

Energy performance certificates in buildings and their impact on transaction prices and rents in selected EU countries

FINAL REPORT

European Commission (DG Energy)

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Chapter 7: France

7.1 Assessment of the EPC scheme

7.1.1 Presence of the label

- a) *When did the scheme come into force for which segments of the property market?*

Table 15: Introduction of EPCs in France³³

Property type	Date of entry into force
Residential and non-residential buildings – sale	September 2006
Residential and non-residential buildings – rent	July 2007
New buildings	July 2007
Public buildings	January 2008
Display of the certificate in all property advertising	1 January 2011

- b) *What is known about the proportion of properties (as a proportion of total rental or sales transactions) that were actually certified?*

Notaries are obliged to verify that all the legal documents are present including the EPC (known as *diagnostique de performance énergétique* (DPE)). This suggests that since 2007 the compliance level has been almost 100% at the time of sale. The notary does not have the same role when it comes to rental contracts but the interview suggested that estate agents are well informed about the EPC and are also obliged to make sure that all relevant documents accompany rental contracts.

What may fall outside of this picture are rental transactions concluded between individuals. No information was available about the proportion of rental transactions that are concluded directly between individuals as opposed to via an estate agent.

Thus interview data suggests that the proportion of transactions in France accompanied by an EPC is near complete. However, no studies appear to have been undertaken to verify this. BPIE (2010) estimated that in France 90% of social housing and 14% of private houses have certificates but these shares will have been rising over time. It is estimated that France has issued at least 4 000 non-domestic EPCs (public buildings) (BPIE, 2010).

- c) *What do the regulations say about when the information in the EPCs should be made available?*

According to Concerted Action (2010) in relation to all existing property, the owner is obligated to provide a valid certificate to the buyer when the sale or rental is being established. This

³³ Concerted Action, 2010 and BPIE, 2010.

suggests that it is unlikely the certificate has been well integrated into the marketing and purchasing/letting process. However, in January 2011 display of the energy label and class became mandatory in all advertising for sale or rent (newspaper, websites, real estate agent agencies, etc.). This would suggest that potential buyers/renters are more likely to be exposed to the EPC early in the transaction process and this was also confirmed through interview.

d) Is there any information available about what actually happens in practice (regarding timing)?

The January 2011 requirements mean that the EPC should be displayed in all advertising and marketing of properties. However, it is one thing for the rating to be available and another thing for it to be presented and explained to the prospective buyer/renter, and for it to be integrated into market decisions.

ADEME and TNS (2012a) specifically asked heads of households about the extent to which the energy performance class attributed by the EPC would be an important criterion in the context of a home purchase or a decision to rent. In both cases the total percentage of respondents who considered this either “quite important” or “very important” had not shifted a great deal since a 2007 study, hovering somewhere between 80% and 85%. There has however been a shift towards more respondents saying that it would be a “very important” criterion as opposed to “quite important”. While this suggests that a significant proportion of French households would consider the EPC important in a decision to rent or buy, these results relate to a hypothetical purchase or rental situation. However, the results do suggest that the level of awareness of EPCs amongst the French public is significant, and that there is at least potentially significant market interest. Also, since the survey was carried out before the display of EPCs became mandatory in all advertisements, it can be expected that equivalent figures today would be even higher.

Additional questions were asked of those who had recently sold or bought a home. The number of respondents to this part of the study was very low and so the results should therefore be treated with caution. Interestingly 37% of sellers report that the EPC rating had either a weak influence (25%) or a great influence (12%). For 58% of respondents it had no influence at all. Of those who had recently bought a home, 44% reported that the EPC rating either had a weak influence (27%) or a great influence (17%). It had no influence on 55% of respondents.

ADEME and TNS (2012b) also examined the influence of the EPC rating on sales transactions in the residential sector through a survey of property professionals (estate agents and solicitors). If a property has a good EPC rating, 66% of estate agents and 84% of solicitors say that they “often” or “always” include a good energy rating in their “sales pitch” for that property. On the other hand, when the property has a bad EPC rating, 49% of estate agents and 37% of solicitors say that the buyer will mention this. This suggests that property professionals are wiser to the use of the EPC in the process of negotiation than prospective residential buyers. According to 32% of estate agents and 29% of solicitors, a good EPC rating increases the price of a property by “a little” or “a lot”. Conversely, 53% of estate agents and 46% of solicitors say that a bad EPC rating reduces the price of a property “a little” or “a lot”. In both cases, the largest proportion of professionals say that the impact on the transaction price is to reduce/increase it by “a little”.

