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European Rental Housing Framework for the Profitability Calculation of Energetic Ret rofitting Investments

H2020-EE-2014-2015: H2020-EE-2014-3-MarketUptake

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Fact sheets regarding “green-premiums” for energy efficiency

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I. Project synopsis

Objectives of the project

The EU directive 2010/31 on the energy performance of buildings (recast) of 19th May 2010 (EPBD recast)1 sets out requirements regarding the energy performance of new buildings, as well as minimum requirements for the energy performance of existing buildings, building units and building elements that are subject to major renovation (Art. I No. 2 (c)). These minimum requirements shall not prevent any member state from maintaining or introducing stronger measures. As a minimum requirement, a “cost optimal level” shall be reached (Art. 14, Art. 2 No.14). The EPBD recast directive establishes the calculation for the “cost-optimal level” of minimum energy performance requirements including a comparative methodology framework, distinguishing between new and existing buildings and between different categories of buildings. Unlocking the barriers to proven economic saving potentials offered by energy efficiency investments in the existing building stock are considered crucial for meeting European energy efficiency targets. This is especially important for rental housing, which represents the majority of the multifamily housing stock in most participating countries.

Although the calculation methodology established within the EPBD framework suggests that in general, retrofitting investments are financially viable within given cost conditions, there is no sufficient energy investment.

One reason is the limitation of the methodology framework to the financial perspective of the owner-occupier, thus neglecting other relevant stakeholder groups such as the rental housing sector.

A set of market failure mechanisms summarised under “split incentives’ barriers” are obstacles for investment in the rental housing sector. Split incentives may not only arise from the factual separation of investor and beneficiary (landlord-tenant disincentive), but also from asymmetrical risk exposition during the refinancing period (temporal disincentives) or from free rider problems (landlord-landlord dilemma) within owners’ associations.

[1] http://www.eceee.org/policy-areas/buildings/EPBD_Recast/EPBD_recast_19May2010.pdf

Article 19 of the EU directive 2012/27 on energy efficiency of 25th October 2012 states, that "Member States shall evaluate and if necessary take appropriate measures to remove regulatory and non-regulatory barriers to energy efficiency, without prejudice to the basic principles of the property and tenancy law of the Member States, in particular as regards the split of incentives between the owner and the tenant of a building (…)" with a view to ensuring that these parties are not deterred from making efficiency-improving investments that they would otherwise have made by the fact that they will not individually obtain the full benefits or by the absence of rules for dividing the costs and benefits between them (…)".[2]

Therefore, the essential challenge for improving the attractiveness of investments within the rental housing industry will be the removal or mitigation of investment barriers. To date there is no standardised methodology for calculating the profitability of refurbishment investments, not even within the property valuation standards of individual countries.

Objective I: profitability assessment in the rental housing sector

RentalCal's first objective is to develop a comparable methodology for the profitability assessment of energy efficient retrofitting investments in the rental housing sector. This methodology needs to incorporate given national cost levels (investments and operational costs) and efficiency improvements on the one side. On the other side it needs to consider returns (rental and appreciation returns of "green value") as well as technical, legal and financial framework conditions (construction costs, capital costs, taxation e.g. depreciation allowances, legal status of contract rents etc.).

Objective II: Improving the transparency of investment conditions

Due to a lack of supranational competencies in the housing sector, there is a lack of systematic and comparable assessment of the level of current investment barriers in EU countries and their impact on the renovation rate in the rental housing stock. Moreover, satisfactory information is not even available on the level of a mere qualitative assessment of specific issues like the handling of landlord-tenant-disincentives within national rental statutes.

[2] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:315:0001:0056:en:PDF

Therefore, the second objective of RentalCal is to provide comparable and transparent information on the profitability of energy efficiency investments that can be used both for the assessment of investment decisions, and for the comparative analysis of existing barriers in the private rental housing stock of participating countries. Within this objective, the technical, legal, financial and institutional framework conditions for energy saving investments in the rental housing sector of selected European member states will be analysed. Furthermore, the project emphasises the cross-national comparative analysis of the profitability calculation of energy retrofitting investments. In this context, RentalCal aims to contribute to a harmonisation of the methodologies and calculation standards in the field of profitability assessments for energy retrofitting investments in the existing housing stock.

Objective III: disseminate knowledge on green value issues in the rental housing industry

RentalCal specifically aims to prepare the ground for investment in the existing rental housing stock. In this sense, the development of a theoretical framework can ultimately help change the behaviour of property investors and ought to have great impact for climate change adaptation in the real estate industry. The immediate beneficiaries of our output are landlords and property investors who will be better informed regarding the feasibility of a proposed investment. With this approach RentalCal is significantly targeting the business case for energy efficiency retrofitting which is extremely important. In doing so, the proposed project provides insights into the pricing of energy efficient buildings that stakeholders can use to assess the enhancement of asset values and understand the market mechanisms. This will ultimately strengthen the financing and attractiveness of sustainable energy investments.

The RentalCal Consortium

RentalCal is an international research project funded by the European Union under the H2020 framework that links together eleven partner organisations - universities, public research institutes, and practitioners in the field of real estate economics, housing policy and energy efficiency.

The RentalCal consortium partners represent housing markets from eight EU member states (Czech Republic, Denmark, France, Germany, Great Britain, Poland, Spain and the Netherlands), each with a distinct regulatory and socioeconomic framework for housing provision. RentalCal's consortium members cover a majority share of EUs largest rental housing markets with a total of about 33 million dwellings in the private rental sector, with about 46 % of it built in 1980 or earlier.

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II. The scope of WP 5 in the general project context

The core objective of WP5 is to compile, interpret and discuss the empirical evidence on the market pricing of energy-efficient features and buildings (market framework conditions). In addition to carrying out econometric analyses in selected European markets, this work package conducts a comparison of the relevant national, regional and local trends in the take-up of energy-efficient buildings and the potential constraints for pricing energy-efficient building features. Based on this information, policy recommendations for the removal of existing market barriers are derived in conjunction with the results of WP3 (legal framework) and made ready for communication and dissemination activities related to policy makers in WP9.

This work package has also the objective of analysing and outlining existing subsidies and financing mechanisms for investments in energy efficiency in the private rented sector of the participating countries (financial framework conditions). Particularly, the focus is on compiling information on availability of green mortgages and other debt financing instruments with favourable rates and conditions.

Work package 5 results are presented in the following deliverables:

- D5.1: Report with 8 country specific sections, containing a description of packages of measures and best practice approaches for reducing/removing market barriers for increased willingness to pay.
- D5.2: Report with 8 country specific sections, containing a description of “green-premiums”, i.e. energy efficiency related value drivers (rental premiums, sales price premiums, higher occupancy rates) and operating costs.
- D5.3: Report with 8 country specific sections, containing a description of grants and other subsidies for each partner country.
- D5.4: Report with 8 country specific sections, containing a description of financing conditions (Interest rate, durations, conditions) for each partner country.
- D5.5: Report featuring the results of four country specific empirical studies (hedonic pricing models of green premiums)

III. Interrelation with other work packages

The setting of WP 5 within the project is presented in **Fehler! Verweisquelle konnte nicht gefunden werden.**. Both market and financial framework conditions analysed in WP5 are used to generate input parameters for the profitability calculations in WP6. All information collected will be analysed and aggregated in the form of comprehensive country specific fact sheets (brief descriptive summary and basic statistics/analysis of collected data).

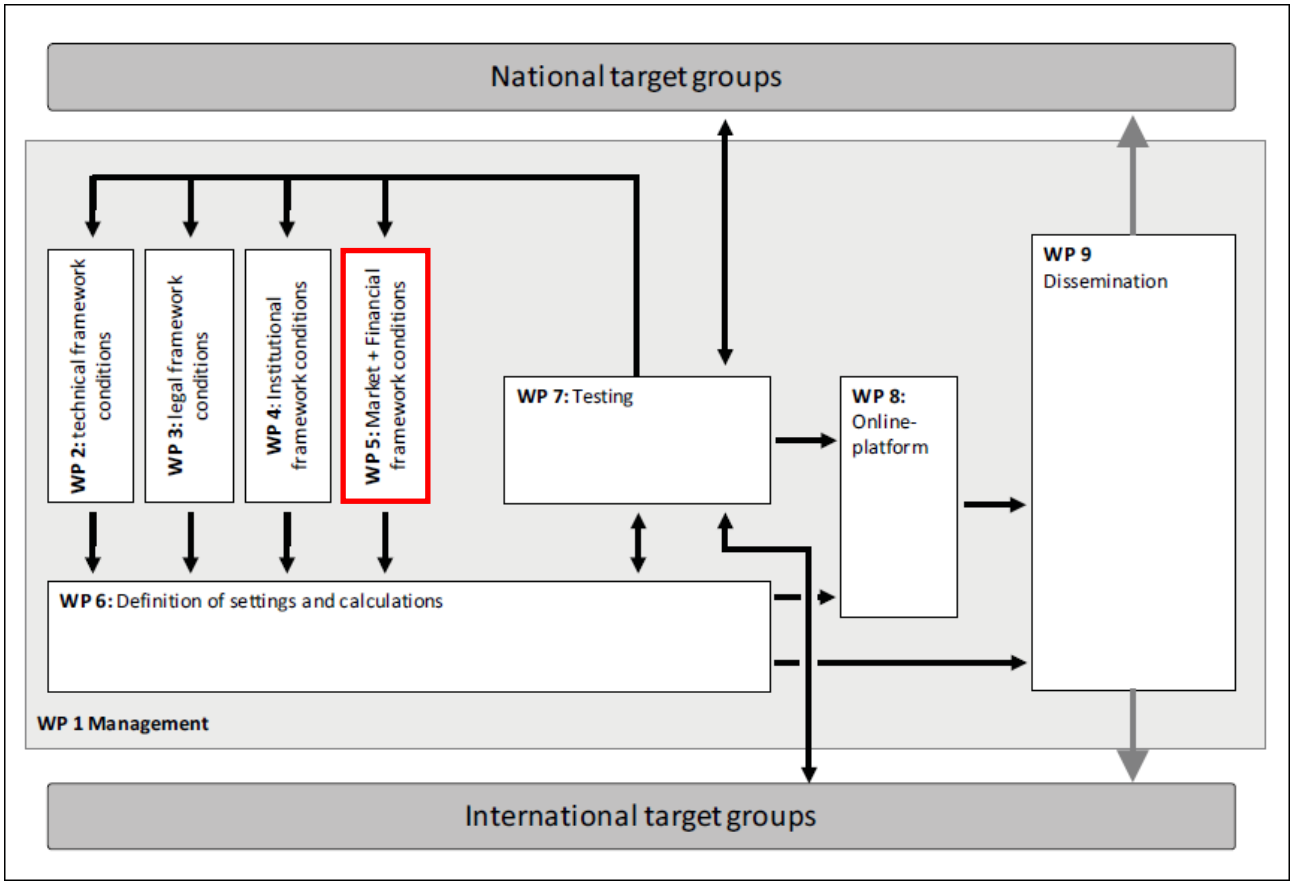

Figure 1: Work package flow chart

1 Overview on research efforts of deliverable 5.2

1.1 Current state of research

A large fraction of the future building stock in the European Union already exists today, and new construction typically only comprises 1-2% of the existing stock. Hence, energy efficiency retrofits play a key role in delivering European Union and national policy objectives of climate change mitigation. However, achieving these policy goals hinges not so much on the availability of suitable products and technologies but on a clear analysis of the upfront cost of green investment and the extent the market enables the investors to recoup this via future income streams. In most EU countries, a prominent segment of the built environment is contained in the private rented sector. This sector, which often houses low-income families and the young urbanised population in cities, offers a flexible form of tenure and contributes to increased labour mobility in the economy (Böheim, 1999). Yet, levels of energy efficiency in private rented properties are significantly below standards (Howden-Chapman, 2004). In many rental arrangements there are missing incentives for landlords to make the upfront capital investments in energy efficiency when the most obvious benefits in the form of lower utility bills are reaped by the tenants. However, less predictable monetary returns such as higher rent premiums, reduced risks of rent arrears, and lower vacancy risks, flow to the landlord, making payback periods uncertain and subject to rent fluctuations. Despite this, the prospective risk-adjusted returns embedded in these stochastic investments into building efficiency are likely to serve as a core metric for investors to navigate through the complex decision-making process. One factor affecting the decision to invest in building efficiency are the mandates and incentives provided by existing and future regulatory measures such as the Energy Performance Certificate (EPC). By setting this benchmark of the building rating system, the market mechanism in the real estate market is used to take action against further build-up of the atmospheric carbon dioxide concentration that drives climate change (Yudelson, 2010).

