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Public awareness of “green” and “energy efficient” residential property

An empirical project carried out on data from the IMMOWELT program.
(Conference draft; please do not quote without the author's permission.)

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Abstract:

Over the last few years more stringent environmental laws (e.g. the German “Energieeinsparverordnung ENEC” - Energy Performance of Buildings Directive) and soaring energy prices increased the need for the real estate industry to react. Therefore the Property Group at Queensland University of Technology in Australia and Nuertingen-Geislingen University in Germany carried out research in relation to sustainable housing construction and public awareness of “green” residential property; this research resulted 2009 in two different surveys. One of surveys analyzed the situation in New Zealand, the other was focused on Germany.

The purpose of this survey is to examine the buyer awareness and acceptance of environmental and energy efficiency measures in residential property markets. This study will provide a greater understanding of consumer behaviour in the residential property market in relation to green housing issues. Part of this research is to gain an understanding of the level of knowledge and importance of these issues to the house buyer and vendors to determine the importance of sustainable housing to the general public.

This paper is based on a new survey from spring 2010. The paper covers new issues as well as comparing results of this survey with data from two empirical studies carried out by the authors in 2009.

1. Starting point

Climate change and an increased awareness of environmental issues and questions have led to much tougher environmental laws in many countries all over the world. In accordance with the Kyoto treaty and/or own emission targets countries all over the world are working hard to fulfil their environmental obligations (Cf. Tiefensse 2007, Piebalgs 2007, Troge 2007, Thoben 2007)

Over the last few years more stringent environmental laws (e.g. the German “Energieeinsparverordnung ENEC” - Energy Performance of Buildings Directive) and soaring energy prices (Cf. Matthes, 2007) have increased the need for the real estate industry to react and participate in respect to environmental awareness and energy efficiency in the housing sector not just the commercial property sector. Despite the fact that energy prices decreased due to the global recession and the high level of energy prices, it is expected that energy prices might pick up substantially as soon as the current economic conditions improve. When these economic conditions do return to pre-2009 levels saving energy will be high on the agenda of the real estate industry. While new buildings have to fulfil these much tougher regulations, older buildings will also have to be upgraded to live up to both current and any new standards.

During the past 2 decades, there has been a growing awareness and focus on energy efficiency in residential house design, construction materials and efficient heating and cooling. Much of this work commenced in the US in the mid 1980's with the introduction of Home Energy Rating Schemes (HERS) and Demand Side Management programs

There are generally two existing HERS categories and these are either based on a voluntary or mandatory basis. The mandatory schemes are generally based on the construction of new homes, with the voluntary HERS schemes being more focussed on existing houses (The Energy Efficiency and Conservation Authority of New Zealand, 2005).

Examples of voluntary HERS include:

- In Australia the Five Star Design rating Scheme (1984-1986); 1991 the Victorian Government introduced the Building regulations were amended to include mandatory thermal insulation requirements
- The US adopted a national Home energy rating system in 1999 and this is used extensively to assess energy efficiency for new homes, requirements to retro-fit older homes and as a basis for “energy efficient mortgages”. In 1993 only 17 States were offering HERS but this had increased to 47 States by 2000 (Plympton, 2000). However, participation rates in these schemes were very low at 0.2% achieved in 5 years (Farhar, 2000).
- In Canada the national HERS is the EnerGuide and this was introduced in 1998.
- The UK has two energy efficiency rating schemes in operation being the National Home Energy rating Scheme and the Standard Assessment Procedure (SAP 2005).
- The first scheme introduced in New Zealand commenced a trail in 2002 under the Warm Homes Energy Check(WHEC)

The Energy Efficiency and Conservation Authority of New Zealand study (2005) concluded that the participation rate in voluntary, user pays schemes were less than 1%.

On this basis, many Governments are now more focused on the introduction of mandatory schemes to improve energy and heating efficiencies in both existing and new housing stock

In Europe, under Directive 2002/91/EC of the European Parliament and of the Council of 16 December 2002 on the energy performance of buildings, the Member States must apply minimum requirements as regards the energy performance of new and existing buildings, ensure the certification of their energy performance and require the regular inspection of boilers and air conditioning systems in buildings (European Union, 2007). The main points of this mandatory HERS scheme is:

- a common methodology for calculating the integrated energy performance of buildings;
- minimum standards on the energy performance of new buildings and existing buildings that are subject to major renovation;
- systems for the energy certification of new and existing buildings and, for public buildings, prominent display of this certification and other relevant information. Certificates must be less than five years old;
- regular inspection of boilers and central air-conditioning systems in buildings and in addition an assessment of heating installations in which the boilers are more than 15 years old.

In the UK the SAP energy rating system is virtually a mandatory scheme that covers both existing (when undergoing extensions greater than 10m²) and new homes.

The SAP calculation is based on the energy balance of the residential property, taking into account a range of factors that contribute to energy efficiency:

- materials used for construction of the dwelling
- thermal insulation of the building fabric
- ventilation characteristics of the dwelling and ventilation equipment
- efficiency and control of the heating system(s)
- solar gains through openings of the dwelling
- the fuel used to provide space and water heating, ventilation and lighting
- renewable energy technologies. (Canterbury City Council, 2005)

Despite the growing awareness of environmental issues and the impact that household footprints have on carbon emissions and energy use, the introduction of voluntary and mandatory evaluation schemes for housing have to some extent been eroded by the current economic recessions facing those countries discussed above. Although public awareness of environmental issues has been steadily increasing, has this awareness entered into the purchase decision by buyers when considering the residential properties they are inspecting for possible purchase?

