Title: Final Stage Impact Assessment for the Private Rented Sector Regulations IA No: DECC0168 Lead department or agency: Department of Energy and Climate Change	Impact Assessment (IA) Date: **30/01/2015** Stage: **Final** Source of intervention: **Domestic** Type of measure: **Secondary legislation** Contact for enquiries: will.lane@decc.gsi.gov.uk
Summary: Intervention and Options	**RPC:** GREEN

Cost of Preferred (or more likely) Option				
Total Net Present Value	Business Net Present Value	Net cost to business per year (EANCB in 2009 prices)	In scope of One-In, Two-Out?	Measure qualifies as
£2.0bn	**£2.9bn**	**-£94.8m**	Yes	Zero Net Cost

What is the problem under consideration? Why is government intervention necessary?

A number of barriers prevent both households and businesses in the Private Rented Sector (PRS) from benefitting from cost-effective energy efficiency measures. These include split incentives - where landlords bear much of the upfront costs while many of the benefits accrue to tenants- landlord or tenant inertia, and imperfect information. Government intervention is required because energy efficiency across both the domestic and non-domestic PRS has an important role in contributing cost-effectively to climate change and fuel poverty commitments. A number of existing policies partially overcome these barriers, particularly where tenancies are long; however, the current policy framework alone will not drive uptake of cost-effective measures in this sector.

What are the policy objectives and the intended effects?

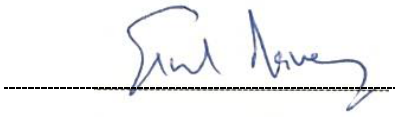
The policy intends to drive cost-effective energy efficiency improvements in the domestic and non-domestic PRS, which would not have occurred otherwise. These energy efficiency improvements will lead to: fewer greenhouse gas emissions, potential economic growth and employment, lower energy bills for businesses and households – including those deepest in fuel poverty, and lower overall energy demand. The policy will also lead to greater energy security, improved air quality, and improved health outcomes as a result of warmer homes.

What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)

Under the final policy option, from April 2018, private landlords seeking to re-let a property that requires an Energy Performance Certificate (EPC) and is 'F' or 'G'-rated must attempt to improve the rating to a minimum of 'E'. They can do this through one or a combination of: 1) taking out a Green Deal (subject to meeting the 'Golden Rule'); 2) using ECO funding where available; 3) obtaining a local or central Government grant. This will initially apply only where there is a new tenancy agreement to a new or existing tenant, with a 'regulatory backstop' coming into effect several years later whereby the regulations will apply to all PRS properties that require an EPC. Further, from April 2016 domestic private landlords will not be able to refuse tenants' requests for consent to install energy efficiency improvements. A number of non-regulatory policies are currently in place, with current evidence suggesting that there is a role for regulation to overcome PRS-specific barriers.

Will the policy be reviewed? It will be reviewed. **If applicable, set review date:** 04 / 2020						
Does implementation go beyond minimum EU requirements?			**N/A**			
Are any of these organisations in scope? If Micros not exempted set out reason in Evidence Base.	**Micro Yes**	**< 20 Yes**	**Small Yes**	**Medium Yes**	**Large Yes**	
What is the CO2 equivalent change in greenhouse gas emissions? (Million tonnes CO2 equivalent)	Traded:6.6		Non-traded:5.0			

I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Signed by the responsible Minister:  Date: 23/01/2015

Summary: Analysis & Evidence **Final Policy Option**

Description: Final policy option. PRS Regulations for the EPC minimum of an 'E' from April 2018, but with a 'regulatory backstop' applying from April 2020 for the domestic PRS and April 2023 for the non-domestic PRS.

From April 2016, landlords in the domestic PRS cannot unreasonably refuse tenant's requests to undertake energy efficiency improvements.

FULL ECONOMIC ASSESSMENT

Price Base Year	PV Base Year	Time Period	Net Benefit (Present Value (PV))		
2013	2014	Years 52	Low: Optional	High: Optional	Best Estimate: £2.0bn

COSTS (£m)	Total Transition (Constant Price)		Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low				
High				
Best Estimate				£2.4bn

Description and scale of key monetised costs by 'main affected groups'

Key monetised costs are those associated with installing the energy efficiency measures (£1.6bn), Green Deal credit re-payments (£0.5bn), the 'hidden' costs associated with installing these measures (£0.2bn), and Green Deal assessment costs (£0.1bn). Smaller costs include understanding the Regulations (£30m) and costs to local authorities and central Government (£40m). Costs to landlords include Green Deal credit repayments during void periods, a proportion of the 'hidden costs' (the majority of which are incurred by the tenants), and Green Deal assessment costs (when not offered for free). The presence of the Green Deal and other funding options will ensure that landlords are not subject to upfront capital costs as a result of the proposed Regulations, and landlords may also be able to pass on some of their costs onto tenants through marginally higher rent charges, depending on local market conditions. The remainder of the costs will be incurred by tenants. However, tenants will be safeguarded by the Golden Rule (that is, the estimated energy savings are expected to be larger than the Green Deal credit repayments) and will benefit from an improved property.