1.2 Central questions to be answered in D 5.2

This deliverable compiles and compares market information on demographics, residential property market fundamentals, average operating costs and multiple benefits of energy

efficiency investments including green sales and rental premium in the private rental sector of countries in the RentalCal consortium. In so doing, insights into financial information, market conditions and trends relevant for assessing profitability of green retrofit investments in the private rented sector are provided.

1.3 **Procedure**

- Chapter 1 contains an overview on the project and a description of the work flow
- Chapter 2 contains the summarising results and cross country comparison fact sheets.
- Chapter 3 contains the individual country report sections

2 Results: Green premiums and value drivers in a comparative perspective

2.1 Demand structure in the market based rental housing sector

In many European countries there is an increasing interest in developing a more sustainable private rented sector. Particularly, as in recent years, increased migration and labour mobility across EU and within member states have reversed the post-war trend of increased owner-occupation and social housing. The below factsheet, based on Eurostat 2014 data, shows distribution of household composition in the private rented sector of the countries in the RentalCal consortium. The most common households' type in these countries is households with dependent children. The second most common household type are single person households in Denmark, France, Germany and Netherlands, multi-person/family households in Poland and Spain and working age couples in Czech Republic and UK.

Report	D 5.2: Factsheets on Green Premiums and Value drivers of Energy Efficiency
Section of report	Country section 1: Demand structure in the market based rental housing sector
Factsheet 2.1.1	Household types in the private rental market

Table 1: Cross country comparison of household types in the private rental market

Variable	Households with dependent children	Single households	Working age couples	Senior couples	Multi-person households
Czech Republic	50.3	11.6	13.5	11.6	13.0
Denmark	47.4	22.7	15.4	12.1	2.4
France	52.5	16.0	14.4	12.4	4.7
Germany	42.2	20.2	16.6	14.4	6.6
Netherlands	50.3	16.8	15.0	12.5	5.4
Poland	56.0	8.7	10.5	7.4	17.4
Spain	50.9	9.8	11.6	11.0	16.7
United Kingdom	48.4	12.5	15.8	12.3	10.9
Data source and reference year	SILC ilc_lvho02, 2014	SILC ilc_lvho02, 2014	SILC ilc_lvho02, 2014	SILC ilc_lvho02, 2014	SILC ilc_lvho02, 2014

In the next factsheet, considering the housing tenure in 2014 for the same countries, an interesting pattern emerges. A first set is formed by Poland and Spain, in which a low percentage of households live in private rental housing (facing the market rent), 4% and 12% of the housing stock, respectively. A second group includes France, Czech Republic and UK, where 19% of the housing stock in France is private rented, and 17% in the Czech Republic and 17% in the UK, respectively. The third set is countries with traditionally large private rented sector such as Germany (40%), Denmark (37%) and Netherlands (33%). It is also worth noting that whilst the UK might have a smaller share of households in the private rented sector by comparison, the UK private rented sector has been growing in recent years due to unaffordability of owner-occupation. In contrast, there has been some recent evidence of the private rental sector contracting in certain cities in Germany (Paragon-group report 2015). In terms of the burden of renting, a large proportion of Spanish households were found to spend a high share of their disposable income on paying rent in 2014, followed by UK and Denmark with a 33% of households spending 40% of their disposable income on rent. France had the lowest proportion of households (16%) spending a high proportion of their income on rent.

Turning to average duration of residence in the private rented sector. UK households have traditionally had short-term tenure duration, while households in Germany and Spain tend to have long-term average tenure duration. Particularly, the short-term duration in the UK is linked to socio-economic characteristics of the households in the private rented sector and the lack of long-term tenancy agreements.

Report	D 5.2: Factsheets on Green Premiums and Value drivers of Energy Efficiency
Section of report	Cross country comparison
Factsheet 2.1.2	Housing demand in the private rental sector

Table 2: Cross country comparison of housing demand in the private rental sector

Variable	Share of owner occupier households	Share of households living in reduced price or free rental housing	Share of households living in market price rental housing	Major demand group in market based rental housing	Share of households in market based rental housing: housing overburden rates	Average duration of residence in a rental property
Czech Republic	78.9	4.5	16.6	households with dependent children, working age couples	29.9	medium (5 to 10 years)
Denmark	63.3	0.1	36.6	households with dependent children, single households	32.9	medium (5 to 10 years)
France	65.0	15.7	19.3	households with dependent children, single households	15.8	medium (5 to 10 years)
Germany	52.5	8.0	39.6	households with dependent children, single households	23.1	long (more than 10 years)
Netherlands	67.0	0.4	32.6	households with dependent children, single households	24.8	medium (5 to 10 years)
Poland	83.5	12.3	4.3	households with dependent children, multi person households	25.5	medium (5 to 10 years)
Spain	78.8	9.0	12.1	households with dependent children, working age couples	47.5	long (more than 10 years)
United Kingdom	64.8	18.1	17.1	households with dependent children, working age couples	33.2	short term (2 to 5 years)
Data source and reference year	SILC ilc_lvho02, 2014	SILC ilc_lvho02, 2014	SILC ilc_lvho02, 2014	SILC ilc_lvho02, 2014	SILC ilc_lvho02, 2014	Thinking aloud Aberdeen-asset, 2016

2.2 Rents and operating cost issues in the market based rental housing sector

Europe's property market has been insipid since the financial Crisis of 2008. In the past few years, some European economies have emerged from the crisis; others are still struggling to achieve desired levels of economic activities (PWC, 2015). Consequently, the countries in the RentalCal consortium have experienced different growth rates. As shown in the below factsheet, Germany and the UK appeared to have emerged from the dip and have on average experienced a high growth in property prices over the past 5 years. This may suggest that domestic investors and Pan-European investors may have opted to invest in these large and stable markets due to their depth and liquidity. This is in stark contrast to Czech Republic, Poland and Spain in which price growth has been very low or negative in the past few years. Over the same period, France and Denmark, on average, experienced low or moderate growth in house prices. Considering rental price dynamics, across Europe rental growth remains elusive. While on average, Denmark, Germany and the Netherlands have experienced medium or high rental price growth, other countries in the consortium have experience negative or low rental growth. Furthermore, gross rental returns (or rental yields) figures for 2016 published by the cost–of-living firm Numbeo, reveal that the cycles of recovery across Europe can bring longer term high yield rental investments. Particularly, the rental returns are relatively high in the Netherlands. Yields are also high in Poland, Denmark, Spain and the UK, but relatively moderate in France and Germany. These figures suggest that green investments are likely to be embedded in these long-term investments (PWC, 2015).

Turning to operating costs and affordability, as shown in below factsheet, France and Spain have experienced high growth in electricity prices, UK medium growth and all the other countries in the RentalCal consortium have experienced low or negative growth of electricity prices. Whereas, the growth rate of gas prices has been negative or low in all countries over the past 5 years, except Spain and the UK. These figures are not surprising as oil prices have fallen in recent years.

Lastly, differences in energy prices and rental price levels across the RentalCal Consortium are likely to explain that households in different countries spend different share of their income on heating costs. The proportion of households in Fuel Poverty also differs across

the partner countries, with Denmark and Netherlands having the lowest share of households in Fuel Poverty, while Poland and the UK have the highest. With national definitions of fuel poverty varying a lot, or are not existent, though, these findings are not comparable in a quantitative way.

Report	D 5.2: Factsheets on Green Premiums and Value drivers of Energy Efficiency
Section of report	Cross country comparison
Factsheet 2.2.1	General national market conditions

Table 3: Cross country comparison of general national market conditions

Variable	5 year rent dynamics	5 year sales price dynamics	Rental Yield City Centre	Rental Yield Outside of Centre	Price To Rent Ratio City Centre	Price To Rent Ratio Outside Of City Centre
Czech Republic	*negative/low growth (<2% real p.a.)*	*negative/low growth (<2% real p.a.)*	4.21	4.7	23.77	21.27
Denmark	high growth (>5% p.a.)	medium growth (2% to 5% p.	4.74	5.3	21.08	18.87
France	negative/low growth (<2% real p.a.)	*negative/low growth (<2% real p.a.)*	2.64	3.19	37.89	31.36
Germany	medium growth (2% to 5% p.	high growth (>5% p.a.)	3.82	4.07	26.18	24.54
Netherlands	*medium growth (2% to 5% p.a.)*	*negative/low growth (<2% real p.a.)*	6.26	6.64	15.98	15.07
Poland	*negative/low growth (<2% real p.a.)*	*negative/low growth (<2% real p.a.)*	4.43	4.99	22.59	20.02
Spain	*negative/low growth (<2% real p.a.)*	*negative/low growth (<2% real p.a.)*	4.49	5.12	22.27	19.52
United Kingdom	negative/low growth (<2% real p.a.)	high growth (>5% p.a.)	4.42	4.53	22.63	22.06
Data source and reference year	Global property guide, 2015	Global property guide, 2015	Numbeo, 2015	Numbeo, 2015	Numbeo, 2015	Numbeo, 2015

Report	D 5.2: Factsheets on Green Premiums and Value drivers of Energy Efficiency
Section of report	Cross country comparison
Factsheet 2.2.2	Energy cost conditions

Table 4: Cross country comparison of energy cost conditions

Variable	Current price per unit heat energy consumed	Recent base cost increases	Recent unit price increases	Data source and reference year
Czech Republic **Electricity** **Oil** **Gas**	€ 0.142 € 0.095 € 0.060	 Negative/low growth (<2% real p.a.) N/A Negative/low growth (<2% real p.a.)	 Negative/low growth (<2% real p.a.) N/A Negative/low growth (<2% real p.a.)	EUROSTAT 2014, ENERGOSTAT 2014; TZB-info 2015, European commission, 2015
Denmark **Electricity** **Oil** **Gas**	 € 0.297 € 0.160 € 0.109	 *Negative/low growth (<2% real p.a.)* N/A Negative/low growth (<2% real p.a.)	 *Negative/low growth (<2% real p.a.)* *Negative/low growth (<2% real p.a.)* Negative/low growth (<2% real p.a.)	ENS (Danish Energy Agency), 2016
France **Electricity** **Oil** **Gas**	 € 0.164 € 0.078 € 0.049	 - - -	 High growth (>5% p.a.) Negative/low growth (<2% real p.a.) Negative/low growth (<2% real p.a.)	Projet-gaz.grdf, 2015
Germany **Electricity** **Oil** **Gas**	 € 0.220 € 0.059 € 0.065	 Negative/low growth (<2% real p.a.) N/A Negative/low growth (<2% real p.a.)	 Negative/low growth (<2% real p.a.) Negative/low growth (<2% real p.a.) Negative/low growth (<2% real p.a.)	 BDEW , 2016 Thermondo, 2016
Netherlands **Electricity** **Oil** **Gas**	 € 0.187 € 0.120	 *Negative/low growth (<2% real p.a.)* N/A Negative/low growth (<2% real p.a.)	 *Negative/low growth (<2% real p.a.)* Negative/low growth (<2% real p.a.)	 CBS, 2016 Amsterdam tips, 2015
Poland **Electricity** **Oil** **Gas**	€ 0.117 € 0.051 € 0.049	Negative/low growth (<2% real p.a.) N/A Negative/low growth (<2% real p.a.)	Negative/low growth (<2% real p.a.) N/A Negative/low growth (<2% real p.a.)	European climate,2015
Spain **Electricity** **Oil** **Gas**	 € 0.242 € 0.079 € 0.064	 High growth (>5% p.a.) N/A High growth (>5% p.a.)	 High growth (>5% p.a.) Negative/low growth (<2% real p.a.) High growth (>5% p.a.)	Eurostat, 2016, Gas Natural Feno-sa, 2016
United Kingdom **Electricity** **Oil** **Gas**	 € 0.173 € 0.045 € 0.052	 Medium growth (2% to 5% p.a.) N/A Medium growth (2% to 5% p.a.)	 Medium growth (2% to 5% p.a.) Medium growth (2% to 5% p.a.) Medium growth (2% to 5% p.a.)	Energy Saving Trust and Office for National Statistics, 2016. P Bolton, 2016.