Property professionals were also asked whether a good or bad EPC rating influenced buyers’ decisions. According to 72% of estate agents and 66% of solicitors, a good EPC rating influenced

buyers' decisions "a little" or "a lot". For a bad EPC rating the equivalent figures are 63% of estate agents and 58% of solicitors. Again, the overwhelming majority of these responses referred to a small influence. Nevertheless, the survey of professionals suggests that the EPC is entering the professional practices of estate agents and solicitors, that buyers are to a certain extent wise to it, and that it is mobilised both as an argument to increase the price of a property, and to reduce the price in the final stages of negotiation (a practice known as "chipping"³⁴).

This suggests that the EPC is integrated relatively early in the purchasing process of the buyer in the residential sales market. According to the national policy maker interviewed, this is also the case for non-residential buildings and for rentals.

7.1.2 Understanding of the label

a) *What information is available about buyer/renter understanding of the EPC?*

ADEME has conducted three studies so far of the reception of the EPC by the general public and by property professionals (estate agents and solicitors). The first study was in August 2007, another followed in May 2010 and the most recent was conducted in January 2012. Although the survey of professionals asked about understanding of the label, the survey of heads of households did not. Nor was there a survey of commercial investors/occupiers. The survey of the understanding of the EPC by property professionals will therefore have to serve as an indicator of what the understanding of prospective clients (whether for residential or office space) might be.

Some 63% of estate agents and 72% of solicitors agree with the statement that the EPC is "simple to understand and explain", while 56% of estate agents and 32% of solicitors agree with the statement that it is "easy to apply and implement". These results suggest that key property market professionals understand, or at least believe they understand, the EPC. However, there is some room for improvement both in terms of the capacity to understand and explain the EPC, and in terms of its application in particular professional contexts. Interestingly, the survey addressed to households did not ask questions about the understanding of the EPCs.

As in many other countries, there is a national communication campaign, a network of 500 experts providing advice to households on all aspects of energy via the *Espaces Infos Energies* created by ADEME.

7.1.3 Concern about energy use and environmental impact when selecting a property

a) *Is there any information available about the role of energy use or environmental impact as dimensions of property selection?*

An Ifop survey in March 2010 found that 90% of the French public consider energy performance to be an important factor. However, a survey of French real estate agents in June of the same

³⁴ See www.fridaysmove.com/property-law-blog/conveyancing-insider/13/01/2011/epc-used-selling-price-negotiation.

year showed that when it comes to the crunch the share of actual purchasers that consider good energy performance as an important factor in their decision is only 45% (Figures 7, 8).

Figure 7: Factors in purchasing decision according to real estate agents in France, June 2010