Other key non-monetised costs by 'main affected groups'

There may be costs to DECC in promoting the Regulations, producing guidance for landlords and letting agents, and costs in liaising with local authorities. There may also be some costs to letting agents in advising landlords on compliance with the Regulations; these are expected to be small in relation to the policy as a whole.

BENEFITS (£m)	Total Transition (Constant Price) Years		Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low				
High				
Best Estimate				£4.4bn

Description and scale of key monetised benefits by 'main affected groups'

Key benefits are the reduced energy demand (£3.6bn), the carbon savings (£0.6bn), and the comfort benefits associated with warmer homes (£0.1bn). There are also smaller benefits associated with improvements in air quality (£0.1bn).

For tenants, benefits take the form of lower energy bills, and warmer homes. We have estimated that the health benefits of the policy amounting to around £100m. These have not been included within the main costs and benefits of the policy to avoid possible double counting with comfort benefits. Landlords may benefit from an increase in their property's market value as a result of improvements in the property's energy efficiency. These bill savings and increases in property value are distributional implications of the policy, and so have not been included in the benefits to avoid double counting of the energy saving benefits. The benefits associated with reduced energy demand, fewer carbon emissions, and improved air quality, accrue to wider society.

Other key non-monetised benefits by 'main affected groups'

Likely benefits to landlords that have not been quantified include potentially higher rents and shorter void periods. Moreover, the proposed Regulations are expected to alleviate fuel poverty, and could reduce NHS costs. By lowering energy demand, the Regulations may also reduce reliance on imported fossil fuels, thus increasing the security of energy supply. Finally, Regulations may reduce the costs of delivering ECO. Because of uncertainty in the future specification of ECO beyond March 2017, this benefit has not been included in the policy's cost benefit analysis (CBA) or Equivalent Annual Net Costs to Business (EANCB) calculations.

Key assumptions/sensitivities/risks	Discount rate (%)	3.5 (years 1-30), 3.0 (>30 years)

Key risks to the costs and benefits outlined are around compliance with the proposed Regulations. There is also an assumption that, by 2018, Green Deal finance will be available in the non-domestic sector. The likely costs and benefits will also be affected by (uncertain) future energy prices (these are varied as part of the sensitivity analysis).

BUSINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £m:			In scope of OITO?	Measure qualifies as
Costs: 58.9	Benefits: 153.6	Net: -94.8	Yes	Zero Net Cost

Contents

1. Introduction and description of the problem

1. This final stage Impact Assessment (IA) accompanies the Government consultation response on the secondary legislation for the proposed domestic and non-domestic PRS Regulations, which apply to England and Wales. The domestic and non-domestic Regulations require all applicable properties in the PRS to be improved to a specified minimum standard, subject to meeting a set of criteria. The domestic Regulations also include provisions that will empower tenants to request consent for energy efficiency measures that may not be 'unreasonably refused' by the landlord. This document provides an assessment of the impact of the Regulations.

2. This section includes a background on the PRS. It focuses on the size of the sector, length of tenancy and the number of households in the least energy efficient properties in the PRS in fuel poverty

1.1 Domestic PRS

1.1.1 Scale of the problem

3. There were around 4.2 million domestic PRS properties in England and Wales in 2012, comprising around 18% of the total domestic housing stock. This makes it the second largest form of tenure after owner occupation (which makes up around two thirds of the total housing stock)[1].

4. The average energy efficiency of buildings within the domestic PRS has improved over the last 15 years. The average Standard Assessment Procedure (SAP)[2] rating in the PRS increased from around 40 (an EPC 'E' rating) to just over 55 (an EPC 'D' rating). This improvement over time is partly due to an increase in the sector's size over this period[3], and is shown in Figure 1 below. New properties were responsible for most of the increase in PRS supply, meaning that by 2012 nearly 20% of PRS properties in England were of post-1990 vintage (compared to around 13% for both the owner occupier and social sectors)[4]. Newer properties tend to have higher energy efficiency ratings, due to more stringent building regulations. Many of these new build properties were flats, which tend to have higher EPC ratings due to being generally easier to heat than houses.