In this paper, environmental issues concerning the housing markets in Germany will be analyzed. The attitudes of vendors and buyers concerning environmental questions are reviewed on the basis of a new survey and the two surveys by the authors from 2009 to determine if the drive to more energy efficient and low carbon emission housing is as prominent in the minds of the residential house buyer and residential property tenants, as it is in Government and society in general.

2. Methodology and research design

The following survey, as well as the two green house surveys of 2009 by the authors (Kippes/Eves, 2009), have been targeted to real estate agents rather than actual home buyers, on the basis that real estate agents show a single property to a number of perspective purchasers/tenants and have intensive negotiations with vendors/landlords and therefore gain a better understanding of the features of a house that are more attractive or worthwhile to that residential property market. On the basis of the discussions that real estate agents have with these buyers, they are in a position to provide a more insightful view of the attitude of multiple house buyers to specific house attributes, compared to those held by the house buyers once the sale has been completed or the property has been rented. It is noted that not all house buyers or tenants will be totally honest in relation to their discussions with real estate agents. However, the extensive coverage of agents in this survey negates this concern.

The survey of recent & predicted demand patterns uses the organisation IMMO-WELT. The real estate site IMMOWELT originated from the Data Concept Company, and later on became a joint company of the Holtzbrink, WAZ, and Münchener Zeitungs-Verlag, three of Germany's leading publishing companies. The IMMOWELT program is quite similar to the American real estate sites Realtor.com, Homestor.com or Move.com, or the real estate site of the Real Estate Institute of Australia.

Total population of the survey of recent & predicted levels of demand:

33.305 companies who, according to the German Bureau of Statistics operate in the business of renting, letting or managing third party properties (WZ 70.3 in the Structure Analysis of Service Companies, the German "Dienstleistungsstrukturerhebung").

Share of individual enterprises: 18.779.

Average of persons per company: 5 (94% of the companies are smaller than 9 persons)

Data base of this survey: The address data of companies who are renting, or letting properties, which were either customers of Immowelt or were listed in the data base of Immowelt (25.000 - 30.000 addresses, who are probably equivalent to the Structure Analysis of Service Companies, the German "Dienstleistungsstrukturerhebung"). Since Immowelt is covering all parts of Germany, and all company sizes, there is the same probability for all German real estate companies to become part of the sample.

Quota arrangement: according to the German States, and zip areas

Loading: according to zip areas, and companies sizes (persons working in the company)

Sample: randomized based on regional groups (with quota arrangement)

Random based 15.000 real estate companies were asked to take part in the survey. The survey drew a response of 922 companies. Following the verification of the data there was a sample of 752 real estate agents. The descriptive margins were as follows: margin of error 3.53 %, confidence level 95 %.

Finally the data was weighted according to the zip areas. It wasn't necessary to weight the data according to the company sizes of the German Bureau of Statistics since the deviation would have been minimal.

3. Results of this study

As previously stated in the methodology a survey was carried out of real estate customers of IMMOWELT (real estate agents), and companies in their data base to establish recent demand for residential property & also to establish likely future trends. The tables & analysis of the survey are outlined below.

Table 1: Impact of a good energetic status of a property (existing property)

	total	North (zip code 2)	South (zip code 7,8,9)	West (zip code 4,5,6)	East (zip code 0,1)	Middle (zip code 3)
total	752 ¹	76	206	218	116	48
• sales						
yes, on the length of time of the marketing	234	31	65	73	24	18
	31%	41%	31%	33%	20%	38%
yes, on the marketing expenditures	184	15	52	63	22	14
	24%	20%	25%	29%	19%	30%
yes, on the realized market price	454	52	135	132	59	33
	60%	68%	66%	61%	50%	68%
no, there were no or only marginal influences	174	10	45	46	40	10
	23%	14%	22%	21%	34%	21%
no answer	42	1	7	13	10	0
	6%	2%	3%	6%	9%	0%
	total	North (zip code 2)	South (zip code 7,8,9)	West (zip code 4,5,6)	East (zip code 0,1)	Middle (zip code 3)
• rentals						
yes, on the length of time of the marketing	205	20	59	71	20	14
	27%	26%	29%	33%	17%	30%
yes, on the marketing expenditures	150	9	42	56	18	12
	20%	12%	20%	26%	15%	25%
yes, on the realized market price	366	37	109	112	48	18
	49%	48%	53%	51%	42%	38%
no, there were no or only marginal influences	239	24	62	64	44	16
	32%	32%	30%	29%	38%	34%

¹ The columns don't add up to the total due to the fact, that the data was weight according to the zip areas.

no answer	50	6	9	13	8	5
	7%	8%	4%	6%	7%	9%

Concerning the sale of properties 60% of respondents stated (table 1), that a good energy efficient status of a property (existing properties) had a positive impact on the realized market price.