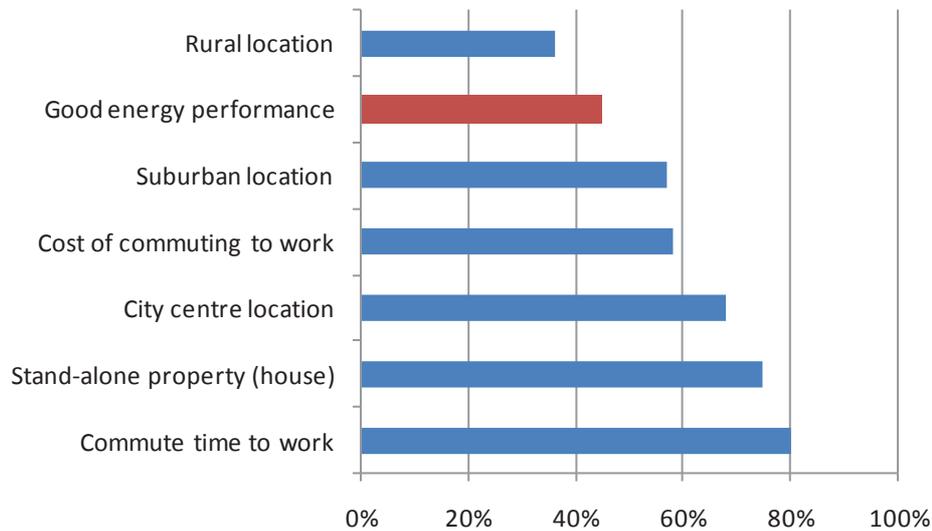
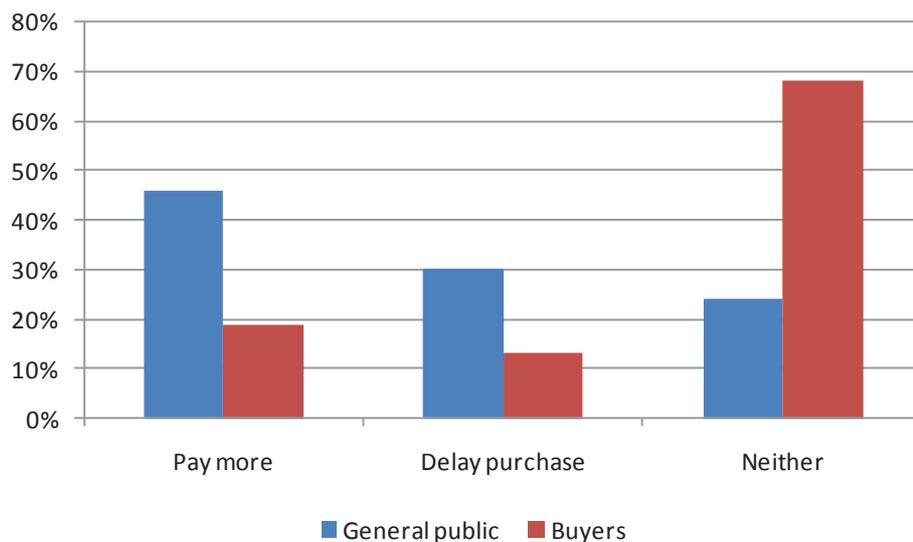


Figure 8: Gap between general public and buyers in attitude to energy performance



Source: Ifop (2010)

- Pay more: Prepared to invest more in order to benefit from a property with good energy performance (or to pay for renovation to improve it)
- Delay purchase: Not prepared to invest more in order to benefit from a property with good energy performance but willing to delay purchase in order to find a property that meets this condition
- Neither: Not willing to delay purchase nor to invest more

More broadly, some of the questions in the most recent Eurobarometer (EC, 2011b) survey relating to Europeans' attitude to climate change can serve as useful context, helping to assess the likelihood of French buyers/renters taking into account energy performance (as a dimension of environmental impact) when selecting a property.

Table 16: Attitudes to climate change in France and Europe³⁵

Question	France	EU-27
% of respondents placing climate change as the most important problem facing the world	20%	20%
Seriousness of climate change on a scale of 1-10 (average ranking)	7.4	7.4
% of respondents having insulated their home to reduce energy consumption	26%	18%
% of respondents having bought a low-energy home	4%	3%

7.1.4 Trust in the information on the label

- a) *Has trust been an issue in the public debate about the introduction of EPCs? If so, what themes have been evoked?*

According to BPIE (2010), the accuracy of EPCs in France has been questioned. This seems to relate to the choice of assessment method and the quality of assessments by assessors. Nevertheless Concerted Action (2010) claims that the creation of EPCs “brought a step change to the market and created improved awareness of energy efficiency in the population.”

Studies commissioned by ADEME and carried out by TNS contain some questions that can throw light on the question of trust in relation to the residential sector. In a survey of the general public (ADEME and TNS, 2012a), those who had recently sold a home generally had not had any problems getting an EPC done and generally had a good impression of the assessors who determine the EPC for a given property. In particular, 82% said that they “rather agreed” or “agreed completely” with the statement that the assessor seemed “competent and reliable.” However if we look at the results from the survey of professionals, the picture that emerges is a little less reassuring. Only 33% of estate agents thought that the assessment of energy consumption and CO₂ emissions by assessors was reliable, while 43% thought that their work often was not as good as it should be. This suggests that the issue of trust in the EPC may undermine the integration of the EPC in market practices so far achieved and hamper any additional integration.