Report	D 5.2: Factsheets on Green Premiums and Value drivers of Energy Efficiency
Section of report	Cross country comparison
Factsheet 2.2.3	Operating costs practices: heat energy
Question(s)	Energy Cost Bearing Practice, Average Monthly Energy Cost, Share of Energy Costs in Rent and Fuel Poverty

Table 5: Cross country comparison of operating costs practices: heat energy

Variable	Energy costs bearing practice	Metering	Involved contract parties	Average monthly energy cost- 85 m2 apartment	Share of heat energy costs in total rent	National definition of households in fuel poverty	Share of households under national fuel poverty level
Czech Republic	All costs	Metering	Service provider	146.54	35	No formal definition	6.2
Denmark	All costs	Metering	Service provider	164.07	19	No formal definition	3.9
France	All costs	Metering	Service provider	149.26	21	Fuel poor if facing difficulties in terms of energy supply related to the satisfaction of elementary needs, this being due to the inadequacy of financial resources or housing conditions	6.8
Germany	All costs	Metering	Service provider	215.56	34	No formal definition	5.3
Netherlands	All costs	Metering	Service provider	155.18	17	No formal definition	2.9
Poland	All costs	Metering	Service provider	139.46	38	No formal definition	11.4
Spain	All costs	Metering	Service provider	121.83	22	No formal definition	8.0
United Kingdom	All costs	Metering	Service provider	188.64	19	Old definition: more than 10% share of income spent on fuel New definition: fuel poor if income is below the poverty line and energy costs are higher than is typical for their household type	10.6
Data source and reference year				Numbeo, 2016	Combined sources from Numbeo, 2016	France: Plan Bâtiment Grenelle, 2009 UK: DECC, 2013	Eurostat SILC, 2013

2.3 **“Green” premiums, benefits and risks of energy efficiency refurbishments**

This section reviews the empirical evidence on the economics of energy efficiency retrofits in the context of pricing of buildings with high environmental performance. While there is no complete consensus on the capitalisation of energy efficiency into residential prices and rents, the majority of studies points to a 'green premium'. This premium appears to be more significant in the owner-occupied market segment than in the private rental market. These findings indicate that the retrofitting targets in EU Member States may not be achievable purely based on prevailing market mechanisms but may require support from suitable policy measures. Investment in energy efficiency can provide multiple of benefits to different investors. Whether by directly reducing energy demand and associated costs or facilitating other co-benefits, the enormous potential of energy efficiency is highlighted. In the below Factsheet, it is shown that high sales premiums exist in the majority of the countries in the consortium, except Czech Republic, Poland and Spain in which no studies exist to date. Likewise, in some countries, France, Germany, Netherland and the UK, favourable rental price and vacancy premiums are reported. Other financial benefits of energy efficiency investments common for all countries are energy cost reduction, hedging against energy price volatility and extended building life cycle (IEA, 2016).

In the second factsheet, several ancillary benefits of energy efficiency investments relevant in all countries in the consortium are summarised in relation to investors’ type. For example, for private investors, tax advantage, subsidy exploitation and complying with stringent building standards and regulations are highly regarded. Whereas, for non-for-profits and for landlords in the social housing sector, public image subsidy exploitations and ecological benefits of their investment in energy efficiency are considered to be important.

Report	D 5.2: Factsheets on Green Premiums and Value drivers of Energy Efficiency
Section of report	Cross country comparison
Factsheet 2.3.1	Market relevance of green premium issues

Table 6: Cross country comparison of market relevance of green premium issues

Variable	Rent premium	Value premium	Market advantages	cost reduction	Energy price risk reduction	Building life cycle extension	Data source and reference year
Czech Republic	-	-	-	High	High	High	
Denmark	-	High	-	High	High	High	Jensen et al (2016)
France	High	High	High	High	High	High	Notaires De France, 2013
Germany	High	High	High	High	High	High	Cajias & Piazolo (2013), Cajias, Fuerst & Bienert (2016), GdW (2013), GESOBAU AG (2014)
Netherlands	High	High	High	High	High	High	Brounen (2011), Aydin, Brounen & Hillrichs (2016)
Poland	-	-	-	High	High	High	
Spain	-	-	-	High	High	High	
United Kingdom	Average	High	High	High	High	High	Fuerst et al (2015), Adan & Fuerst (2016)
Data source				Carassus, Immobilierdurable, 2012. Building efficiency initiative, 2012	Carassus, Immobilierdurable, 2012. Building efficiency initiative, 2012	Carassus, Immobilierdurable, 2012. Building efficiency initiative, 2012	

Report	D 5.2: Factsheets on Green Premiums and Value drivers of Energy Efficiency
Section of report	Cross country comparison
Factsheet 2.3.2	Relevance of non-monetary benefits of energy efficiency investments

Table 7: Cross country comparison of the relevance of non-monetary benefits of energy efficiency investments

Variable	CSR/corporate image/ public image	Tax advantages	Subsidy exploitation	Ecological benefits	Social benefits: reduction of fuel poverty risks	Social benefits: thermal comfort improvements and health risk reduction	Legal benefits: compliance with national energy efficiency standards
Private landlords/partnerships	Low	High	High	Low	Low	Low	High
Housing companies / Institutional investors	High	High	High	Low	Low	Low	High
Not-for-profit	High	Low	High	High	High	High	High
Public and Social Landlord	Low	Low	High	High	High	High	High
Data source and reference year	Carassus, Immobilierdurable, 2012. IEEP, 2013	Carassus, Immobilierdurable, 2012. IEEP, 2013	Carassus, Immobilierdurable, 2012. IEEP, 2013	Carassus, Immobilierdurable, 2012. IEEP, 2013	Carassus, Immobilierdurable, 2012. IEEP, 2013	Carassus, Immobilierdurable, 2012. IEEP, 2013	Carassus, Immobilierdurable, 2012. IEEP, 2013

3 Country reports section

3.1 Czech Republic

3.1.1 Rent level and operating costs issues in the market based rental housing sector

The housing market in Czech Republic has moderately grown in recent years as a result of improving economic conditions, low mortgage rates and increasing foreign demand (CZSO, 2015). The relative weakness of the domestic currency has also stimulated foreign property demand. Despite this, the 5 year sales price dynamic is negative for the majority of Czech cities except the capital which has seen a moderate growth in prices. Similarly, rental prices have decreased or been stagnant as Czech households are increasingly buying their own homes due to the recent economic growth. The levels of rent tend to vary significantly between the capital city (Prague) and other major metropolitan areas (Brno, Ostrava). For example, the rent of a small flat in Prague might be twice the rent of a large flat in other big cities. Furthermore, in recent year, rental yields in Czech Republic have been moderate and also varying between major cities. For Instance, low yields in Pardubice (3.47% in 2015) and Prague (3.73% in 2015) and high yields in Budejovice (5.75% in 2015) and Olomouc (5.46% in 2015).

Czech energy prices are fully liberalised but market concentration remains very high with only a handful of suppliers in the marketplace. On average, over the past 5 years, energy prices have been stable and decreasing. Price levels and dynamics of the various energy sources in Czech Republic are summarised in the below factsheet.

In Czech Republic rent has two components: the rent itself and utility costs (heating, domestic how water, etc.). Common costs to cover the maintenance and renovation of the property are typically the responsibility of the landlord, but are usually already included in the rent. The below factsheet summarises the operating costs bearing practices, average monthly operating costs of rental dwellings and the share of these costs in average rental value.

Report	D 5.2: Fact Sheets Regarding "Green-Premiums" for Energy Efficiency
Section of report	Country section 1: Rent level and operating costs issues in the market based rental housing sector
Fact sheet 3.1.1.1	Regional rental market disparities

Table 8: Czech Republic regional rental market disparities

Variable	5 years market rent dynamics	5 years sales price dynamics	Gross Annual Rental Yield City Centre	Vacancy rate	Total Return on Inv. (over 5 years)
National average	negative/low	negative/low	4.28%	17%	6.4%
Prague, capital city	medium growth	medium growth	3.73%	3%	-
Liberec	negative/low	negative/low	4.09%	-	-
Jihlava	negative/low	negative/low	3.77%	-	-
Haradec Karalove	negative/low	negative/low	4.78%	-	-
Karlovy Vary	negative/low	negative/low	4.67%	-	-
Jablonec Nad Nisou	negative/low	negative/low	4.58%	-	-
Kladno	negative/low	negative/low	5.19%	-	-
Plzen	negative/low	negative/low	5.18%	-	-
Pardubice	negative/low	negative/low	5.74%	-	-
Olomouc	negative/low	negative/low	5.46%	-	-
Ceske Budejovice	negative/low	negative/low	3.47%	-	-
Brno	negative/low	negative/low	4.47%	-	-
Data source and reference year	Global property guide, 2015	CZSO, 2015	Prime Asset Investment, 2015	CPI property group,2015	The Moscow Times, 2015

Report	D 5.2: Fact Sheets Regarding "Green-Premiums" for Energy Efficiency
Section of report	Country section 1: Rent level and operating costs issues in the market based rental housing sector
Fact sheet 3.1.1.2	Energy delivery tariff structures and prices

Table 9: Czech Republic energy delivery tariff structures and prices

Variable	Two-part tariff for heat energy delivery?	Average basic rate in heat energy delivery contracts	Current energy unit rate per unit heat energy consumed	Recent basic rate increases	Recent energy unit price increases
household electricity, consumer price	Yes	€ 1207 per year	0.142 € / kWh	negative/low growth	negative/low growth
household "green" electricity (in some countries zero Co2 power is available), consumer price	No	N/A	N/A	-	-
heating gas, consumer price	Yes	€ 510 per year	0.060 € / kWh	negative/low growth	negative/low growth
heating oil, consumer price	Yes	€ 808 per year	0.095 € / kWh	negative/low growth	negative/low growth
renewables (e.g. wood pellets) consumer price	Yes	€ 408 per year	0.048 € / kWh	negative/low growth	negative/low growth
district heating (long-distance)	Yes	€ 612 per year	0.072 € / kWh	negative/low growth	negative/low growth
block heating local)	Yes	€ 765 per year	0.090 € / kWh	negative/low growth	negative/low growth
Data source and reference year		Point estimation based on 30 GJ average annual heat consumption	EUROSTAT 2014, ENERGOSTAT 2014; TZB-info 2015	European Commision, 2015	European Commision, 2015

Report	D 5.2: Fact Sheets Regarding "Green-Premiums" for Energy Efficiency
Section of report	Country section 1: Rent level and operating costs issues in the market based rental housing sector
Fact sheet 3.1.1.3	Operating costs

Table 10: Czech Republic operating costs

Variable	Operating costs bearing	Metering	Involved contract parties	Average regular costs	share of operating costs in total rent
Household electricity	all costs	metering	Service provider	[€ 0.5/m^2 - €0.7/ m^2]	5-10%
Household heat energy	all costs	metering and/or by apartment size	Service provider	[€ 1.0/m^2 – € 1.5/m^2]	10-15%
Water/sewage	Water all costs; sewage none.	Water: metering and/or by apartment size	Water, service provider; sewage landlord	[€ 0.5/m^2 - €0.6/ m^2]	5-10%
Property insurance (risk, liability etc.)	all costs	-	Service provider	[€ 0.05/m^2 - €0.1/ m^2]	1-2%
Cleaning	none	-	Landlord	-	-
Waste disposal	none	-	Landlord	-	-
Maintenance/repair (non structural parts of building)	running costs only	-	Landlord	-	-
Maintenance/repair (structural parts of building)	none	-	Landlord	-	-
Property tax	none	-	Landlord	-	-
Data source and reference year				Expats, 2015. Prague TV, 2015	Expats, 2015. Prague TV, 2015

3.1.2 "Green" premiums, advantages and risks of energy efficiency refurbishments

In Czech Republic there is no reliable empirical information available about "green" premiums in the rental market. The rent pricing structure of a large municipal housing agency is given as an example in the below factsheet. However, this particular example might not be representative of the Czech rental market, but rather individual properties in North Moravia region. In the long run, the availability of renovated dwellings and therefore the dynamics of the rental market are expected to include "green" premiums. The impact is expected to be only noticeable in large cities, especially in Prague.