For a further analysis of the economic situation in the different German regions, five areas (table 1) will be scrutinized, these areas are:

- Northern Germany: zip code 2 (Schleswig-Holstein, Hamburg, Bremen und northern parts of Lower Saxony)
- Southern Germany: zip code 7, 8, and 9 (Bavaria und Baden-Württemberg)
- Western Germany: zip code 4, 5, and 6 (western parts of North Rhine-Westphalia, Rhineland-Palatinate, Saarland und western parts of Hesse)
- Eastern Germany: zip code 0 und 1 (Mecklenburg-Vorpommern, Brandenburg, Saxony, Saxony-Anhalt und eastern parts of Thuringia)
- Middle of Germany: zip code 3 (northern and eastern parts of Hesse, East-Westfalia, southern parts of Lower Saxony, western parts of Thuringia)

The breakdown of this data shows that this preference for energy efficient housing applies to all regions. In every region at least half of the respondents agreed that a good energy efficiency status had an impact on the price level of properties. In the north and middle of Germany the response was 68%, in the south 66% stressed the importance of such environmental features. In contrast to this only 50% in the east considered that the level of energy efficiency was important in property sales.

When it comes to renting a property the impact of a good energy status on the rent is substantially weaker. All over Germany only 49% saw this connection concerning rents compared to 60% in the case of selling properties.

In relation to property sales 24% of the respondents stressed the impact of a good energy efficient status on the marketing expenditures, compared to 20% in the case of rentals.

On one hand 23% stated that there were only marginal differences when properties are sold, with a good energy efficient track record, while on the other hand 32% saw no influence of an energy efficient houses when properties are rented.

Table 2: Even the mere impression of an energyefficiency problem may reduce the price of a property

yes, I agree totally	215
	29%
yes, but not in the case of core-properties	240
	32%
only a certain degree, other features are more important	224
	30%
no, if everything else is OK, this has no or only a minor relevance	59
	8%

no answer	14
	2%

Roughly one third (29%) of the real agents stated that based on their experience (table 2), even the mere impression of an energy efficiency problem may reduce the price of a property, while another one third (32%) agreed but had the impression that core properties weren't affected by a reduction caused by energy efficiency problems. Another one third of the agents think if everything else is OK, energy efficiency problems have no or only a minor relevance.

Table 3: Even the mere impression of an energetic problem may reduce the price of a property by region

	total	North (zip code 2)	South (zip code 7,8,9)	West (zip code 4,5,6)	East (zip code 0,1)	Middle (zip code 3)
Basis	752 ²	76	206	218	116	48
yes, I agree totally	215	27	59	69	25	11
	29%	35%	29%	31%	21%	23%
yes, but not in the case of core-properties	240	31	63	71	32	20
	32%	41%	30%	33%	28%	42%
only to a certain degree, other features are more important	224	14	65	62	43	15
	30%	18%	32%	29%	37%	32%
no, if everything else is OK, this has no or only a minor relevance	59	3	17	13	14	2
	8%	5%	8%	6%	12%	4%
no answer	14	1	2	3	2	0
	2%	2%	1%	1%	2%	0%

While on the average 29% of the respondents agreed even the mere impression of a housing energy efficiency problem (table 3) may reduce the price of a property, only 21% of the respondents in the eastern parts of Germany agreed. This may be caused by the fact that many properties in this region are still lagging behind in the environmental status of the buildings, and therefore an energy efficiency problem isn't unusual. The eastern parts of Germany are on the other hand still plagued by a high vacancy rate, therefore a potential buyer should have a reasonable choice and should have the opportunity to buy a property with a good environmental record.

² The columns don't add up to the total due to the fact, that the data was weight according to the zip areas.

Table 4: Do people who are interested in residential properties ask more about environmental features than two years ago

	sales	rentals
more often	484	323
	64%	43%
unchanged	168	272
	22%	36%
less often	26	66
	3%	9%
no answer	74	90
	10%	12%

Asked whether real estate companies were asked more often concerning environmental features of a property (table 4), real estate agents experienced a clear change within in the last two years.

Table 4 shows that 64% of the property companies reported increased questions of home buyers compared to only 3% who reported that they were asked less often.

In relation to tenants, the change within the last two years was less distinctive than buyers. Compared 64% of the buyers who reported increased questions about environmental features of a property, only 43% of the tenants asked more often about the environmental status of property, while real estate agents reported that 9% of the tenants were less concerned than two years ago.

Table 5: Do people who are interested in residential properties ask more about environmental features than two years ago - properties for sale by region

	total	North (zip code 2)	South (zip code 7,8,9)	West (zip code 4,5,6)	East (zip code 0,1)	Middle (zip code 3)
total	752 ³	76	206	218	116	48
• sales						
more often	484	59	147	143	56	33
	64%	77%	72%	65%	48%	68%
unchanged	168	14	37	50	32	12
	22%	18%	18%	23%	28%	25%
less often	26	0	6	7	8	0
	3%	0%	3%	3%	7%	0%
no answer	74	3	15	18	21	4
	10%	5%	7%	8%	18%	8%

³ The columns don't add up to the total due to the fact, that the data was weight according to the zip areas.

A breakdown by region in Table 5 shows that 77% in the north and 72% of the respondents in the south were more interested in eco-questions, while in the east of Germany only 48% reported an increased awareness.

In contrast to this 3% reported that they had been asked less often. Analyzed by region, 7% in the east told they had been asked less often, while in the other regions only a maximum of 3% did the same.

