even the most profitable measures are rarely taken up. It is clear that a free market has its limitations when it comes to the objective of renovating buildings despite all the economic, social and environmental gains of such actions. The market therefore requires a guiding regulatory framework the will allow it to operate as intended.

All the barriers have an important component of lack of information and it is there exactly where EPCs are able to provide solutions to the interconnected issues faced by renovation activities. EPCs introduced with the EPBD (2002/91/EC) aim to serve as information tool and market transformation mechanisms; with the EPBD recast (2010/31/EU) the quality and recognition of the scheme was upgraded to a level that helps address many issues. For policymakers they could become a source of buildings data to get a very good overview of the problem and design policies to the extent necessary to target the issue it the appropriate degree. Owners could through their EPCs be provided with links to funding opportunities, or directed to one-stop-shops linking them with businesses running innovative business models that deliver renovations and energy savings at no additional costs to the owner. Renovations can provide an alternative to the diminished output of the construction industry, while new entrepreneurs could enter the market with more appealing products this creating a healthy environment of competition. The financial industry eventually can find a support benchmarking tool to invest its capital and be guaranteed secure returns that can refinance further activities.

It is very significant that the quality, acceptance, reliability and recognition of EPCs and enforcement of the EPC scheme in general, are established through regulatory measures. Quality assurance processes and independent verification, linking of EPCs with renovation schemes, visibility in sales advertisements and obligation to be provided to tenants are efforts that have the ability to set the trajectory and the conditions in which society will operate to deliver the multiple benefits of deep renovations.

This paper examines the current role and usefulness of EPCs for three groups, namely building owners, policymakers and businesses & investors. More specifically we are examining whether EPCs have changed market trends by influencing buying decisions; whether the establishment of databases has helped with policy formulation, and; whether businesses and the financial industry see any use of EPCs when investing in energy efficiency renovations. Finally it is assessed whether EPCs live up to their purpose, and what should happen to make EPCs more useful. This paper presents concrete examples to showcase the advantages and pitfalls of using information from EPCs in public renovation programmes, in policymaking and in market decisions.

All finding presented in the following paragraphs originate from BPIE's survey in 2013/14, recent publications on EPCs and complementary interviews with stakeholders in the financial industry and in the business community focusing on renovations.

## EPCs as a tool to support renovations

The findings on the usefulness of EPCs in informing actors, influencing decisions and increasing the energy efficiency of the buildings stock is hereby assessed for the three groups mostly relevant with the uptake of renovations: Owners, policymakers and the relevant business and finance industries.

### GROUP 1: OWNERS

Owners and managers of properties have traditionally not paid much attention to the energy use of their buildings when making purchase decisions. A survey by the Climate Policy Initiative (2011) of 662 resident owners who purchased their property between 2009 and 2011 in Germany, found that EPCs played a limited role in their decisions. While most of them were aware of EPCs, their meaning and use, and while they did consult it during their search, only a fraction remembered the information or found it trustworthy enough to take it into account. This perception is related more to the habituation with the EPC as a tool rather than with its actual precision. Recognition of EPCs is expected to increase following the requirements of the EPBD recast, which led to an obligation for EPCs to be included in advertising as of January 2013. A major downside in the design of EPCs that appeared through the aforementioned survey is a lack of information on the financial implications of owning a residence of a certain energy class.

Later evidence published by the European Commission (2013) suggests that EPCs have had a positive, yet limited, effect on housing prices. With analysis carried out for 10 cities, it was found that a one letter improvement in the energy class increased the property value by 0.5 % to 10.5 %. However, it states that these results are limited to regions with a long history of implementation and that the full potential of EPCs has not yet been reaped. Further research by Hyland et al (2013) on the Irish property market leads to the conclusion that energy efficiency renovation positively influence property both rent and sale prices. For example compared to a D rating, the price premium for A rating is 11 % and for B rating is 5.8 %. On the contrary, F or G ratings reduce property value by 5.6 %.