Report	D 5.2: Fact Sheets Regarding "Green-Premiums" for Energy Efficiency
Section of report	Country section 2: “Green” premiums, advantages and risks of energy efficiency refurbishments
Fact sheet 3.1.2.1	Market impact evaluation of green premium issues by region

Table 11: Czech Republic market impact evaluation of green premium issues by region

Variable	rent premium impact	Size of rent premium	Value premium impact	Size of value premium	Vacancy/lettability	Size of lettability premium
National average	Low but increasing		low, but increasing			Low
Capital/largest cities	Low but increasing		low, but increasing			Low
Cities	Low	1) Baseline: Unrefurbished (F,G) 2) Approx. energy class (E) +11*% premium 3) Approx. energy class (D) +17*% premium 4) Approx. energy class (C) +22*%	low, but increasing			Low
Towns and suburbs	Low		low, but increasing			Low
Rural areas	None		None			Low
Growth regions	Low		low, but increasing			Low
Declining regions	None		None			Low
Data source and reference year	Expert assessment	Data from a municipal housing agency from the North Moravia region.				Expert assessment
Remarks	Empirical information not available	Price structure is not representative of the Czech rental market. *Based on cold rent.				Empirical information not available

3.2 Denmark

3.2.1 Rent level and operating costs issues in the market based rental housing sector

Residential property prices in Denmark have been growing in recent years, after a slow recovery from the financial crisis of 2008. Particularly, since the middle of 2012, the Danish central bank has been pursuing a negative interest rates to ,among other objectives, defend the krone's peg to the euro. This has fuelled house prices in major cities across Denmark, for example, according to Bloomberg, apartment prices per square meter in Copenhagen soared to 43 percent between the start of 2010 and the end of 2015. East Jutland have also seen high growth rate of property prices. While the rural areas of Denmark experienced stagnant or slightly increasing property prices. Likewise, in recent years, rental prices have grown in major cities as low vacancies (national average of 2.7% over the last five years) and strong demand have boosted rental prices. For example, since 2008 rents have increased by more than 30% in Copenhagen and the most recent average rental yield is estimated to be at 4.91%. In other major cities, favourable rental yields of 8.18% in Herning, 6.28% in Helsingor and 5.81% Odense are found.

The second factsheet shows energy prices and growth dynamic for Danish households. Electricity, gas, heating oil and wood pellets are the most common energy sources in Denmark. In the past 5 years, both electricity and gas prices have experienced a low or negative growth. Despite this, for medium-size households, electricity prices during the second semester of 2015 were higher than any other EU country at 0.304 Euro per kWh (Eurostat 2015). This is not surprising as Danish energy taxes are relatively high and make up more than 69% of the final price.

In terms of running costs, the average utility bill for an average 85 square metre apartment with two persons household was about €170 per month in 2015. This is about 9% of the average rental price for such apartment in Denmark (Numbeo, 2015). The operating costs bearings and levels are shown in the third factsheet.

Report	D 5.2: Fact Sheets Regarding "Green-Premiums" for Energy Efficiency
Section of report	Country section 1: Rent level and operating cost issues in the market based rental housing sector
Fact sheet 3.2.1.1	Regional rental market disparities

Table 12: Denmark regional rental market disparities

Variable	5 years market rent dynamics	5 years sales price dynamics	Gross Annual Rental Yield (City Centre)	Vacancy Rate % income	Total Return on Inv. (over 5 years)
National average	high growth (>5% p.a.)	high growth (>5% p.a.)	4.63%	2.7%	5.3%
Copenhagen	high growth (>5% p.a.)	high growth (>5% p.a.)	4.91%	-	-
Copenhagen suburbs	high growth (>5% p.a.)	high growth (>5% p.a.)	Frederiksberg:4.36%	-	-
North zealand	medium growth (2% to 5% p.a.)	medium growth (2% to 5% p.a.)	Helsingor: 6.28%	-	-
East Jutland	high growth (>5% p.a.)	high growth (>5% p.a.)	Arhus: 4.81% Randers: 3.39% Horsens: 6.6%	-	-
West- and South zealand	-	-	Esbjerg: 5.81%	-	-
Funen	negative/low growth (<2% real p.a.)	negative/low growth (<2% real p.a.)	Odense:5.02% Svendborg:4.3%	-	-
South Jutland	negative/low growth (<2% real p.a.)	negative/low growth (<2% real p.a.)	Herning: 8.18%	-	-
West Jutland	medium growth (2% to 5% p.a.)	medium growth (2% to 5% p.a.)	Skive:2.46%	-	-
North Jutland	medium growth (2% to 5% p.a.)	medium growth (2% to 5% p.a.)	Aalborg:4.41%	-	-
Bornholm	medium growth (2% to 5% p.a.)	medium growth (2% to 5% p.a.)	-	-	-
Data source and reference year	Nationalbanken, 2015	Sadolin-albaek, 2015	Prime asset investments, 2015	-	-

Report	D 5.2: Fact Sheets Regarding "Green-Premiums" for Energy Efficiency
Section of report	Country section 1: Rent level and operating costs issues in the market based rental housing sector
Fact sheet 3.2.1.2	Energy delivery tariff structures and prices

Table 13: Denmark energy delivery tariff structures and prices

Variable	Two-part tariff for heat energy delivery?	Average basic rate in heat energy delivery contracts	Current energy unit rate per unit heat energy consumed	Basic rate growth	Unit price growth
household electricity, consumer price	Yes	€ 772 per year	0.297€ per kWh	negative/low growth (<2% real p.a.)	negative/low growth (<2% real p.a.)
household "green" electricity (in some countries zero Co2 power is available), consumer price	Yes - e.g. windpower - Price is slightly higher than standard electricity				
heating gas, consumer price	Yes		0.108€ per kWh	negative/low growth (<2% real p.a.)	negative/low growth (<2% real p.a.)
heating oil, consumer price	Yes		0.159€ per kWh		
renewables (e.g. wood pellets) consumer price	Yes - rare in rental housing, but used in Detahced homes. e.g. in Aarhus, the second largest City				
district heating (long-distance)		€1522 per year	0.11 €per kWh		
block heating local)	Yes				
contracting					
Data source and reference year	ENS (Danish Energy Agency), 2016		ENS (Danish Energy Agency), 2016		ENS (Danish Energy Agency), 2016

Report	D 5.2: Fact Sheets Regarding "Green-Premiums" for Energy Efficiency
Section of report	Country section 1: Rent level and operating costs issues in the market based rental housing sector
Fact sheet 3.2.1.3	Operating costs

Table 14: Denmark operating costs

Variable	Operating costs bearing (typical national practice)	Metering	Involved contract parties	Average regular costs	share of operating costs in total rent
Household electricity	all costs	metering	service provider	Average utility cost: 9.4% Electrcity, heating, water and waste €170 per month	
Household heat energy	all costs	metering	service provider		
Water/sewage	all costs	metering	service provider		
Property insurance (risk, liability etc.)	N/A	N/A	N/A		
Cleaning	all costs	by apartment size	Landlord	€26	1.4%
Waste disposal	all costs	by apartment size	Landlord	N/A	N/A
Maintenance/repair (non structural parts of building)	all costs	by apartment size	Landlord		
Maintenance/repair (structural parts of building)	N/A	N/A	N/A		
Property tax	all costs	by apartment size	Landlord		
Data source and reference year	BVS (Boligøkonomisk Videncenters), 2016			Expatistan, 2016	Numbeo, 2015

3.2.2 Green premiums, benefits and risks of energy efficiency refurbishments

In Denmark there is no information on empirical rental premium or lower vacancy rates due to improved energy efficiency standards. Yet, a recent study by Jensen et al., (2016) reports that energy performance rating of properties plays an important role in relation to sale price. Particularly, properties with an A/B rating are reported to have an average green sales premium of 6.6 per cent relative to properties with a D rating. While properties in the C category are found to achieve a green sale premium of 5.1 per cent relative to those in the D category. These figures are summarised in the below factsheet.

Report	D 5.2: Fact Sheets Regarding "Green-Premiums" for Energy Efficiency
Section of report	Country section 2: “Green” premiums, advantages and risks of energy efficiency refurbishments
Fact sheet 3.2.2.1	Market impact evaluation of green premium issues by region

Table 15: Denmark market impact evaluation of green premium issues by region

Variable	rent premium impact	Size of rent premium	Value premium impact	Size of value premium	Vacancy/lettability	Size of lettability premium
National average	-	-	High	A/B-rated premium of 6.6% and c-rated premium of 5.1%.	-	-
Capital/largest cities (500k+inhabitants	-	-	-	-	-	-
Cities (e.g. 50+k inhabitants)	-	-	-	-	-	-
Towns and suburbs	-	-	-	-	-	-
Rural areas	-	-	-	-	-	-
Growth regions	-	-	-	-	-	-
Declining regions	-	-	-	-	-	-
Data source and reference year	-	-	Jensen et al., (2016)	Jensen et al., (2016)	-	-

3.3 France

3.3.1 Rent level and operating costs issues in the market based rental housing sector

Following the global financial crisis of 2008, the French residential market proved resilient as a period of recovery quickly followed and by the end of 2011, house prices and transaction levels in major cities exceeded the pre-crises level of 2007 (Savills, 2016). Yet in recent years, the Eurozone debt crisis and the rising domestic unemployment levels have led to stagnation of house prices. In contrast to other major European capitals such as London and Berlin where prices have sharply increased, property prices in Paris have altered very little since 2012. For instance, metropolitan house prices across France fell by 2.75% during the year to 2015 (INSEE, 2016). At the same time, the growth rate of rental prices has been low. According to the rental housing observatory (Clameur) rents fell by an average of 1.1% in 2015, to a national average rent of €12.50 per square metre. This is largely attributed to the common practice in France of long-term tenancy agreements and legal restrictions on raising rents during the contract period as well as high vacancy rates in recent years (10.56% in 2015). In terms of rental yields and long-term returns on investment, in the last couple of years, yields on apartments in Paris area have been poor but relatively average in Poitou-Charentes, Marseille and Midi Pyrénées. The aforementioned figures are summarised in the first factsheet.

France generates a large share of its electricity from nuclear power; electricity is among the cheapest in Europe but has been growing over the last 5 years. In addition to electricity, French households predominately use gas, heating oil and wood for heating and hot water. The government offers tax credits for the installation of energy systems running on renewable fuel such as wood and solar energy. In recent years, gas prices have been stable, heating oil prices had a negative growth rate and prices of renewable energy sources have been increasing moderately.