- b) *Are the building blocks of trust in place, in particular in terms of provisions for quality assurance of certification?*

It is not clear if there is any systematic testing of the quality of EPCs in France yet. In 2010, CA-EPBD reported that a central archive for EPCs was under development and that this would help certification bodies “check the proficiency of experts by reviewing the reports provided online and collecting complaints”. In September 2011, the French government announced a series of measures to increase confidence in the EPC. This included greater transparency in the information given to private households, improvements in the calculation methodology, the use of software validated by the ministry, an online database of EPCs, improved competency of assessors and more effective quality control.

³⁵ EC, 2011b. No explanation of the term “low-energy home” was provided to respondents.

Figure 9: Residential EPC, France³⁶

DIAGNOSTIC DE PERFORMANCE ENERGETIQUE – logement (6.A)				
<p>Directive 2002/91/CE du Parlement européen et du Conseil en date du 16 décembre 2002 sur la performance énergétique des bâtiments. Directive 98/34/CE du Parlement européen et du Conseil en date du 22 juin 1998 prévoyant une procédure d'information dans le domaine des normes et réglementations techniques, modifiée par la directive 98/48/CE du 20 juillet 1998. Le code de la construction et de l'habitation, notamment ses articles R. 134-1 à R. 134-5, le code de l'urbanisme, notamment son article R.112-2. Le décret 1114 du 5 septembre 2006 relatif aux diagnostics immobiliers et modifiant le code de la construction et de l'habitation et le code de la santé publique. Le décret 1147 du 14 septembre 2006 relatif au diagnostic de performance énergétique et à l'état de l'installation intérieure de gaz pour certains bâtiments. Arrêté du 15 septembre 2006 relatif au diagnostic de performance énergétique pour les bâtiments existants proposés à la vente en France métropolitaine. Arrêté du 15 septembre 2006 relatif aux méthodes et procédures applicables au diagnostic de performance énergétique pour les bâtiments existants proposés à la vente en France métropolitaine. Arrêté du 3 mai 2007 relatif au diagnostic de performance énergétique pour les bâtiments existants à usage principal d'habitation proposés à la location en France métropolitaine. En application de la loi de simplification du droit 2004-1343 du 9/12/2004, ce diagnostic a été élaboré par un expert indépendant et assuré pour cette mission.</p>				
1. IDENTIFICATION DU BIEN ET DE L'ORGANISME CHARGE DE LA MISSION				
N°:	DPE 09.071	Adresse :		
Valable jusqu'au :	14/10/2019	Cadastrale :	Lot :	
Type de bâtiment :	Immeuble collectif	Date visite :	13/10/2009	
Année de construction :	1974	Accompagnateur :	Locataire	
Surface habitable :	35.00 m²	Organisme chargé de la mission :	A+ Etats des Lieux RCS BORDEAUX 501 613 400	
Attestation d'assurance, RC professionnelle : AXA		Nom du technicien : PIERRE LABERTIT		
Propriétaire :		Propriétaire des installations communes (s'il y a lieu) :		
33000 BORDEAUX		Néant		
2. CONSOMMATIONS ANNUELLES PAR ENERGIE				
Les consommations énergétiques, les émissions de gaz à effet de serre et les coûts indiqués ci-dessous sont obtenus à partir d'un calcul conventionnel méthode 3CL-DPE version 15c, estimé à l'immeuble / au logement, prix moyens des énergies indexés au 15 août 2006.				
	Consommations en énergie finales (kWh PCI)	Energie	Consommations en énergie primaire (kWh)	Frais annuels d'énergie
Chauffage	1 534.26 kWh	électrique	3 958.39 kWh	139.00 €
ECS	1 320.63 kWh	électrique	3 407.21 kWh	119.65 €
Refroidissement	0.00 kWh	pas de système	0.00 kWh	0.00 €
Total	2 854.89 kWh	-	7 365.60 kWh	258.65 €
Abo. électrique	105.87 €	Abo. gaz naturel	0.00 €	364.52 €
CONSOMMATIONS ENERGETIQUES (EN ENERGIE PRIMAIRE) POUR LE CHAUFFAGE, LA PRODUCTION D'EAU CHAUDE SANITAIRE ET LE REFROIDISSEMENT		ÉMISSIONS DE GAZ A EFFET DE SERRE (GES) POUR LE CHAUFFAGE, LA PRODUCTION D'EAU CHAUDE SANITAIRE ET LE REFROIDISSEMENT		
Estimation du montant annuel des frais inhérents à la consommation : 364.52 €		Estimation des émissions : 9 kg $\text{CO}_2\text{eq}/\text{m}^2\cdot\text{an}$		
Consommation conventionnelle : 210 kWh $\text{ep}/\text{m}^2\cdot\text{an}$		Logement		
Logement économe		Faible émission de GES		
<ul style="list-style-type: none"> ≤ 60 kWh A 61-90 kWh B 91-150 kWh C 151-230 kWh D 231-330 kWh E 331-450 kWh F > 450 kWh G 		<ul style="list-style-type: none"> ≤ 5 kg A 6-10 kg B 11-20 kg C 21-35 kg D 36-55 kg E 56-80 kg F > 80 kg G 		
Logement énergivore		Forte émission de GES		