Table 6: Do people who are interested in residential properties ask more about environmental features than two years ago - properties for rent by region

	total	North (zip code 2)	South (zip code 7,8,9)	West (zip code 4,5,6)	East (zip code 0,1)	Middle (zip code 3)
total	752 ⁴	76	206	218	116	48
• rentals						
more often	323	33	93	103	43	21
	43%	44%	45%	47%	37%	43%
unchanged	272	29	78	74	47	14
	36%	38%	38%	34%	40%	30%
less often	66	5	17	17	16	5
	9%	6%	8%	8%	14%	9%
no answer	90	9	17	23	10	8
	12%	13%	9%	11%	9%	17%

Compared to property sales (table 5) where over the last two years 64% of the respondents who were interested in residential properties asked more about environmental features. Table 6 shows that only 43% did this concerning rentals. As in the case of property sales, the eastern parts of Germany are lagging behind (37%) in respect to increased environmental awareness.

⁴ The columns don't add up to the total due to the fact, that the data was weight according to the zip areas.

Table 7: Percentage of buyers/tenants (residential properties) who inquired within the last 12 month about environmental features

	sales	rentals
0%	10	14
	1%	2%
1-10%	55	131
	7%	17%
11-20%	70	81
	9%	11%
21-30%	59	86
	8%	11%
31-40%	44	50
	6%	7%
41-50%	83	98
	11%	13%
51-60%	51	54
	7%	7%
61-70%	75	48
	10%	6%
71-80%	117	48
	16%	6%
81-90%	78	30
	10%	4%
91-100%	53	17
	7%	2%
no answer	57	95
	8%	13%

The percentage of buyers (residential properties) who inquired within the last 12 month about environmental features (table 7) was higher than the number of potential tenants who asked similar questions. 16% of the real agents reported that 71 to 80% of buyers inquired on environmental issues, compared to only 6% of real estate companies who were involvement in letting properties. 10 % of the real agents selling residential stock were asked in 81 - 89% of cases compared to only 4 % in the case of letting. Furthermore in the case of selling 7% of the agents were asked in 91 - 100% of the cases, compared to 2% of the agents who were renting properties.

Table 8: Important environmental features for selling a house/unit

	essential	important	neutral	quite unimportant	negligible	don't know
south aspect	53 7%	330 44%	187 25%	100 13%	32 4%	22 3%
modern thermal insulation glazing	109 15%	478 64%	105 14%	26 3%	8 1%	7 1%
facades insulation / heat insulation	142 19%	440 59%	122 16%	19 2%	4 1%	6 1%
roof insulation	165 22%	454 60%	92 12%	13 2%	7 1%	5 1%
celler insulation	53 7%	236 31%	271 36%	118 16%	35 5%	5 1%
calorific value boiler (use of the waste gas heat)	60 8%	353 47%	230 31%	59 8%	13 2%	15 2%
geothermal heating	43 6%	164 22%	240 32%	153 20%	80 11%	40 5%
solar thermal energy	45 6%	237 32%	267 35%	95 13%	68 9%	23 3%
photovoltaics	31 4%	137 18%	261 35%	158 21%	100 13%	41 5%
no answer	10 1%					

When asked (table 8) about important environmental features for selling a house/unit facades insulation/heat insulation (19%) as well as roof insulation (22%) were rated as essential. Higher initial cost energy efficiency tools were not considered as important as the less expensive energy efficient measures.

Table 9: essential/important environmental measures for selling a house/unit by region

	total	North (zip code 2)	South (zip code 7,8,9)	West (zip code 4,5,6)	East (zip code 0,1)	Middle (zip code 3)
south aspect	383 ⁵	42	117	101	59	22
	51%	55%	57%	46%	51%	45%
modern thermal insulation glazing	587	59	160	187	76	40
	78%	77%	78%	86%	66%	83%
facades insulation / heat insulation	582	59	152	183	88	38
	77%	77%	74%	84%	75%	79%
roof insulation	618	67	163	189	92	40
	82%	88%	79%	87%	79%	83%
cellar insulation	289	27	71	87	46	17
	38%	35%	35%	40%	40%	36%
calorific value boiler (use of the waste gas heat)	413	50	109	121	56	30
	55%	65%	53%	56%	48%	62%
geothermal heating	207	16	53	70	27	16
	27%	21%	26%	32%	23%	34%
solar thermal energy	282	24	83	89	33	19
	38%	32%	40%	41%	29%	40%
photovoltaics	168	20	40	52	20	14
	22%	26%	20%	24%	17%	30%
	10					
no answer	1%					

Real estate agents were asked (table 9) how they rated the importance of certain environmental measures for selling a house. Modern thermal insulation glazing (78%) as well as facades insulation/heat insulation (77%), and roof insulation (82%) were considered as essential or important. In contrast to this only 22% considered photovoltaics, 27% geothermal heating, and 38% cellar insulation as well as solar thermal energy as essential or important.

There are substantial differences concerning modern thermal insulation glazing in the different German regions. While in the West 86% opted that such a glazing system was essential/important in the region East it was only 66%.