Owners however are being increasingly attracted to public programmes that aim to increase the energy efficiency of residential properties. Greece, for example (Mathioudakis, 2014), has mobilised public and private financing to achieve renovation in the residential sector through the programme "Energy Saving at Home". The programme is running since 2011 and targets buildings with an energy class of D or lower. It offers co-financing in form of grants according to income, while all

participants are eligible for interest free loans. Energy interventions are advised and verified by accredited energy experts and are supported by ex-ante and ex-post energy inspections. Loans are capped and two thirds are provided through private banks, and 35 % through the State's structural revolving funds. It is noteworthy that the programme was revised twice to attract public interest. Grants linked with proven increases in the energy performance of a dwelling have also been provided in France (Impot Sur Le Revenu – 2013) and Portugal (Fundo De Eficiência Energética 2012). As with the example of Greece, an expert is required to assess the property and provide recommendation of the most suitable measures to be undertaken.

In Austria, building owners benefit from the renovation programme "Sanierungsscheck für Private Mehrgeschoßiger Wohnbau" (BMWFW, 2014) translating as Renovation check for multi-storey private housing. It covers up to 30 % of eligible investment costs up to 7,000 euro and fully covers (up to 300 euro) the expenses of an EPC, which is a pre-requirement for financing and the basis for the renovation measures to be undertaken. Furthermore, during the application phase and as evidence of a prospective increase in energy efficiency, there is also a requirement for an EPC assessing the building's energy efficiency class after the implementation of the planned.

In the period 2005 to 2010, Lithuania (World Bank Group, 2014) offered low-interest loans of about 3 % for energy efficiency refurbishments in multi-family residential buildings. The loans were ranging from 15 % to 50 % of the value of all eligible works and in order for them to turn into a grant, the beneficiary had to prove, through the information provided in an EPC, that renovation activities achieved at least an energy class C for the building. The state subsidy was possible at the period due to the country's high growth rate. The programme resulted in the owners of 375 buildings deciding to renovate their properties and achieve energy savings of 30 %–46 %.

#### GROUP 2: POLICY MAKERS

Information from EPCs has been used in policy-making in order to improve the building regulation including targeted subsidy programmes. In France the managers of databases are providing input to the decision making process of the upcoming energy efficiency policies. Energy efficiency funding schemes are tied with EPCs in Ireland and Greece in order to make better use of public funds through aggregated information collected though databases were EPC information is uploaded.

What is increasingly observed is that statistical information derived from EPC databases is presented in reports of government agencies that are routinely taken into account for policy formulation. The French manager of the database, ADEME, supports that that it is a techno-economic tool to describe the state of the market for energy renovation of housing. BPIE in interviews with ADEME identified that France has used such information to inform local authorities and policymakers, to analyse housing quality, to improve subsidy programmes, make targeted retrofit investments and promote support schemes in the process of designing policies. ADEME (2013) conducts studies that annually measure trends and developments in the energy performance of buildings and provides support to the national policy frameworks is committed to reducing energy consumption and associated emissions, especially through advising the Plan for Home Energy Renovation. It assesses the impact of the energy policy in the residential and tertiary sectors in relation to European and international commitments. Its' Buildings Figures publication (ADEME 2013) based on 2013 data considered over 80 % of the EPCs in the database.

In Ireland, aggregate data have been utilized to realise publications (SEAI 2011) on the energy efficiency of buildings. This type of work assesses progress of buildings-related policies and quantifies their effect. EPC information from the database feed into model calculations that explore potential policy developments and create an evidence base for legislators to use in their decisions. EPC databases therefore have increased value in evaluating progress and delivering energy policy.

Similarly, in the Italian region of Friuli Venezia Giulia (ARES, 2014) EPCs are monitored and a number of aggregate statistical information is published relating to building types, energy classes, energy installations, etc. The regional database is used as an important tool to monitor the energy characteristics of the housing stock in the region and to identify the measures to be promoted to improve the energy efficiency of buildings. Municipalities have access to the database so that they are informed of the energy performance of the real estate in the area where measures are being considered.