³⁶ Source: www.aplus-expertises.com/images/dpe.png.

7.1.5 Anticipated effect of EPCs on transaction prices and rents

The proportion of transactions that are accompanied by an EPC is high, especially as regards sales transactions. Amongst the general public there appears to be a high degree of awareness of the EPC and of (hypothetical) willingness to integrate it into the choice of a home. There is also evidence that property professionals are integrating the EPC into their practices, suggesting that prospective buyers may have some opportunity to integrate the EPC rating into their purchasing decisions. There is also some indication that this is having at least some influence on the sale price, either upwards or downwards depending on the EPC rating. However, there are clearly some issues of trust in the EPC. Overall therefore, it seems that we might expect a limited positive effect of the EPC on residential sales transactions in France. If we assume that the office sales and rental markets are likely to be more sophisticated than the residential market and integration of the EPC therefore to be further advanced, then all things being equal, we may hypothesise that this effect should also be in evidence in the office markets.

7.2 Establishment of a dataset

The *Notaires*³⁷ hold two databases, one for the Paris region (BIEN) and one for the rest of France (Perval). The two databases are based on the same source: official sales documents signed in notaries' offices. Therefore, they deal only with residential property sales.

BIEN and Perval contain both transaction (sales) data and EPC information. However, EPC information is only available for transactions where the documents are transmitted electronically to the *Bureau des hypothèques* (mortgage registry). In BIEN for example there are 175 000 transactions between August 2010 and July 2011, of which 13% contain EPC information. The Perval database contains EPC information from 2011 onwards, with a similar level of data completeness.

Data is constantly updated and is available for all types of property on the market, listing precise information on location, key features, technical details and transaction prices. The variables include:

- Transaction price
- Address
- Dwelling type i.e. apartment (studio, room, duplex, loft, etc.) or house (detached house, villa, farm, chalet, etc.)
- Number of rooms, bathrooms, parking spaces, etc.
- Surface of the dwelling
- Floor
- Construction period

³⁷ See www.notaires.fr.

- EPC: Energy consumption (A-G) and greenhouse-gas emissions (A-G)
- Total number of variables: 105

The Perval database was used as the source for this study for a number of reasons: first, the Paris market is very tight, which we expected would make the effect of EPCs difficult to distinguish and not easily comparable to other markets; second, within the Paris region there is huge variation in prices over very small distances, which could affect the robustness of results; third, the Perval database would allow us to compare more than one region from the same database. Thus, we obtained datasets of the latest available transactions from the Perval database for both Lille and Marseille to allow comparison of northern and southern climates, and two different sizes of city or urban area.

7.3 Regression results

The analysis for France is based on the Perval database and comprises just under 3 400 sale transactions in the metropolitan areas of Lille (in the north) and Marseille (in the south) between January 2011 and October 2012.³⁸

Information on property type is available for each transaction across seven main dimensions. The first three are the price of the transaction, its date and the INSEE Commune the property is located in. Market conditions are controlled for using quarterly fixed effects. Location-specific fixed effects are described separately for Lille and Marseille below.

The fourth dimension of information refers to property type, of which there are six: standard house, *pavillon*, villa, standard apartment, duplex and studio. The fifth is the property's age (by era: pre-WW1, interwar, post-war, 1970s-1980s, and 1990s-2010s). The sixth dimension refers to property-specific features, such as whether there is a terrace, cellar, balcony, pool, parking spaces, a noticeably good or bad internal condition, or a view that adds to the property's value. The final dimension is the property's energy rating, using an ordinal alphabet ranking from A (most energy efficient) to G (least).