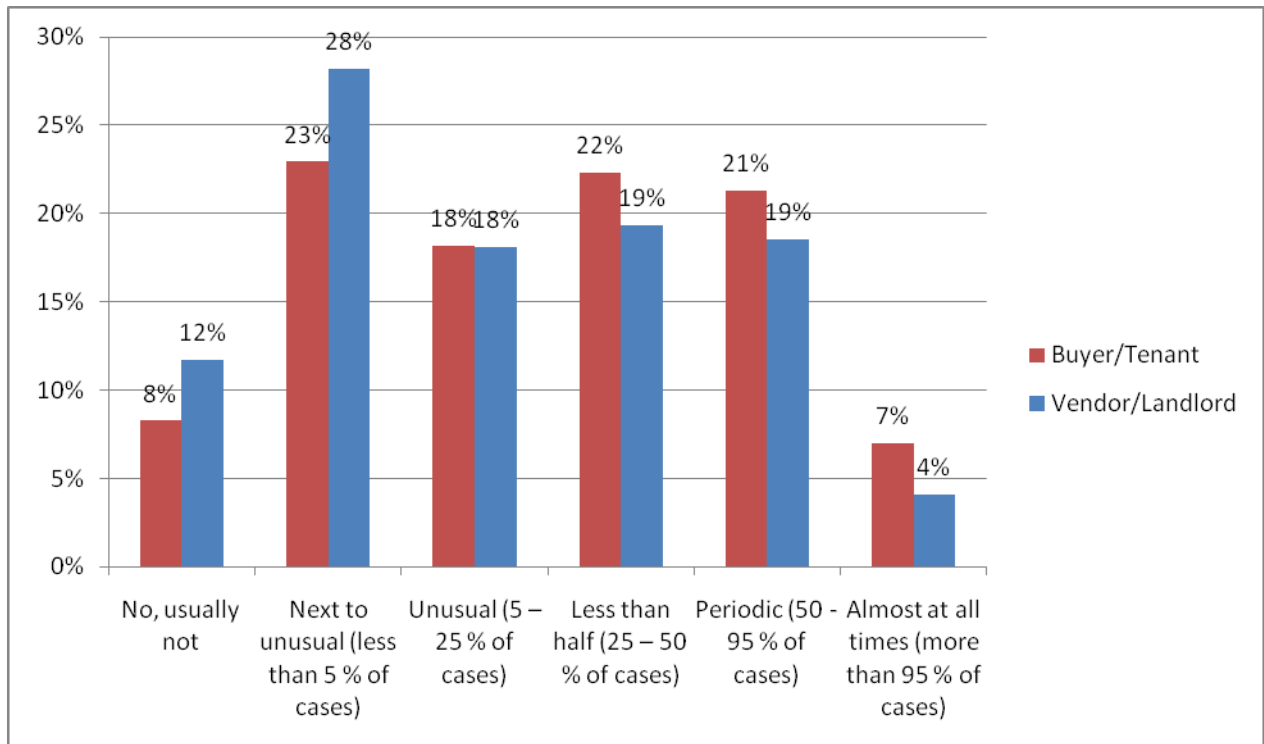
⁵ The columns don't add up to the total due to the fact, that the data was weight according to the zip areas.

Table 10: Essential/important environmental features for renting a house/unit

	total	North (zip code 2)	South (zip code 7,8,9)	West (zip code 4,5,6)	East (zip code 0,1)	Middle (zip code 3)
south aspect	299	29	88	77	55	17
	40%	38%	43%	35%	48%	36%
modern thermal insulation glazing	487	45	129	162	70	30
	65%	59%	63%	74%	60%	62%
facades insulation / heat insulation	405	37	108	122	72	23
	54%	48%	52%	56%	62%	47%
calorific value boiler (use of the waste gas heat)	264	27	70	83	37	16
	35%	35%	34%	38%	32%	34%
geothermal heating	123	7	36	39	16	9
	16%	9%	18%	18%	14%	19%
solar thermal energy	144	10	40	44	21	10
	19%	14%	19%	20%	18%	21%
no answer	3%					
	23					

When it comes to renting a house/unit (table 10) modern thermal insulation glazing and insulation of facades were important environmental features for tenants.

Chart 1: Importance of the Energy Performance Certificate for landlords/vendors and for buyers/tenants (Kippes/Eves, 2009),



In a survey by the authors (Kippes/Eves, 2009), which took place in 2009 real estate agents were asked (chart 1) whether “vendors and landlords attach importance to the Energy Performance Certificate - how often do they ask for the Energy Performance Certificate?” 11.7 % of the respondents answered “no, usually not”, another 28.2 % had been asked only in less than 5 % of the cases, and 18.1 % had been questioned in 5 – 25 % of cases.