The UK is considering the use of EPC data from databases to assist in regulatory development. In its Impact Assessment (DCLG 2012) for making EPC information available to the public, the Department for Communities and Local Government acknowledges that access to energy efficiency data will "provide government, local authorities and researchers with the data they need to support better informed policy making, intervention and enforcement and also enable a wider range of organisations to undertake detailed monitoring and analysis". Accordingly, in the October 2014 guidance (DCLG 2014), a number of details regarding data availability are put forth that govern who has the right to access the data, for what purposes, for which geographical area and so on. It stands out that this openness in data availability has as its main purpose to identify areas where policy can be used to increase the uptake of energy efficiency in buildings.

#### GROUP 3: FINANCE AND BUSINESS

The financing industry and business community have a lot to gain from the mainstreaming of renovation activities. Energy efficiency refurbishments are a very secure, long term investment with extremely stable cash flows and low risk. Currently, according to the European Commission representatives (Bullier, 2014), there is interest from both business and from financial institutions to invest, but essential information on how to link projects with financing is lacking. EPCs could potentially prove useful instruments for providing necessary information for renovation and allow for a more streamlined estimation of financial figures by financing institutions.

The financial industry and businesses can draw lessons from the case of Lithuania who continued to provide support to homeowners despite an ensuring negative financial climate. The Housing Modernization Program was established after 2010 through JESSICA, a joint financial instrument of the European Investment Bank (EIB) and the European Commission that made use of the European Regional Development Fund (ERDF). The resulting fund was managed by state authorities and commercial banks offering 3 % loans repayable over 10 and

20 years. Support in this case as well required proof through EPC information that the renovated property had reached at least energy class C (World Bank Group 2014).

In personal communication with the EIB personnel active on financial instruments in Western Europe, it was stated how "EPCs would need to increase their reliability and guarantee a minimum amount of energy savings". This requirement derives from the observed discrepancies between energy classes and the actual energy savings. Furthermore, they should be backed up by "an institution with a good credit rating providing guarantee on those certificates". It is therefore expected that the ability to be held accountable for the estimated values will affect the credit rating of an EPC and potentially turn them into trustworthy documents accepted in the financing of energy efficiency.

The views of ESCOs are reflected in a personal interview with RENESCO that has identified house owners as "the most credible people to provide secured cash flows after renovation activities". Structural funds have been utilised on many occasions and financing has allowed the interviewee's company to energetically upgrade many soviet-type multi-family buildings in Eastern Europe up to modern standards. However, the same actor identifies lending as an issue that requires further attention: "Small scale developers often lack the financial resources to move because their investments are stuck in assets that repay slowly over time." Institutional capacity might often be lacking thus hampering the scaling up of activities. In this occasion EPCs were not identified as very useful other than for the purpose of providing proof of works. Contrary, "ESCOs are required to undertake energy assessments with stricter standards compared to an ordinary EPC assessor, because their eventual cash flows depend on those assessments and risks should be minimised". Therefore, according to the interviewee, EPCs need to reach a level of accuracy comparable to the energy audits of ESCOs if they are to be considered in the financing of renovation activities.

In an effort to enhance investment in the build environment, the European Commission set up the Energy Efficiency Financial Institutions group, or EEFIG, which came up with proposals affecting buildings renovations that include the use or reliable EPC information. What is required is that EPCs are standardised through clear and replicable methodologies that are able to provide the required information to investors in a harmonised fashion. Strong regulation governed by stability and successful enforcement is key for the adoption of EPC as information tools if they are to be incorporated in investment decisions involving established mechanism such as the EU Structural and Investment funds that leverage private investments. Overall, the group highlights the importance of EPCs by financial institutions through proactive engagement and continuous improvement of their use (EFFIG 2014).