As with other countries and regions, the empirical specification includes a filter for outliers. The process uses a calculation called Cook's Distance to exclude those observations with a disproportionate effect on the estimation of the coefficients of the model (a statistical test for outlier status). In the case of France, this resulted in the exclusion of on average 3% of observations.

7.3.1 Results for Marseille

For Marseille, there were almost 1 350 transactions analysed, comprised of 1 200 apartments and 147 houses. With a median number of observations per zone of 70, each of the 16 different INSEE

³⁸ The original dataset contained just under 3 900 observations. Exclusions were made for missing price, date or size information, and also for unusually large or small properties, and for non-standard property types (anything other than *maison*, *pavillon* or villa for houses, and anything other than *appartement standard*, duplex or studio for apartments).

communes had a sufficient number of observations to be treated separately in the regression analysis.

Capturing location-specific fixed effects was done through use of area in square metres interacted with an indicator variable for each commune. The inclusion of an additional 15 variables (Marseille commune was used as the control) enables not just for one area to have a differential relative to another (as with fixed effects) but for that differential to vary by the size of the property.

Overall, the model explains 86% of the variation observed in property prices, as shown in Table 17. Most variables have statistically significant effects with the sign as expected, with a higher price associated with newer properties, houses (relative to apartments), properties with a terrace, pool or parking space and larger properties.

There is a strong positive relationship between energy efficiency and the price of the house: each one-letter improvement in a property's energy label is associated with a 4.3% higher price. Regressions run separately for apartments and houses suggest that the energy efficiency effect is driven by apartments – with no statistically significant effect of energy rating on the price of a house. Caution must be exercised when noting this result, however, as the sample of houses in Marseille is small.

7.3.2 Results for Lille

For Lille, there were almost 2 000 transactions analysed, comprised of 1 200 apartments and 746 houses. These were in 62 different INSEE communes but only 16 of these contained 30 observations or more, so contiguous communes were grouped together to form 18 zones of sufficient sample size. The median number of observations per zone was 71.

As shown in Table 17, the model explains more than three-quarters of the observed variation in property values. The difference in prices between houses and apartments is significantly smaller in Lille than in Marseille (this may be due to relative supply differences, which would also explain the smaller sample of Marseille).

Aside from this, results are largely similar in sign and statistical significance to those from Marseille. In relation to energy efficiency, there is a strong positive relationship between a property's energy label and its value, although the effect of a one-letter improvement on value is smaller than for Marseille (3.2% compared to 4.3%). This runs counter to the intuition that energy efficiency would be rewarded more in regions with a greater dependence on energy for comfortable conditions of habitation.

However, separate regressions for house and apartment subsamples throw up an additional result. As with Marseille, one of the two segments appears to be driving the relationship between energy efficiency and property value. In the case of Lille however, it is houses, not apartments: each one-letter improvement in label is associated with a 4.7% higher price, while for apartments the effect is 1.5% and only marginally statistically significant.

Table 17: Results for Marseille and Lille (sales transactions)

Dependent variable: Price	Marseille	Lille
Energy label (A=1, G=7)	-0.04347***	-0.03236***
House:	0.00711	0.00599
of which <i>pavillon</i>	0.88850***	0.23309***
of which villa	0.07192	0.0425
of which two floors or more	0.11161	0.10313***
<i>Apartment:</i>	0.06372	0.02704
of which studio	0.10790*	0.18485
of which duplex	0.04359	0.17049
on 2nd floor	-0.02184	-0.03733
on 3rd floor	0.04096	0.02391
on 4th floor	-0.21423***	-0.03593
on 5th or higher floor	0.02306	0.02842
<i>Property features:</i>	0.21839***	0.09824
Terrace	0.03819	0.0591
Cellar	-0.03685*	0.0253
Balcony	0.01711	0.02337
Pool	-0.02346	0.01358
1st parking space	0.01787	0.0276
	0.02159	-0.06084
	0.02188	0.03351
	-0.04750**	-0.09272***
	0.01809	0.02633
	0.14949***	0.05911**
	0.01794	0.01986
	0.02645	-0.02517*
	0.01358	0.01229
	0.01073	0.03888
	0.01363	0.02698
	0.14045**	
	0.04994	
	0.10297***	0.13474***
	0.01595	0.01335