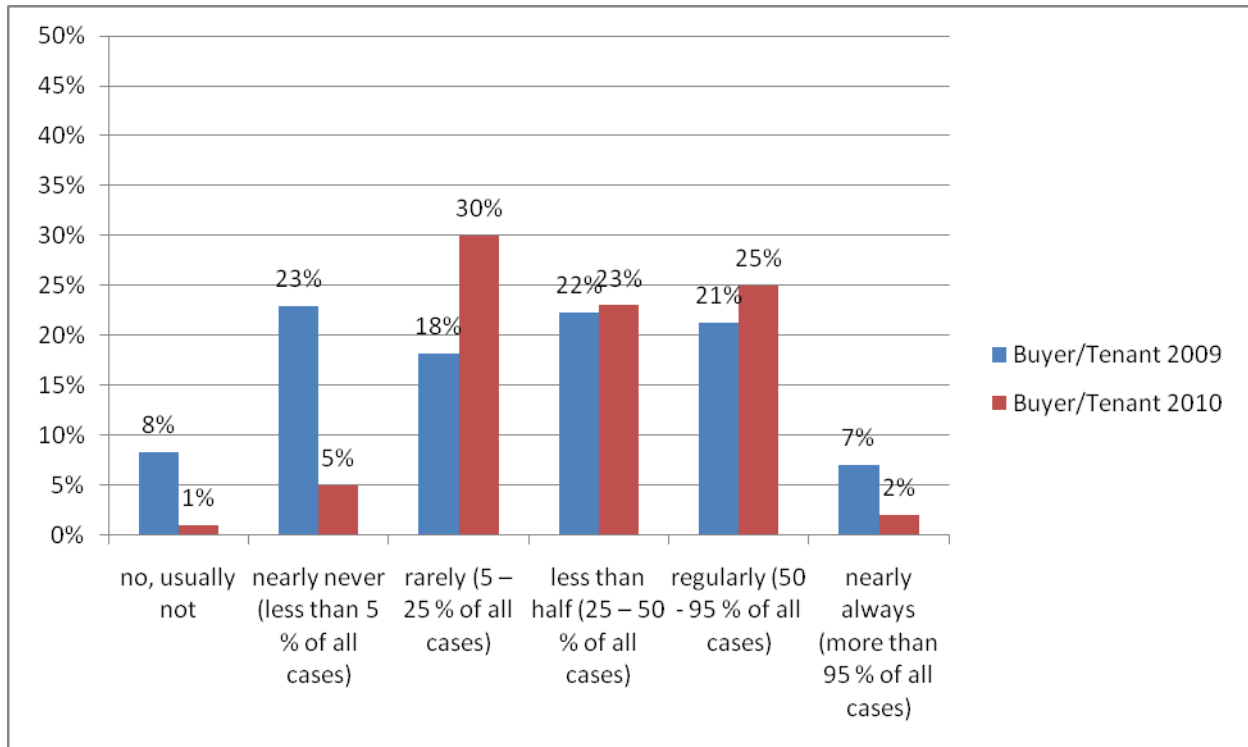
19.3 % of the respondents had been questioned in 25 – 50 % of the cases. In contrast to this in only 18.5 % of the cases vendors inquired periodic (50 - 95 % of the cases) concerning the energy certificate for buildings. Only 4.1 % of the real estate agents had been asked almost at all times (more than 95 % of cases) about this important document. This emphasizes that the energy certificate for buildings was of low importance for landlords and vendors.

Compared to the attitude of landlords and vendors there the survey of 2009 yielded a higher interest in an Energy Performance Certificate than in the case of landlords and vendors. Asked “Which role does the Energy Performance Certificate play for the Buyer/Tenant - how often are you asked by prospective customers for the Energy Performance Certificate?” 8.3 % of the respondents answered “No, usually not”, 22.9 % rated such questions as next to unusual (less than 5 % of cases), and 18.2 % unusual (5 – 25 % of cases).

Another 22.3 % had been asked concerning the Energy Performance Certificate in less than half (25 – 50 % of cases). In contrast to this 21.3 % had been questioned periodic (50 - 95 % of cases), and only 7.0 % had been asked in more than 95 % of the cases.

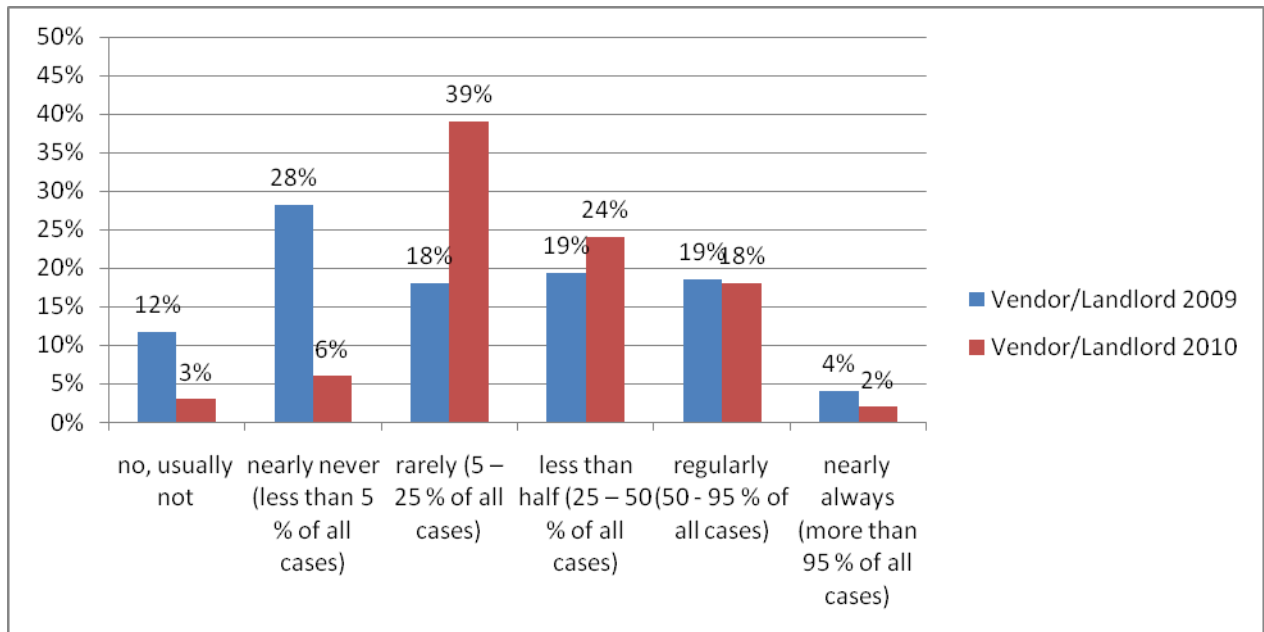
These results again confirm the fact that buyers are not as aware or concerned about environmental issues as would be expected given the significant efforts both governments and interest groups have taken in these areas.