In terms of operating costs, French households are often billed for electricity every three months but may receive bi-monthly or monthly bills if the consumption is above a certain level. Bills include the standing charge, VAT and local taxes. VAT is charged at 5.5 per cent on the standing charge and 19.6 per cent on the total power consumption (Just Land-

ed, 2016). Gas bills depend on the type of supply sought, for example for cooking only, for cooking and hot water and for heating. The average annual regular costs are €12.5 per square metre for household heat energy and €6.5 per square metre for water/sewage supply. Operating costs ranges between 7-14% of the total expenses on housing depending on the household type. These figures are summarised in the third factsheet of this section

Report	D 5.2: Fact Sheets Regarding "Green-Premiums" for Energy Efficiency
Section of report	Country section 1: Rent level and operating costs issues in the market based rental housing sector
Fact sheet 3.3.1.1	Regional rental market disparities

Table 16: France regional rental market disparities

Variable	5 years market rent dynamics	5 years sales price dynamics	Gross Annual Rental Yield	Vacancy Rate per square metre	Total Return on Inv. (over 5 years)
National average	Negative / low growth (-0,40%: 2012-2016)	negative/low growth (<2% real p.a.)	3.0%	10.56%	6.4%
Paris Ile de France	Negative / low growth (-0,40%: 2012-2016)	negative/low growth (<2% real p.a.)	3.42%	-	6.8%
Marseille PACA	Negative / low growth (-0,40%: 2012-2016)	negative/low growth (<2% real p.a.)	5.74%	-	3.5%
Lyon /Rhone ALpes	Negative / low growth (-0,40%: 2012-2016)	negative/low growth (<2% real p.a.)	5.16%	-	7.3%
Toulouse / Midi Pyrénées	Negative / low growth (-0,40%: 2012-2016)	negative/low growth (<2% real p.a.)	5.54%	-	Rest of Ile de France 6.1%
Niort /Poitou-Charentes	Negative / low growth (-0,40%: 2012-2016)	negative/low growth (<2% real p.a.)	7.69%	-	
Data source and reference year	Clameur, 2016	Clameur, 2016	Clameur, 2016	IPD, 2015	IPD, 2015

Report	D 5.2: Fact Sheets Regarding "Green-Premiums" for Energy Efficiency
Section of report	Country section 1: Rent level and operating costs issues in the market based rental housing sector
Fact sheet 3.3.1.2	Energy delivery tariff structures and prices

Table 17: France energy delivery tariff structures and prices

Variable	Two-part tariff for heat energy delivery?	Average basic rate in heat energy delivery contracts	Current energy unit rate per unit heat energy consumed	Basic rate growth	Unit price growth
household electricity, consumer price	Yes	From 355 to 371 € per year for an average consumption of 2200kwh	0.1636 €/kwh to 0.1144 €/kwh	-	+ 6.6% / year high growth (>5% p.a.)
household "green" electricity (in some countries zero Co2 power is available), consumer price	No		0.1435 €/hwh to 0.1642 €/kwh	-	+3.17% per year medium growth (2% to 5% p.a.)
heating gas, consumer price	No	From 442 to 470 € for an average consumption of 8000 kwh.	0.04693 €/kwh to 0.04910 €/kwh	-	+ 1% per year negative/low growth (<2% real p.a.)
heating oil, consumer price	No	-	0.0778 €/kwh (2015)	-	**3.3.2 4.8% per year** **3.3.3 negative/low growth (<2% real p.a.)**
renewables (e.g. wood pellets) consumer price	No	-	0.0645 €/kwh	-	+3.17% per year medium growth (2% to 5% p.a.)
district heating (long-distance)	No		0.0524 €/kwh	-	-
block heating local)	No	-	-	-	-
contracting	Yes	-	-	-	-
Data source and reference year	ED,F 2015	www. fournisseurs-électricité.com	EDF, 2016 ELYOTHERM, 2016		projet-gaz.grdf, 2015

Report	D 5.2: Fact Sheets Regarding "Green-Premiums" for Energy Efficiency
Section of report	Country section 1: Rent level and operating costs issues in the market based rental housing sector
Fact sheet 3.3.1.3	Operating costs

Table 18: France operating costs

Variable	Operating costs bearing practice	Metering	Involved contract parties	Average regular costs	share of operating costs
Household electricity (common parts)	All costs	Metering	Service provider	-	From 7 to 14 % of the total expenses for the housing / National average
Household heat energy	Running costs, maintenance repairs	Metering for individual heating/ per apartment size for collective heating	The landlord	12.5 €/m²/year	-
Water/sewage		Metering	The landlord (mutlifamilies)/ Service provider (single families	6.1 € /m²/year	-
Property insurance (risk, liability etc.)	A specific insurance is mandatory	A specific insurance is mandatory	Insurance company	-	-
Cleaning	All costs (for common parts)	By apartment size	Landlord	7.9€/m²/year	-
Waste disposal	All costs	Tax defined by apartment size	Landlord	-	-
Maintenance/repair (non structural parts of building)	All costs	By apartment size	Landlord	-	-
Maintenance/repair (structural parts of building)	None (all included in the rent)	None (all included in the rent)	None (all included in the rent)	-	-
Property tax	None (all included in the rent)	None (all included in the rent)	None (all included in the rent)	-	-
Data source and reference year	Decret n°87-713 du 26 août, 2016	Decret n°87-713 du 26 août ,2016	DELPHIS, 2016	OLAP Survey, 2013	OLAP Survey, 2013

3.3.4 Green premiums, advantages and risks of energy efficiency refurbishments

According to preliminary studies conducted by Ecole des Ponts, Paris Institute of Technology, green rental premium in the French housing market varies between 2% and 10% of the rental price of an average rental unit depending on the dwelling type. The impact is reported to be twice as high for family houses compared to apartment units. Though, no green rental premium was found for the Paris area, possibly due to supply constraints and low vacancy rates which may suggest that tenants are price-takers even for inefficient properties. In areas with a low local economic dynamic and a high vacancy rate, there is likely to be a competitive advantage in raising the energy performance of the existing housing stock. Turning to green sales premiums, preliminary evidence from Marseille and Lille (see European Commission report, 2013) indicates that energy efficiency is rewarded in the French housing market, particularly apartments in Marseille and houses in Lille. A one level improvement in energy efficiency is estimated to yield 3.2% in Lille and 4.3% in Marseille. Results suggest that higher green premiums are to be expected in cities more dependent on energy for heating. These findings are consistent with an empirical investigation of the impact of energy efficiency labelling on the sales prices of residential properties in France (Notaires De France, 2013). In this study, differences in green premiums between rural and/or declining regions on one side and the growing regions on the other are reported. For the former, no green premiums are found but rather a green discount ranging between 5% and 9% for properties in the lowest energy performance category of EFG. Yet, an average reduced vacancy rate between 6% and 10% is reported for properties in the highest energy performance category of ABC relative to the average D category. On contrary, in growing regions (Rhône-Alpes or Ile-de-France), green price premiums between 10% and 14% are found for properties in the AB category, 3% and 6% for those in the C category and price discounts between 3% and 6% for those in the FG category. In these growing regions, there is almost no vacancy except for technical reasons. The below factsheet summarised the various green premiums in the French housing market.

Report	D 5.2: Fact Sheets Regarding "Green-Premiums" for Energy Efficiency
Section of report	Country section 2: “Green” premiums, advantages and risks of energy efficiency refurbishments
Fact sheet 3.3.2.1	Market impact evaluation of green premium issues by region

Table 19: France rental and sales premiums and Vacancy premium

Variable	rent premium impact	Size of rent premium	Value premium impact	Size of value premium	Vacancy/lettability	Size of lettability premium
National average	High	2-10 %	-	-	-	-
Capital/largest cities	-	-	High	AB = 10% C = 3% EFG = - 3 to 6%	Low	-
Cities (e.g. 50+k inhabitants)	-	-	High	AB = 10% C = 3% EFG = - 3 to 6%	Average	-
Rural areas (Centre Val de Loire)	-	-	None	E= - 7% FG= -14%	High	-
Growth regions (Rhône Alpes)	-	-	High	AB= 11% C= 5% E= -2% FG = -7%	Low	-
Declining regions (Champagne Ardennes – Lorraine)	-	-	None	EFG = -9%	High	An average vacancy rate of 4.5%
Data source and reference year	-	-		Notaires De France, 2013	Notaires De France, 2013	Notaires De France, 2013

3.4 Germany

3.4.1 Rent level and operating costs issues in the market based rental housing sector

The five year rental price dynamic for Germany, shown in below factsheet, suggests a 3.1 % price growth nationally an annual growth of 4.8 % for the seven growing sub-markets of Hamburg, Berlin, Munich, Stuttgart, Frankfurt, Cologne and Dusseldorf. The highest rise in rental prices was observed for Berlin, with an annual average growth of 7.3 %. The second highest growth rate was observed in the City of Dusseldorf with an average growth rate of 5.8 %, followed by Frankfurt at 4.5 % and Hamburg and Munich at 3.6 %. While low growth rates were observed in Stuttgart and Cologne at 2.8 % and 2.7%, respectively. In addition to the growth in rental prices, after several years of upward movement, sales prices continue to surge. For instance, sales prices increased by 5.6 % over the past 5 years nationally and by 9.3% for the growing sub-markets. Beyond price dynamics, Germany`s rental yields have been low in recent year and ranges between 3% and 4% in major urban areas. This is partly because of the recent price growth, but more importantly because investment in housing are no longer heavily subsidised by the state. Rental yield was highest in Dusseldorf (3.98%) and lowest in Munich (3.05%) among the urban regions. Furthermore, in 2015, the average vacancy rate as percentage of rental value was 1.9% nationally and total return on the investment was 8.4% over the past 5 years.

Given the recent surge in wind and solar power under a national plan to acquire most of domestic power from renewables, electricity prices have been falling. Over the past 5 years, heating oil prices have also been falling, as have natural gas prices, both of which are commonly used by German households. The second factsheet summarises the prices and developments of domestic energy sources.

German`s housing costs can be split into two groups: on the one hand costs that are covered by the tenant, and on the other hand costs, that are legally tied to the landlord. Costs covered by the tenants are generally associated with operating costs, which are directly linked to the property itself. Utility costs are typically not included in the “cold” rent (Kaltmiete) i.e. without heating or utilities. Given the low rental prices, about 66% of the value of the rental prices is spent on heating alone. The operating costs bearings and levels are shown in the third factsheet.

Report	D 5.2: Fact Sheets Regarding "Green-Premiums" for Energy Efficiency
Section of report	Country section 1: Rent level and operating costs issues in the market based rental housing sector
Fact sheet 3.4.1.1	Regional rental market disparities

Table 20: Germany regional rental market disparities

Variable	5 years market rent dynamics	5 years sales price dynamics	Gross Annual Rental Yield City Centre	Vacancy Rate % rental income	Total Return on Inv. (over 5 years)
National average	medium growth (2% to 5% p.a.)	high growth (>5% p.a.)	3.78 %	1.9%	8.4%
Top-7	medium growth (2% to 5% p.a.)	high growth (>5% p.a.)	-	-	-
Berlin	high growth (>5% p.a.)	high growth (>5% p.a.)	3.61%	2.6%	7.3%
Munich	medium growth (2% to 5% p.a.)	high growth (>5% p.a.)	3.05%	0.7%	11.1%
Hamburg	medium growth (2% to 5% p.a.)	high growth (>5% p.a.)	3.23%	3.2%	6.6%
Stuttgart	medium growth (2% to 5% p.a.)	high growth (>5% p.a.)	3.57%	2.7%	7.3%
Cologne	medium growth (2% to 5% p.a.)	high growth (>5% p.a.)	3.85%	-	-
Frankfurt	medium growth (2% to 5% p.a.)	high growth (>5% p.a.)	3.53%	4.3%	6.1%
Dusseldorf	high growth (>5% p.a.)	high growth (>5% p.a.)	3.98%	0.2%	4.4%
Data source and reference year	DG HYP, 2015	Bloomberg,2016	Prime asset investments, 2015	IPD, 2015	IPD, 2015

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Report	D 5.2: Fact Sheets Regarding "Green-Premiums" for Energy Efficiency
Section of report	Country section 1: Rent level and operating costs issues in the market based rental housing sector
Fact sheet 3.4.1.2	Energy delivery tariff structures and prices