The International Energy Agency (2012), points to information failures concerning basic data requirements by potential investors on the building stock and its energy performance. Increased data accuracy through EPCs is important to make the business case and secure financing from investors and financial institutions. The EFFIG group suggests that a clear signal should be sent to investors who aim for high standards that incentives will be available, such as soft loans, fiscal benefits, etc.). Additionally, this type of support should be linked to EPCs as verification of the achieved benefits but also as planning tools that provide information on financial and technical considerations relating to the risk involved with renovation activities.

The World Energy Forum (2011) identified that in addition to specific certificates, there is a stated need for international comparison of energy ratings. Therefore a cross-border framework to provide energy efficiency ratings is required by holders of international real estate portfolios in order for the relative energy performance to be understood across political borders.

Businesses are progressively expected to choose more and more energy efficient buildings. The World Green Building Council (2013) supports that buildings with increased sustainability credential secure tenants despite their demanding price premiums. Similarly, the energy label achieved following the inclusion of residential buildings into the KfW loan programme of Germany is now used in advertisements as a recognisable selling point (IEA 2012).

Member States are making efforts to assist businesses with delivering energy efficiency on buildings. The example of the UK's revision of its secondary legislation for making information of the EPC database publicly available, even down to the address-level, offers many opportunities for businesses. It is proposed by the Department for Communities and Local Government in its Impact Assessment that it could be possible for businesses active in the field of energy efficiency to target poor energy performing properties and offer their services supported by programmes such as the Green Deal. Portugal has created a market pull mechanism by releasing a manual (ADENE 2013) with voluntary advertisement guidelines to be used by real estate agencies for harmonising EPC display information. The real estate property directory is used in conjunction with the central database where all the information from EPCs is collected. Thus, reals estate agents can complement advertisements of properties with information that appeals to energy conscious potential buyers.

## Conclusions

EPCs have been used in renovation programmes successfully mainly as a tool to propose renovation measures and verify the energy upgrades against the requirements of the program.

Awareness regarding the energy performance of buildings in the EU is steadily rising along with their quality. Owners are reporting knowledge of energy performance, EPCs are being featured in advertisements and energy efficient properties secure a price premium.

Owners are more likely to undertake renovation activities of their properties when supportive mechanisms are present. It is important that the implementation of renovation activities provides incentives to owners according to income, includes revolving funds, decreases bureaucratic procedures and is linked with EPCs.

Policy-makers have utilized EPC data in the design of policies after taking into account aggregate information from EPC databases. This information has been used mainly as input to optimising renovation and financing programmes. The trend is that this type of statistics will be increasingly used in policy design.

Businesses are increasingly acknowledging the importance of buildings' energy efficiency across sectors and activities, al-

beit at low rates. A building's energy class is becoming recognisable for choosing offices; in designing renovation projects, the choice of buildings with most energy savings is key to business success. Most importantly, access to anonymized information of buildings through the EPC databases provides businesses with clear targets to contact and optimise their strategies.

The finance sector is coming on board through public-private dialogues and is suggesting the means that will allow investors to funnel funds into energy efficiency projects. Standardisation of EPC calculation methodologies and inclusion of econometric parameters as outputs is becoming an increasingly important theme in the finance industry's requirements. Cross boarder comparison of assets is also considered important for investors to reach investment decisions.

## Recommendations

**There is a need to improve reliability of the EPC scheme through enforcement and monitoring.** EPCs are the means to bring awareness to the general public, policy makers and businesses of the possible economic benefits of energy renovations. EPCs, as the Trojan horse of energy efficiency in buildings, are threatened by poor implementation that causes negative publicity and endangers the reliability of the scheme and undermines the likelihood of increased economic social and environmental benefits. It is important for policy-makers to pay attention to the early stages of setting up the EPC schemes, to education and competence of certifiers, to the methodology and standards to be followed in calculating an EPC and of course to the overview of certifiers through checks on EPCs and thereby their performance.