Chart 2: Importance of the Energy Performance Certificate for buyers/tenants 2009 vs. 2010



Compared to the survey of 2009 that of 2010 (chart 2) showed a slowly growing importance of the Energy Performance Certificate for buyers/tenants. Especially the number of real estate agents who reported that buyers/tenants usually didn't inquire about this certificate went down from 8% in 2009 to only 1% in 2010. At the same time the value for buyers/tenants who asked for this information in less than 5% of the cases dropped from 23% to 5% in the same period.

Chart 3: Importance of the Energy Performance Certificate for landlords/vendors 2009 vs. 2010



The perspective of landlords/vendors (chart 3) concerning the importance of the Energy Performance Certificate yielded a similar picture. The number of real estate agents who were not or nearly not asked concerning this certificate sank from 12% in 2009 to 3% in 2010. In 2009 28% of the agents stated that they had been asked about this environmental information in less than 5% of the cases; in 2010 this value was down to a mere 6%.

Like in 2009, in 2010 landlords/vendors were less interested in the Energy Performance Certificate than buyers/tenants. The underlying reason for this is that landlords/vendors tend to see this certificate more as burden in the selling-/letting process or useless paperwork, than buyers/tenants who have to live with energetic shortcomings of a building for a long time and who have to foot the bill for these in future years.

Table 11: The percentage of landlords/vendors and tenants/buyers asking for the Energy Performance Certificate

	landlords/vendors	tenants/buyers
0%	20	10
	3%	1%
1-10%	198	141
	26%	19%
11-20%	96	94
	13%	12%
21-30%	89	66
	12%	9%
31-40%	46	50
	6%	7%
41-50%	83	85
	11%	11%
51-60%	33	35
	4%	5%
61-70%	34	50
	5%	7%
71-80%	31	57
	4%	8%
81-90%	30	33
	4%	4%
91-100%	22	28
	3%	4%
no answer	71	103
	9%	14%

Similar to the survey of 2009, the Energy Performance Certificate is, despite the fact that it is gaining some importance, still not high on the agenda (table 11) of landlords/vendors and tenants/buyers as well.

Table 12: The percentage of landlords/vendors and tenants/buyers asking for the Energy Performance Certificate by region

	Total	North (zip code 2)	South (zip code 7,8,9)	West (zip code 4,5,6)	East (zip code 0,1)	Middle (zip code 3)
Total	752 ⁶	76	206	218	116	48
0%	10	0	2	2	4	0
	1%	0%	1%	1%	4%	0%
1-10%	141	15	36	41	31	10
	19%	20%	17%	19%	27%	21%
11-20%	94	12	32	27	10	4
	12%	15%	16%	13%	9%	8%
21-30%	66	10	19	19	10	5
	9%	14%	9%	9%	9%	11%
31-40%	50	7	15	13	9	3
	7%	9%	7%	6%	8%	6%
41-50%	85	8	21	33	13	6
	11%	11%	10%	15%	11%	13%
51-60%	35	8	11	10	4	1
	5%	11%	5%	5%	4%	2%
61-70%	50	5	14	12	8	8
	7%	6%	7%	6%	7%	17%
71-80%	57	5	21	20	9	2
	8%	6%	10%	9%	8%	4%
81-90%	33	3	14	9	1	4
	4%	5%	7%	4%	1%	8%
91-100%	28	3	6	10	3	2
	4%	5%	3%	4%	3%	4%
no answer	103	0	14	23	13	4
	14%	0%	7%	10%	11%	8%

The percentage of landlords/vendors and tenants/buyers asking for the Energy Performance Certificate by region show that the east of Germany is lagging behind, with 4% of the agents who hadn't be asked about this certificate and 27% who had only been asked in 10% of the cases.

⁶ The columns don't add up to the total due to the fact, that the data was weight according to the zip areas.

Table 13: Energy Efficiency Certificate advertised in brochures

0%		28
	4%	
1-10%		130
	17%	
11-20%		58
	8%	
21-30%		71
	9%	
31-40%		34
	5%	
41-50%		70
	9%	
51-60%		15
	2%	
61-70%		27
	4%	
71-80%		43
	6%	
81-90%		33
	4%	
91-100%		80
	11%	
no answer		164
	22%	

There is still not enough marketing done using the Energy Efficiency Certificate (table 13). This certificate is an important information tool - especially for tenants/buyers. The fact that this certificate is not included in all brochures may be due to the fact that still a high proportion of tenants/buyers aren't interested in the Energy Efficiency Certificate, or that the property has a bad environmental track record.

Table 14: Energy Efficiency Certificate advertised in brochures - by region

	total	North (zip code 2)	South (zip code 7,8,9)	West (zip code 4,5,6)	East (zip code 0,1)	Middle (zip code 3)
Total	752	76	206	218	116	48
0%	28	3	5	9	8	2
	4%	5%	2%	4%	7%	4%
1-10%	130	16	36	45	15	9
	17%	21%	17%	20%	13%	19%
11-20%	58	9	17	15	10	5
	8%	12%	8%	7%	9%	9%
21-30%	71	8	16	20	17	5
	9%	11%	8%	9%	14%	11%
31-40%	34	3	11	8	6	4
	5%	5%	5%	4%	5%	8%
41-50%	70	14	21	16	11	4
	9%	18%	10%	7%	9%	8%
51-60%	15	2	5	2	2	1
	2%	3%	3%	1%	2%	2%
61-70%	27	0	11	8	3	4
	4%	0%	5%	4%	3%	8%
71-80%	43	2	10	15	10	4
	6%	3%	5%	7%	9%	8%
81-90%	33	2	12	10	4	2
	4%	3%	6%	5%	4%	4%
91-100%	80	7	29	26	10	5
	11%	9%	14%	12%	9%	9%
no answer	164	8	33	45	20	5
	22%	11%	16%	20%	17%	11%