Table 21: Germany energy delivery tariff structures and prices

Variable	Two-part tariff for heat energy delivery?	Average basic rate in heat energy delivery contracts	Current energy unit rate per unit heat energy consumed	Recent basic rate increases	Recent energy unit price increases
household electricity, consumer price	Yes (basic fee + consumption-related tariff)	€6-15	€0.22	Stable, negative/low growth	Negative/low growth (< 2 % real p.a.)
household "green" electricity (in some countries zero Co2 power is available), consumer price		€6-15	€0.25	Stable, negative/low growth	Negative/low growth (< 2 % real p.a.)
heating gas, consumer price		€10-30	€0.065	negative/low growth	Stable, negative growth
heating oil, consumer price	No	n/a	€0.059	n/a	Negative growth
renewables (e.g. wood pellets) consumer price	No	n/a	€0.046	n/a	Stable, low growth (< 2 % real p.a.)
district heating (long-distance)	Yes	200 Euros per unit per month for 20kW, up to 270 Euros per unit per month for 60 kW including warm water	€0.093	n/a	medium growth (2% to 5% p.a.)
block heating local)	Yes	n/a (Service fee)	€0.14	n/a	Negative/low growth (< 2 real p.a.)
contracting	Yes	*€3* per day	0,06 - 0,10	Stable, negative/low growth	Depending on underlying energy, typically rather stable
Data source and reference year	Own fieldwork, 2016	BDEW , 2016 Thermondo, 2016 Thermoplus, 2016	BDEW , 2016 Thermondo, 2016 Solares bauen GmbH, 2016	BDEW,2016	BDEW , 2016
Remarks				VIK, 2016: Energy Price Index (Households and B asis Price); Thermondo, 2016; energy consumer association, 2016	

Report	D 5.2: Fact Sheets Regarding "Green-Premiums" for Energy Efficiency
Section of report	Country section 1: Rent level and operating costs issues in the market based rental housing sector
Fact sheet 3.4.1.3	Operating costs

Table 22: Germany operating costs

Variable	Operating costs bearing Practice	Metering	Involved contract parties	Average regular costs per m² rented area	share of operating costs in total rent
Household electricity	running costs only	metering	Service Provider	0.25-0.50 (depends largely on household size, as relation to sq.m. is not linear) – General Electrcity of the Building 0.05	Not part of operating costs in the original sense (tenant pays extra)
Household heat energy	running costs, maintenance	Shared between metering (typically 70 %) and lump sum (30 %) in newer buildings, in older buildings only metering or only categorical	Landlord	Depends on energy carrier, but average value including warm water is 1.51	66 %
Water/sewage	running costs, maintenance	Typically metering	Landlord	0.34	15 %
Property insurance (risk, liability etc.)	All costs	Lump sum (divided)	Landlord	0.15	6.6 %
Cleaning	All costs	Lump sum (divided)	Landlord or (rather exceptionally) Service Provider	0.5 (+ 0.04 for street cleaning)	8.3 %
Waste disposal	All costs	Lump sum (divided)	Landlord	0.16	7.0 %
Maintenance/repair (non structural parts of building)	none (all included in rent)	Lump sum (divided)	Landlord	Elevators 0.16, gardens 0.10, chimney 0.03	12,7 %
Maintenance/repair (structural parts of building)	none (all included in rent)	n/a			
Property tax	All costs	By apartment size or Lump sum (divided)	Landlord	0.18	
Data source and reference year	based on Betriebskostenverordnung (National Directive)			based on Betriebskostenspiegel, 2013 (Operating Costs Review)	based on Betriebskostenspiegel, 2013 (Operating Costs Review)

3.4.2 “Green” premiums, advantages and risks of energy efficiency refurbishments

Empirical studies on rental premiums for energy-efficient rental properties are scarce. Yet, some market evaluation of the rent index for the City of Tübingen provides evidence of a 6 % rent increment for dwellings with a high energy performance. While the rent index of the City of Darmstadt indicates a surge in rental income of up to 7% for rental units with an extensively improved environmental quality. Whereas, an 8% increment in rental price is found for energy efficient properties in the City of Überlingen. These figures are supported by an empirical study by Cajias and Piazolo (2013) in which efficient buildings are found to yield up to 3.15% higher returns and 0.76 €/m2 higher rents than inefficient buildings. In terms of additional green premiums within the German rental market, Lehner (2013) suggests, that vacancy rates of sustainable buildings are likely to decrease due to lower rental loss risk. This is in line with the empirical findings of GdW (Bundesverband deutscher Wohnungs- und Immobilienunternehmen) in which reduced vacancy rates are found in sustainable city and quartier developments. Further evidence is also reported by the GESOBAU AG and their development activities in the “Märkisches Viertel”. They report a significant decrease in vacancy rates after modernisation. For the entire portfolio they report a vacancy rate of 4.67 %, whereas modernised dwellings are vacant by a rate of 2.49 %. Turning to green sales premiums, Cajias and Piazolo (2013) report that a percentage increase in energy conservation boosts market value by 0.45%. In related research, Kholodilin and Michelsen (2014) study the residential rental market in Berlin and find that energy efficiency savings are generally capitalised into sales prices.

Report	D 5.2: Fact Sheets Regarding "Green-Premiums" for Energy Efficiency
Section of report	Country section 2: “Green” premiums, advantages and risks of energy efficiency refurbishments
Fact sheet 3.4.2.1	Market impact evaluation of green premium issues by region

Table 23: Germany market impact evaluation of green premium issues by region

Variable	rent premium impact	Size of rent premium	Value premium impact	Size of value premium	Vacancy/lettability	Size of lettability premium
National average	High	1 % increase in energy consumption: -0.08 % rent	High	1 % increase in energy consumption: -0.45 % market value .	High	East Germany: Drop from 17 % vacancy to 9 % West Germany: Decrease from 3 % to 2.3 % after sustainable development
Capital/largest cities (500k+inhabitants	-	-	-	-	-	Vacancy rates drop from 4.67 % to 2.49 after modernisation
Cities (e.g. 50+k inhabitants)	High	6 % rent premium, when building has “good energy standard”	-	-	-	-
Towns and suburbs	High	8 % increase of rents for ecologically improved buildings	-	-	-	-
Data source and reference year		Cajias, Piazolo (2013). City of Darmstadt (2010) . City of Tübingen Rental index (2013) City of Überlingen		Cajias, Piazolo (2013) Wameling (2010)		GdW (2013) GESOBAU AG (2014)

3.5 Netherlands

3.5.1 Rent level and operating costs issues in the market based rental housing sector

In the Netherlands, residential rents have grown moderately over the past 5 years with an average yearly rate of 3.4%. In Amsterdam, the rent increased by 3.1% while it increased by 2.1% in The Hague. Conversely, the average sale price index has decreased over the past 5 years with an average annual negative growth of 2.4%. The North performed the worst with a decrease of 3%, followed by the South and East with 2.8% and the west with 1.8% decrease, respectively. Amsterdam experienced an average annual sales growth of 0.7% over the past 5 years. Similarly, the major cities in the Netherlands show small differences in total return over the last few years. Rotterdam residential market saw negative capital growth leading to a zero total return; whereas Utrecht saw a 1.6% overall return for this period (Catella 2014). The market downturn between 2009 and 2014 also led to significant increases in initial yields – ranging from 8.72% in The Hague to 5.36% in Amsterdam. Nonetheless, vacancy rates are relatively low in the Dutch rental market with an average 2.5% reported in 2015.

Gas and electricity are the common fuel types in rental units in Netherlands. Some apartments may also be heated by a district heating scheme which is paid separately. With a few subsidies available, solar panels installations are also becoming more popular. Energy prices have been relatively stable over the past five years, the electricity prices have decreased slightly and the gas prices have increased on average between 2010 and 2014. The stable energy prices are attributable to various factors. In recent years, a number of gas-fired plants were taken out of operation, and cheaper electricity was imported from Norway and Germany on a large scale via land-based and subsea electricity connections (Tennet, 2016). Average price levels and growth dynamics for the two most common fuel types; gas and electricity are summarised in the second factsheet.

Depending on their usage patterns, Dutch households tend to pay a monthly bill of around €120 for a standard apartment and up to €200 for a larger dwelling. In terms of water and sewage bill, households typically pay a €42 annual standing charge plus €1.57 per cubic meter of water used. Sewerage charges amount to about €150 per year. Waste disposal fees are included in the annual city council tax bill which varies within and across cities.

According to Amsterdam Tips, in 2015 waste collection fees in Amsterdam were €240 for single occupancy and €320 for multiple occupancy.

Report	D 5.2: Fact Sheets Regarding "Green-Premiums" for Energy Efficiency
Section of report	Country section 1: Rent level and operating costs issues in the market based rental housing sector
Fact sheet 3.5.1.1	Regional rental market disparities

Table 24: Netherlands regional rental market disparities

Variable	5 years market rent dynamics	5 years sales price dynamics	Gross Annual Rental Yield City Centre	Vacancy Rate % rental income	Total Return on Inv. (over 5 years)
National average	*medium growth (2% to 5% p.a.)*	*negative/low growth (<2% real p.a.)*	5.98%	2.5%	0.7%
Amsterdam	*medium growth (2% to 5% p.a.)*	*negative/low growth (<2% real p.a.)*	5.36%	-	0.7%
Rotterdam	*medium growth (2% to 5% p.a.)*	*negative/low growth (<2% real p.a.)*	6.3%	-	0.1%
The Hague	*medium growth (2% to 5% p.a.)*	*negative/low growth (<2% real p.a.)*	8.72%	-	0.5%
Utrecht	*medium growth (2% to 5% p.a.)*	*negative/low growth (<2% real p.a.)*	5.93%	-	1.6%
Data source and reference year	CBS, 2016	CBS, 2016	Prime asset investments, 2015	IDP, 2015	IDP, 2014

Report	D 5.2: Fact Sheets Regarding "Green-Premiums" for Energy Efficiency
Section of report	Country section 1: Rent level and operating costs issues in the market based rental housing sector
Fact sheet 3.5.1.2	Energy delivery tariff structures and prices

Table 25: Netherlands energy delivery tariff structures and prices

Variable	Two-part tariff for heat energy delivery?	Average basic rate in heat energy delivery contracts	Current energy unit rate per unit heat energy consumed	Recent basic rate increases	Recent energy unit price increases
household electricity, consumer price	yes	€467.50 year	€0.187 per kWh	-	*negative/low growth (<2% real p.a.)*
household "green" electricity (in some countries zero Co2 power is available), consumer price	yes	-	-	-	
heating gas, consumer price	yes	€1472 year	€0.12 per kWh	-	*negative/low growth (<2% real p.a.)*
heating oil, consumer price	no				
renewables (e.g. wood pellets) consumer price	yes	-	-	-	-
district heating (long-distance)	yes	-	-	-	-
block heating local)	yes	-	-	-	-
Data source and reference year		CBS, 2016	CBS, 2016		CBS, 2016

Report	D 5.2: Fact Sheets Regarding "Green-Premiums" for Energy Efficiency
Section of report	Country section 1: Rent level and operating costs issues in the market based rental housing sector
Fact sheet 3.5.1.3	Operating costs

Table 26: Netherlands operating costs

Variable	Operating costs bearing	Metering	Involved contract parties	Average regular costs	share of operating costs in total rent
Household electricity	*All costs*	Metering	Service provider	Monthly energy bill of €120 for apartment and €200 for a larger dwelling	17% (based of average rental value of €1145 per month for a large dwelling
Household heat energy	*All costs*	Metering	Service provider		
Water/sewage	All costs	Metering	Service provider	Water: €42 annual standing charge plus €1.57 Sewage: €150 per year	3%
Property insurance (risk, liability etc.)	None				
Cleaning	*All costs*				
Waste disposal	All costs	By household size		Council tax per year including waste disposal: €240 for single occupancy and €320 for multiple occupancy	2%
Maintenance/repair (non structural parts of building)	All costs	-	-	-	-
Maintenance/repair (structural parts of building)	None				
Property tax	None				
Data source and reference year				Amsterdamtips, 2015	Combination Amsterdamtips, 2015 and average rental prices from Numbeo,2015

3.5.2 "Green" premiums, advantages and risks of energy efficiency refurbishments

Information on empirical rental premium or vacancy premiums is currently not available in the Dutch private rented market. Yet preliminary analysis by Aydin et al, 2016 points to green rental premiums for properties with favorable energy performance labeling. In terms of sales prices, Brounen and Kok (2011) report that in Netherlands, residential properties with a "green" label rated A, B and C command sale price premiums of 10%, 5.5% and 2.2% relative to properties rated D. Interestingly, researcher at TIAS Business also find that a red G-label, reduces the average sale price by EUR 14,000, while homes sold with a green A-label sell at a premium of 7 thousand euro's, both compared to the average D-labelled dwelling. Besides these price premiums, the sale time is reduced when labels are available. The average labelled dwelling sells 20 days quicker, than when the label is absent.