2nd parking space	0.11281**	-0.01132
	0.03518	0.02515
Good condition	0.03787**	0.03132*
	0.01441	0.01275
Needs renovation	-0.14001**	-0.13668***
	0.0456	0.03991
Views add value	0.01384	0.01795
	0.01969	0.01439
<i>Property age:</i>		
Pre-WW1	0.02324	-0.08502
	0.03288	0.04476
Interwar	0.05047**	-0.04226**
	0.0176	0.01452
1970s-80s	0.08103***	0.05271**
	0.01624	0.01616
1990s-2010s	0.16054***	0.15565***
	0.02236	0.02092
Size (m ²)	0.01587***	0.01311***
	0.00036	0.00042
Additional effect of m ² , if house	-0.00735***	-0.00345***
	0.00072	0.00045
Constant	11.16535***	11.14448***
	0.04685	0.04647
R-squared	86%	77%
N	1 263	1 915

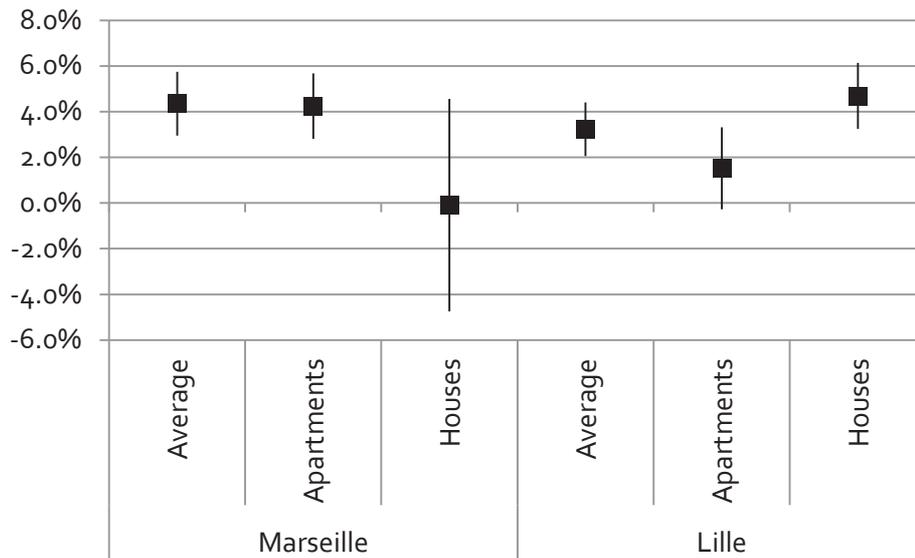
Models as described in the text. Regional square meters effects not shown. Standard deviations are reported in parentheses. ***, **, * denote statistical significance at 1%, 5% and 10% levels respectively.

7.3.3 Summary

Figure 10 shows the estimated effect – and 95% confidence interval – of a one-letter improvement in energy efficiency, across Marseille and Lille. Separate results are shown for the house and apartment segments of each urban area. As discussed above, energy efficiency is not rewarded in the Marseille house market but is in the more temperate Lille market, where a one-letter improvement is associated with a 4.7% higher price.

In the apartment segment, energy efficiency is strongly associated with higher values in Marseille but the relationship is only marginally statistically significant in Lille. This is a result that would benefit from further study, taking in to account the particulars of the market in each city.

Figure 10: Estimated effect and 95% confidence interval of a one-letter improvement in energy rating for Marseille and Lille house and apartment markets overall



Using a pooled regression, it is possible to test whether the difference in effect across cities and segments is statistically significant, or whether it may be due to chance, as a result of small sample size. The pooled regression combines all observations for both urban areas, interacting property attributes with an indicator variable for Lille to allow differentials to vary by city. This analysis suggests that the overall estimated effect of a one-letter improvement in energy efficiency is 3% but that in Lille the effect is smaller, of the order of 1.2%. There is no strong evidence from this model that the effect differs between houses and apartments in either city (this can effectively be seen in the graph above as a horizontal line at 3% would cut through all six confidence intervals).

In summary, there is strong evidence from Marseille and Lille that energy efficiency is rewarded in the French sales market, in particular apartments in Marseille and houses in Lille. The estimated effect of a one-letter improvement in energy efficiency 3.2% for Lille and 4.3% for Marseille. Results would suggest that in the market for houses at least, energy efficiency enjoys a greater premium in the city more dependent on energy for heating, although larger sample sizes are needed for this to be established definitively.