Table 15: Features and their importance for the selection of a property

	rank 1	rank 2	rank 3	rank 4	rank 5	rank 6	average rank
infrastructure (e.g. transport connection)	80	155	171	94	57	40	3,02
	11%	21%	23%	13%	8%	5%	
location	443	148	41	10	8	2	1.46
	59%	20%	5%	1%	1%	0%	
age of the property	7	39	114	119	94	81	4.10
	1%	5%	15%	16%	13%	11%	
price	140	237	142	87	26	16	2.49
	19%	31%	19%	12%	3%	2%	
structural design of the building	6	29	40	106	146	164	4.73
	1%	4%	5%	14%	19%	22%	
environment-friendliness / energy efficiency	7	44	83	145	169	144	4.45
	1%	6%	11%	19%	23%	19%	
size of the housing estate	17	53	92	102	136	180	4.43
	2%	7%	12%	14%	18%	24%	
no answer	39						
	5%						

When it comes to buying or renting a house or a flat certain features and their importance for the selection of a property were analyzed (table 15). In 59% of the cases real estate agents stated that the location was ranked first. The price came second but was ranked much lower (19%), followed by the infrastructure (e.g. transport connection). With only 1% for environment-friendliness/energy efficiency, lagging behind, which demonstrates the comparatively low importance of eco-friendliness for buyers and renters compared to other features of a property.

The average rank of location was 1.46 followed by the price with 2.49; environment-friendliness/energy efficiency scored only 4.45.

Table 16: Features and their importance for the selection of a property by region

	total	North (zip code 2)	South (zip code 7,8,9)	West (zip code 4,5,6)	East (zip code 0,1)	Middle (zip code 3)	average rank
infrastructure (e.g. transport connec- tion)	80 ⁷	7	17	25	16	5	3,02
	11%	9%	8%	11%	13%	11%	
location	443	48	134	127	78	26	1.46
	59%	64%	65%	58%	67%	55%	
age of the property	7	1	1	4	0	0	4.10
	1%	2%	1%	2%	0%	0%	
price	140	16	42	46	17	13	2.49
	19%	21%	20%	21%	14%	26%	
structural design of the building	6	0	1	4	1	0	4.73
	1%	0%	0%	2%	1%	0%	
environment-friend- liness / energy effi- ciency	7	0	1	3	2	0	4.45
	1%	0%	1%	2%	2%	0%	
size of the housing estate	17	2	5	6	0	2	4.43
	2%	3%	3%	3%	0%	4%	
no answer	39	0	1	1	1	0	
	5%	0%	0%	0%	1%	0%	

A breakdown of the data by region shows that the location is still ranking first in all regions with a value of at least 55% for the first rank. The price is second after the location of the property; the value of the first rank differs between 14% in the east and 26% in middle, while environment-friendliness/energy efficiency scored in no region as first ranked in more than 2% of the cases. Only in the regions west and east it reached the first rank in 2%.

5. Conclusion

The survey shows some very interesting aspects of the importance of attributes in the purchase decision of buyers concerning residential properties.

Of most importance is the fact that in Germany environmental/energy efficiency factors are still not the most important factor that buyers consider when purchasing a house, despite the voluntary and mandatory measures that Governments have introduced and the growing awareness of these issues in the media.

⁷ The columns don't add up to the total due to the fact, that the data was weight according to the zip areas.

A regional breakdown of the data shows that the east of Germany is lagging behind the rest of Germany when it comes to green building issues.

Compared to the survey of 2009 by the authors, that of 2010 showed a slowly growing importance of the Energy Performance Certificate for buyers/tenants. Especially the number of real estate agents who reported that buyers/tenants usually didn't inquire about this certificate went down from 8% in 2009 to only 1% in 2010. The perspective of landlords/vendors (chart 3) concerning the importance of the Energy Performance Certificate yielded a similar picture.

Like in 2009, in 2010 landlords/vendors were less interested in the Energy Performance Certificate than buyers/tenants. The underlying reason for this is that landlords/vendors tend to see this certificate more as burden in the selling-/letting process or useless paperwork, than buyers/tenants who have to live with energetic shortcomings of a building for a long time and who have to foot the bill for these in future years.

At this point in the 'green housing' and "housing energy efficiency" development in residential property, for the majority of house buyers the importance of environmental factors appears to be an issue once the property is purchased rather than a consideration in the purchase decision.

These results also confirm that adoption of energy efficient measures in existing housing stock on a voluntary basis will not necessarily be effective due to buyer priorities, thus a more regulated scheme may be required to achieve energy efficiency goals in residential housing sectors.

In several of these topics the respondents rated environmental questions as important, but when it comes to hard choices between different features of a property, environmental features are lagging behind, while other issues (e.g. the location) are far more important. This indicates that eco-friendliness is compared to these features often only considered as nice to have but not essential.

Concerning selling and renting a property, when it comes to renting a property the impact of a good energetic status on the price is substantial weaker.

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