Report	D 5.2: Fact Sheets Regarding "Green-Premiums" for Energy Efficiency
Section of report	Country section 2: “Green” premiums, advantages and risks of energy efficiency refurbishments
Fact sheet 3.5.2.1	Market impact evaluation of green premium issues by region

Table 27: Netherlands market impact evaluation of green premium issues by region

Variable	rent premium impact	Size of rent premium	Value premium impact	Size of value premium	Vacancy/lettability	Size of lettability premium
National average	average	A, B and C 13%, 9.6% and 4.5% rental price premiums relative to D-rated homes.	average	A, B and C 10%, 5.5% and 2.2% price premiums relative to D- rated homes		
Capital/largest cities	-	-	-	-	-	-
Cities	-	-	-	-	-	-
Towns and suburbs	-	-	-	-	-	-
Rural areas	-	-	-	-	-	-
Growth regions	-	-	-	-	-	-
Declining regions	-	-	-	-	-	-
Data source and reference year	Aydin, Brounen&Hillrichs (2016)	Aydin, Brounen&Hillrichs (2016)	Brounen&Kok (2011)	Brounen&Kok (2011)		

3.6 Poland

3.6.1 Rent level and operating costs issues in the market based rental housing sector

Despite being one of the few European countries to have avoided the financial crisis of 2008, the Polish economy and house prices were hit by the Eurozone debt crisis since 2009. The 5 years price dynamic for Poland is thus negative. Yet from 2014, Polish house prices have increased steadily due to record-low interest rates, and new housing programmes stimulating demand. Demand for rental property is currently on the rise in Poland and rental prices have been increasing over the past few years. This is mainly due to demographic and economic trends (NL Chambers, 2015). The highest rent levels can be found in Warsaw, followed by Krakow, Wroclaw and Poznan. Furthermore, over the past few years, yields have been moderately good in Poland, while gross total return of 6.5% was recorded in the 2012/13 financial year.

The energy sector in Poland is yet to achieve full liberalisation process (European Commission, 2014). Gas and electricity prices for domestic consumption in Poland are set by the government regulator and thus tend to be stable. Over the past 5 years, the growth rate of energy prices has either been negative or low.

Operating costs beating practices and average monthly cost of utilities in Poland are shown in the below factsheet. Based on the average rental price of a family house, heating costs make up 14% of the average rental value.

Report	D 5.2: Fact Sheets Regarding "Green-Premiums" for Energy Efficiency
Section of report	Country section 1: Rent level and operating costs issues in the market based rental housing sector
Fact sheet 3.6.1.1	Regional rental market disparities

Table 28: Poland regional rental market disparities

Variable	5 years market rent dynamics	5 years sales price dynamics	Gross Annual Rental Yield City Centre	Vacancy Rate % rental income	Total Return on Inv. (over 5 years)
National average	medium growth (2% to 5% p.a.)	negative/low growth (<2% real p.a.)	5.0%	-	6.5%
Warsaw	medium growth (2% to 5% p.a.)	negative/low growth (<2% real p.a.)	4.5%	-	
Krakow	medium growth (2% to 5% p.a.)	negative/low growth (<2% real p.a.)	4.22%	-	
Wroclaw	medium growth (2% to 5% p.a.)	negative/low growth (<2% real p.a.)	5.35%	-	
Poznan	medium growth (2% to 5% p.a.)	negative/low growth (<2% real p.a.)	5.09%	-	
Gdansk	medium growth (2% to 5% p.a.)	negative/low growth (<2% real p.a.)	4.09%	-	
Data source and reference year	Global property guide, 2015	Global property guide, 2015	Prime asset invest-ment,2015		Global property guide, 2015

Report	D 5.2: Fact Sheets Regarding "Green-Premiums" for Energy Efficiency
Section of report	Country section 1: Rent level and operating costs issues in the market based rental housing sector
Fact sheet 3.6.1.2	Energy delivery tariff structures and prices

Table 29: Poland energy delivery tariff structures and prices

Variable	Two-part tariff for heat energy delivery?	Average basic rate in heat energy delivery contracts	Current energy unit rate per unit heat energy consumed	Recent basic rate increases	Recent energy unit price increases
household electricity, consumer price	yes	n/a	0.1178 €/kWh	negative/low growth (<2% real p.a.)	negative/low growth (<2% real p.a.)
household "green" electricity (in some countries zero Co2 power is available), consumer price	n/a	n/a	n/a	n/a	
heating gas, consumer price	yes	n/a	0.0491 €/kWh	negative/low growth (<2% real p.a.)	negative/low growth (<2% real p.a.)
heating oil, consumer price	n/a	n/a	0.51 €/litre		
renewables (e.g. wood pellets) consumer price	n/a	n/a	n/a	n/a	n/a
district heating (long-distance)	n/a	n/a	n/a	n/a	n/a
block heating local)	n/a	n/a	n/a	n/a	n/a
Data source and reference year			European climate,2015	European climate,2015	European climate,2015

Report	D 5.2: Fact Sheets Regarding "Green-Premiums" for Energy Efficiency
Section of report	Country section 1: Rent level and operating costs issues in the market based rental housing sector
Fact sheet 3.6.1.3	Operating costs

Table 30: Poland operating costs

Variable	Operating costs bearing	Metering	Involved contract parties	Average regular costs	share of operating costs in total rent
Household electricity	all costs	metering	landlord		
Household heat energy	all costs	metering	landlord	Average utility: *€140*	14%
Water/sewage	all costs	metering	landlord	€25	2.5%
Property insurance (risk, liability etc.)	none	none	landlord	n/a	n/a
Cleaning	all costs	other	landlord	n/a	n/a
Waste disposal	all costs	by household size	landlord	n/a	n/a
Maintenance/repair (non structural parts of building)	-	-	landlord	n/a	n/a
Maintenance/repair (structural parts of building)	-	-	landlord	n/a	n/a
Property tax	none		landlord	n/a	n/a
Data source and reference year				Expats, 2015	Expats, 2015

3.6.2 "Green" premiums, advantages and risks of energy efficiency refurbishments

Currently there is no empirical evidence on green premiums in the Polish residential market. Despite this, Zięba et al. (2013), who examined the commercial real estate market report preliminary evidence that office tenants display strong willingness to pay for superior energy performing office buildings.

Report	D 5.2: Fact Sheets Regarding "Green-Premiums" for Energy Efficiency
Section of report	Country section 2: “Green” premiums, advantages and risks of energy efficiency refurbishments
Fact sheet 3.5.2.1	Market impact evaluation of green premium issues by region

Table 31: Poland market impact evaluation of green premium issues by region

Variable	rent premium impact	Size of rent premium	Value premium impact	Size of value premium	Vacancy/lettability	Size of lettability premium
National average	Currently no empirical evidence available in Poland	-	-	-	-	-
Capital/largest cities	-	-	-	-	-	-
Cities	-	-	-	-	-	-
Towns and suburbs	-	-	-	-	-	-
Rural areas	-	-	-	-	-	-
Growth regions	-	-	-	-	-	-
Declining regions	-	-	-	-	-	-
Data source and reference year	-	-	-	-	-	-

3.7 Spain

3.7.1 Rent level and operating costs issues in the market based rental housing sector

Following the deep slump in the Spanish residential market, recent years have seen the sector improve somewhat despite continues financial difficulties, persistent high unemployment and ever declining population. Over the past 5 years, sales prices have been falling but to a lesser degree relative to previous years. For example, the Bank of Spain released more optimistic house price figures in which prices dropped slightly by 0.1% (but increased by 0.94% when adjusted for inflation) between 2014 and 2015. Over the years, rental prices have also decreased but to a lesser degree in the past two years. Gross rental yields on the other hand, are slowly recovering. They are still not highly attractive for investors, but nevertheless better than they were previously (Global Property Guide, 2015). As shown in the below factsheet, rental yields in Spain ranges from a high of 4.06% in Madrid to a low of 1.73% in Badajoz. Also, figures from the Spanish rental market suggest an improved average vacancy rate of 7.3% in 2013 as well as total return of 8.8% on residential investment.

Spanish energy prices have historically been low, stable and among the cheapest in Europe. However, gas and electricity prices have been increasingly over the past 5 years and are set to continue to rise due to environmental taxes. Whereas, prices of other energy sources such as heating oil have been decreasing.

Operating costs of a Spanish rental unit will vary according to the size, type and location of the property. Electricity is billed every two months based on meter readings and tends to be around €30 for an average house. Gas is cheaper than electricity but only available in the major cities[3]; monthly average bill is about €20 (Costa and Sierra, 2015). Water, on other hand, is an expensive commodity in Spain and tends to average around €35.

[3] The gas pipe-network is installed in most cities from medium size to large size.

Council taxes are generally quite low; the average home is charged about €25 per month. Operating costs bearings and levels in Spain are summarised in the below factsheet. On average, utilities usually make up 17% of total rental value in Spain

3.7.2 "Green" premiums, advantages and risks of energy efficiency refurbishments

Currently there is no empirical evidence on green premiums in the Spanish residential market.

Report	D 5.2: Fact Sheets Regarding "Green-Premiums" for Energy Efficiency
Section of report	Country section 1: Rent level and operating costs issues in the market based rental housing sector
Fact sheet 3.7.1.1	Regional rental market disparities

Table 32: Spain regional rental market disparities

Variable	5 years market rent dynamics	5 years sales price dynamics	Gross Annual Rental Yield City Centre	Vacancy Rate per sqm	Total Return on Inv.
National average	negative/low growth (<2% real p.a.)	negative/low growth (<2% real p.a.)	4.26%	7.3%	8.8%
Madrid	negative/low growth (<2% real p.a.)	negative/low growth (<2% real p.a.)	4.06%	-	-
Barcelona	negative/low growth (<2% real p.a.)	negative/low growth (<2% real p.a.)	3.9%	-	-
Bilbao	negative/low growth (<2% real p.a.)	negative/low growth (<2% real p.a.)	2.67%	-	-
San Sebastian	negative/low growth (<2% real p.a.)	negative/low growth (<2% real p.a.)	2.88%	-	-
Zarautz	negative/low growth (<2% real p.a.)	negative/low growth (<2% real p.a.)	2.16%	-	-
Melilla	negative/low growth (<2% real p.a.)	negative/low growth (<2% real p.a.)	3.03%	-	-
Oviedo	negative/low growth (<2% real p.a.)	negative/low growth (<2% real p.a.)	1.99%	-	-
Cartagena	negative/low growth (<2% real p.a.) nominal=0.35	negative/low growth (<2% real p.a.)	2.23%	-	-
Errenteria	negative/low growth (<2% real p.a.)	negative/low growth (<2% real p.a.)	2.73%	-	-
Valladolid	negative/low growth (<2% real p.a.)	negative/low growth (<2% real p.a.)	2.97%	-	-
Badajoz	negative/low growth (<2% real p.a.)	negative/low growth (<2% real p.a.)	1.73%	-	-
Albacete	negative/low growth (<2% real p.a.)Barcelona=14.8 % real	negative/low growth (<2% real p.a.)	2.74%	-	-
Data source and reference year	Idealista, 2015 PWC, 2015	Ministery of Fomento, 2015 The Bank of Spain, 2015	Prime Asset Investments, 2015	IPD, 2013	Sunny view property, 2016

Report	D 5.2: Fact Sheets Regarding "Green-Premiums" for Energy Efficiency
Section of report	Country section 1: Rent level and operating costs issues in the market based rental housing sector
Fact sheet 3.7.1.2	Energy delivery tariff structures and prices