**European legislation should link EPCs with renovation policies and programmes.** All buildings-related aspects of public financing programmes, such as Cohesion Funds, should include EPCs in eligible expenses and rely on them for providing a list of recommended renovation activities and as proof that the target savings have been achieved. The EPBD states in its provisions that public authorities and other institutions which provide measures of a financial nature could link the application of such measures to the indicated energy performance and the recommendations from energy performance certificates. Indeed, as recognised in the examples set forth in this paper, the abovementioned provision has been followed on a number of occasions. In the revision of the EPBD, linking EPCs with financing should be mandatory, provided that robust standards are set concerning their methodology. National legislation should follow by example and make use of EPC information in the development and evaluation of national renovation programmes, relevant buildings-associated transactions, city planning and urban renewal projects.

**The European Commission should intensify its efforts to link renovation projects and financing.** Currently there is a plethora of developers with projects targeting renovations, and a number of financial institutions willing to invest in building's energy efficiency. Despite their willingness, an opportunity in benefiting from energy and cost savings is being missed due to a market failure. Therefore, regulatory intervention is required to address this issue and the role of EPC-provided information has to be better explored.

**EPC calculation methodologies and standards must be decisively upgraded to include reliable econometric information.** Since the financial concerns of buildings owners and renovations' financiers govern most investment decisions, an EPC should be able to provide a narrow range of accurate figures on the economic benefits of renovation activities such as the rate of return and expected payback period. These indicative figures are expected to increase the willingness to invest and in time could come to be accepted as highly trustworthy documents by financial institutions following the development of a renovations market.

**Strengthen the quality assurance mechanisms for EPCs.** Special attention should be given to certifier requirements to make on-site evaluations, follow adequate training, etc. and to the EU wide harmonisation of professional requirements and recognition. Furthermore, IT resources such as the software used and the EPC databases should make use of possible interconnections, especially for the purpose of assessing the quality issued EPCs.

**Develop central EPC databases and make use of co-benefits.** Gathering of information offers many useful applications. First of all, EPC information should be used in ensuring the reliability of the EPC scheme through monitoring that leads to increased compliance. It is possible to gather detailed information on the buildings stock that when selectively aggregated is valuable for policy-making. Integrated government planning is also possible when information is also provided to other government agencies. Finally business interests can make use of the amassed information in favour of buildings energy efficiency. Amongst all these benefits, it is highly important to secure privacy since it has been identified as a sensitive issue and reason or opposition to central data gathering.

**Significant improvements are possible for policies after using input from data collected in EPC databases.** The aggregated information on the building's stock, collected centrally by uploading parameters for each building, is a highly valuable source of information to be used in policy development. EPC databases (or registries) address the issue of lack of information -that is all too often an obstacle to effective policymaking- and allow for the accurate design and precise monitoring of policies that increase the building's stock energy efficiency.

**Businesses should be allowed access to bulk, anonymised data with increased privacy protection.** Entrepreneurship has been identified as a key driver of economic development with the potential to upscale energy efficiency in buildings. Business development requires accurate market research to estimate the potential and devise strategies of how to capitalise on provided services. Access to bulk EPC data, guarded with the tightest constrains in favour of privacy, increases the effectiveness of businesses in bringing better energy efficiency-related services to the renovations market.

**The EU should encourage the advertising of EPCs in Member States.** In addition to developing EPCs as a measure to increase awareness of energy efficiency, it is also important to continue its promotion via popular advertisement channels until they become established. Furthermore, educational programmes and information gateways for professionals using EPCs should be easily accessible in order to disseminate updates relating to the usefulness of and links through EPCs, for example to new renovation programmes, related e-platforms and more.

**Use future EU legislation for improving EPCs and enhancing their contribution to the transformation of the buildings stock.** The third EPBD, expected in 2017, should build on the experience of the previous two, use the lessons learned and make use of civil society and business input on how to significantly upgrade the reliability and usefulness of EPCs. As a goal, EPCs should encourage the deep renovation of the EU buildings' stock and support the increase of renovation rates to more than 3 % per year.

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