Table 33: Spain energy delivery tariff structures and prices

Variable	Two-part tariff for heat energy delivery?	Average basic rate in heat energy delivery contracts	Current energy unit rate per unit heat energy consumed	Recent basic rate increases	Recent energy unit price increases
household electricity, consumer price	yes	4.6 kw/basic 200 €/year (house of 90 m2)	0.4021 €/Kw for <1000 kwh 0.2416 €/Kw for 1000-2500 kwh 0.2132 €/Kw for 2500-5000 kwh 0.1906 €/Kw for 5000-15000 kwh 0.1716 €/Kw for >15000 kwh	high growth (>5% p.a.)	high growth (>5% p.a.)
household "green" electricity (in some countries zero Co2 power is available), consumer price	yes	-	-	-	-
heating gas, consumer price	yes	Minimum less than 5000 Kw/year 55.4€/year Betweeen 5000 and 50000 kw/year = 110 €/year	Consumption < 20 GJ 0.09528 20 GJ < Consumption < 200 GJ 0.07597 Consumption > 200 GJ 0.06402	high growth (>5% p.a.)	high growth (>5% p.a.)
heating oil, consumer price	no	No minimum	5 years Av=0 79 €/litre	negative/low growth (<2% real p.a.)	negative/low growth (<2% real p.a.)
renewables (e.g. wood pellets) consumer price	Yes.	-	-	-	-
district heating (long-distance)	-	-	-	-	-
block heating local)	-	-	-	-	-
Data source and reference year	IDEA 2015, Eurostat, 2016	Eurostat, 2016. Gas Natural Fenosa, 2016	Include taxes. Eurostat, 2016	Eurostat 2016	Eurostat 2016

Report	D 5.2: Fact Sheets Regarding "Green-Premiums" for Energy Efficiency
Section of report	Country section 1: Rent level and operating costs issues in the market based rental housing sector
Fact sheet 3.6.1.3	Operating costs

Table 34: Spain operating costs

Variable	Operating costs bearing Practice	Metering	Involved contract parties	Average regular costs	share of operating costs in total rent
Household electricity	all costs	metering	service provider	€ 30	17%
Household heat energy	all costs	metering	service provider	€ 20	
Water/sewage	all costs	metering	service provider	€35	
Property insurance (risk, liability etc.)	none		service provider	-	
Cleaning	all costs	metering	service provider	-	
Waste disposal	all costs	metering	service provider	Council tax: *€25*	
Maintenance/repair (non structural parts of building)	None	-	Landlord	-	
Maintenance/repair (structural parts of building)	None	-	Landlord	-	
Property tax	None	-	Landlord	-	
Data source and reference year	ley de Arrendamientos Urbanos LAU 2013 (Rent Law)		LAU 2013	Costa and Sierra, 2015	

Report	D 5.2: Fact Sheets Regarding "Green-Premiums" for Energy Efficiency
Section of report	Country section 2: “Green” premiums, advantages and risks of energy efficiency refurbishments
Fact sheet 3.5.2.1	Market impact evaluation of green premium issues by region

Table 35: Spain market impact evaluation of green premium issues by region

Variable	rent premium impact	Size of rent premium	Value premium impact	Size of value premium	Vacancy/lettability	Size of lettability premium
National average	Currently no empirical evidence available in Spain	-	-	-	-	-

3.8 . United Kingdom

3.8.1 Rent level and operating cost issues in the market based rental housing sector

According to the latest statistics released by UK`s Office for National Statistics, house prices have significantly grown in the past 5 years. Since the financial crisis of 2011, on average, house prices have risen above the average 2% inflation rate in the UK. House prices vary considerably across regions, with highest average growth recorded in London and the South East and while lowest growth has been recorded in North East and Wales. Similarly, average rental prices have increased moderately over the past 5 years, with an average growth rate of about 5%. The regional make-up of this growth varies, with price growth highest in London, South East and Northern Ireland followed by South West and Midlands with moderate price growth. Whereas Northern England, Scotland and Wales have all experienced low rental growth since 2011. In terms of rental yield, the rate for the different regions ranges between 4% and 6% with a national average of about 5% with low growth regions experiencing the highest rental yield (ARLA, 2014). Based on the same data, over a five year period, the rate of return on buy to let investment is between 9% and 10% with returns highest in low growth regions in Midlands and North. Interestingly, when considering average void period, the north-south divide in rental and sales prices appears to be reversed. The average void period is lowest in London (except prime central London neighbourhoods) and South East and highest in low growth regions in Northern England, Northern Ireland, Wales and Scotland.

Turning to the operating cost of rental properties in the UK, a large majority of households use electricity and gas or a combination of both to heat their homes along with other sources such as heating oil and wood pellets. In recent years, on average, energy prices have been relatively stable but moderately increasing across these energy sources (Bolton, 2016). This has contributed to energy costs making up an average share of 6% of total rental price.

Considering other running costs of rental housing, a recent study by the home insurer More Than, reveals that the average water bill for a three-bedroom home to be €190, while the monthly utility bill comes to €120. Average monthly maintaining costs come to €72,

while the average council tax bill is €150 per month. The research also revealed that the total monthly running costs for a three-bedroom home is just above the average monthly rental price of €2000 in the UK. The below fact-sheets show data related to rent level and operating cost in UK private rented sector.

Report	D 5.2: Fact Sheets Regarding "Green-Premiums" for Energy Efficiency
Section of report	Country section 1: Rent level and operating cost issues in the market based rental housing sector
Fact sheet 3.8.1.1	Regional rental market disparities

Table 36: UK regional rental market disparities

Variable	5 year market rent dynamics	5 year sales price dynamics	Gross Annual Rental Yield	Average Void Period	Net Annual Rental Yield (%)	Rate of Return on Inv. (over 5 years)
National average	*Medium growth (2% to 5% p.a.)*	*High growth (>5% p.a.)*	5.18	19	4.91	9.77
Prime Central London	*High growth (>5% p.a.)*	*High growth (>5% p.a.)*	4.39	20	4.15	9.22
Rest of London	*High growth (>5% p.a.)*	*High growth (>5% p.a.)*	4.34	14	4.16	9.23
Rest of South East	*High growth (>5% p.a.)*	*High growth (>5% p.a.)*	5.10	16	4.87	9.74
South West	*Medium growth (2% to 5% p.a.)*	*High growth (>5% p.a.)*	5.64	18	5.36	10.09
Midlands	*Medium growth (2% to 5% p.a.)*	*High growth (>5% p.a.)*	5.80	19	5.49	10.18
North West	*Negative/low growth (<2% real p.a.)*	*High growth (>5% p.a.)*	5.67	22	5.33	10.07
North East	*Negative/low growth (<2% real p.a.)*	*High growth (>5% p.a.)*	6.45	24	6.03	10.56
Scotland/Wales/NI	*Negative/low growth (<2% real p.a.) but high growth (>5% p.a.) in NI*	*High growth (>5% p.a.)*	5.41	21	5.11	9.91
Data source and reference year	Office for National Statistics, 2016	Experian, 2016	ARLA, 2014	ARLA, 2014	ARLA, 2014	ARLA, 2014

Report	D 5.2: Fact Sheets Regarding "Green-Premiums" for Energy Efficiency
Section of report	Country section 1: Rent level and operating costs issues in the market based rental housing sector
Fact sheet 3.8.1.2	Energy delivery tariff structures and prices

Table 37: UK energy delivery tariff structures and prices

Variable	Two-part tariff for heat energy delivery?	Average basic rate in heat energy delivery contracts	Current energy unit rate per unit heat energy consumed	Basic rate growth	Unit price growth
household electricity, consumer price	Yes	€ 794 per year	€ 0.17 per kWh	Medium growth (2% to 5% p.a.)	Medium growth (2% to 5% p.a.)
household "green" electricity (in some countries zero Co2 power is available), consumer price	N/A	N/A	N/A	N/A	N/A
heating gas, consumer price	Yes	€ 974 per year	€ 0.05 per kWh	Medium growth (2% to 5% p.a.)	Medium growth (2% to 5% p.a.)
heating oil, consumer price	No	-	€ 0.04 per kWh	Medium growth (2% to 5% p.a.)	Medium growth (2% to 5% p.a.)
renewables (e.g. wood pellets) consumer price	No	-	€ 0.05 per kWh	Medium growth (2% to 5% p.a.)	Medium growth (2% to 5% p.a.)
district heating (long-distance)	-	-	-	-	-
block heating local)	-	-	-	-	-
Contracting	-	-	-	-	-
Data source and reference year	Energy Saving Trust and Office for National Statistics, 2016	Energy Saving Trust and Office for National Statistics, 2016	Energy Saving Trust and Office for National Statistics, 2016	Energy Saving Trust and Office for National Statistics, 2016. P Bolton - researchbriefings.files.parliament.uk	Energy Saving Trust and Office for National Statistics, 2016. P Bolton - researchbriefings.files.parliament.uk

Report	D 5.2: Fact Sheets Regarding "Green-Premiums" for Energy Efficiency
Section of report	Country section 1: Rent level and operating cost issues in the market based rental housing sector
Fact sheet 3.8.1.3	Operating costs

Table 38: UK operating costs

Variable	Operating costs bearing (typical national practice)	Metering	Involved contract parties	Average regular costs	share of operating costs in total rent
Household elec-tricity	*Running costs*	Metering	Service provider	Total Utility bill: €120	6%
Household heat energy	*Running costs*	Metering	Service provider		
Water/sewage	Running costs	Metering	Service provider	€90	4.5%
Property insurance (risk, liability etc.)	None	N/A	N/A	N/A	N/A
Cleaning	*All costs*	Lump sum	N/A	€17	0.85%
Waste disposal	All costs	Lump sum	Local Authority	€18	0.9%
Maintenance/repair (non structural parts of building)	Maintenance costs	Lump sum	Landlord	€72	3.6%
Maintenance/repair (structural parts of building)	None	N/A	N/A	N/A	N/A
Property tax	Council tax	Based on property value	Local Authority	*Council tax:* €150	7.5%
Data source and reference year	More Than, 2016	More Than, 2016	More Than, 2016	More Than, 2016	More Than, 2016

3.8.2 Green premiums, benefits and risks of energy efficiency refurbishments

Information on empirical rental premium or lower vacancy rates is currently not available in the UK private rented market. Yet a preliminary study by Adan and Fuerst (2016) points to a rental premium of 5.2-5.3% per square metre for B-rated rental units and a rental premium of 4.6-4.9% per square metre for C-rated rental units. In terms of value premium, Fuerst et al (2015a) report that dwellings in the EPC band A/B sell for a 5% premium, all else equal; and C-rated dwellings sell for C 1.8% premium. Considerable variation in these effects by region and property types is found. For instance, the largest premiums and discounts are found in the region with the lowest house prices — the North East. In regions with the highest house prices (London, South East, South West and East Anglia) there are either lower or no statistically significant price premiums/discounts. In a related research, Fuerst et al (2016), report significant green premiums in the Welsh housing market. For dwellings in bands A and B a premium of 11.3% is found and a premium of 2.1% for dwellings in band C compared to dwellings in band D. These premiums are similar to the findings for North East England, which has similar (relatively low average) house prices as Wales. An analysis of a subset of private rental properties in Wales shows that buy-to-let landlords do not discount below-average energy efficient properties in the same manner as owner occupiers do. The authors attribute this finding to the split incentive problem, i.e. landlords base their willingness to pay on achievable rental values which are net of utility costs as these are borne by the tenants.

Report	D 5.2: Fact Sheets Regarding "Green-Premiums" for Energy Efficiency
Section of report	Country section 2: “Green” premiums, advantages and risks of energy efficiency refurbishments
Fact sheet 3.8.2.1	Market impact evaluation of green premium issues by region

Table 39: UK market impact evaluation of green premium issues by region

Variable	Rent premium impact	Size of rent premium	Value premium impact	Size of value premium	Vacancy/lettability	Size of lettability premium
National average	High	B-rated premium of 5.2-5.3% and c-rated premium of 4.6%- 4.9%	Low	A/B-rated premium of 5% and c-rated premium of 1.8%	High	-
Capital/largest cities (500k+inhabitants	-	-	Low	-	-	-
Cities (e.g. 50+k inhabitants)	-	-	Low	-	-	-
Towns and suburbs	-	-	Average	-	-	-
Rural areas	-	-	High	-	-	-
Growth regions	-	-	Low	-	-	-
Declining regions	-	-	High	-	-	-
Data source and reference year	Adan & Fuerst,2016	Adan & Fuerst,2016	Fuerst et al, 2015	Fuerst et al, 2015	Adan & Fuerst,2016	-

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