5. There remains, however, a stock of older properties in the PRS which have the lowest energy ratings of all domestic properties. The sector has a high proportion of dwellings that were constructed pre-1919 – 33% compared with 19% in the owner occupier sector[5]. Between 1996 and 2012, the number of F and G rated properties in England fell in the private rented sector at a much slower rate than other sectors, reducing by just 50%, compared to around 80% in the owner occupier sector and over 90% for local authority housing[6].

[1] English Housing Survey (EHS) 2012/13 and Statistics from the Welsh Government; the 2011 Census: http://www.ons.gov.uk/ons/rel/census/2011-census/key-statistics-for-local-authorities-in-england-and-wales/stb-2011-census-key-statistics-for-england-and-wales.html#tab---Accommodation-and-tenure suggests similar figures.

[2] SAP is the Government's recommended system for producing a home energy efficiency rating. SAP scores are divided into 7 bands ranging from A-G, and each range has a set amount of 'SAP' points. More details on SAP can be found here: https://www.gov.uk/standard-assessment-procedure. Details of how SAP scores translate into EPC ratings can be found here: http://www.energykey.co.uk/epc.html

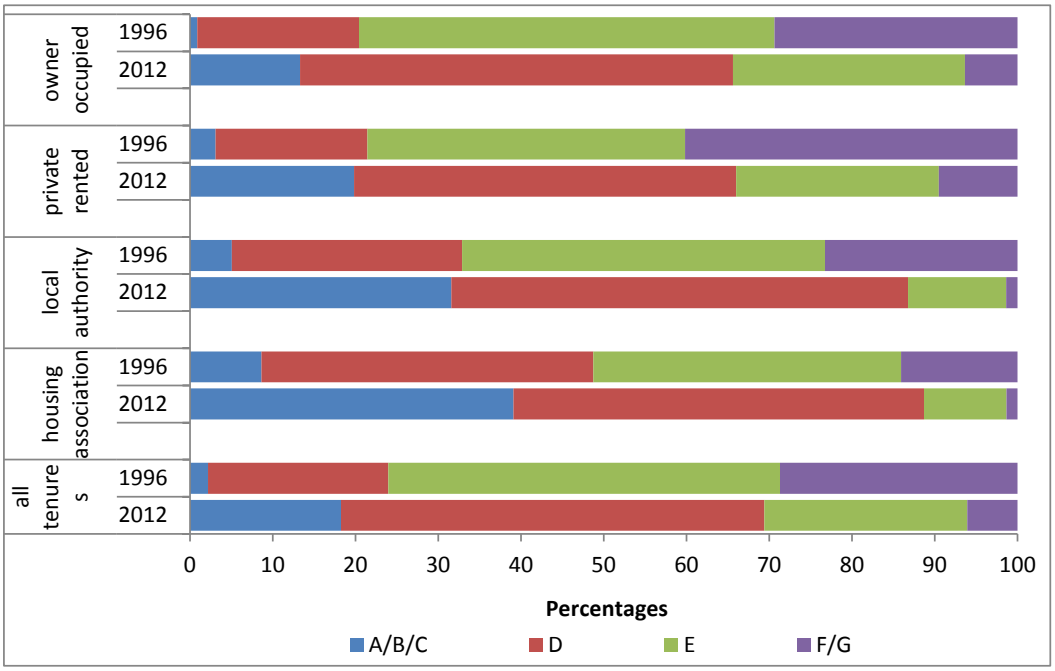
[3] In England, the number of PRS properties increased from around 2 million in 1996 to nearly 4 million 2012. The number of 'owner occupied properties, meanwhile, increased by less than 1 million (from around 13.5 million to around 14.4 million), while social housing decreased by 0.4 million (from 4.2 million to 3.8 million). Source: EHS 2012-13.

[4] EHS 2012-13.

[5] EHS 2012-13. DECC analysis of the survey also shows that 65% of 'F'- and 'G'- rated households in England are of pre-1919 vintage.

[6] Ibid. The decline in the volume of 'F'- and 'G'- rated PRS, owner occupier and local authority properties is not directly comparable with the distribution shown in Figure 1, as the number of properties within each of these tenure types changed between 1996 and 2012.

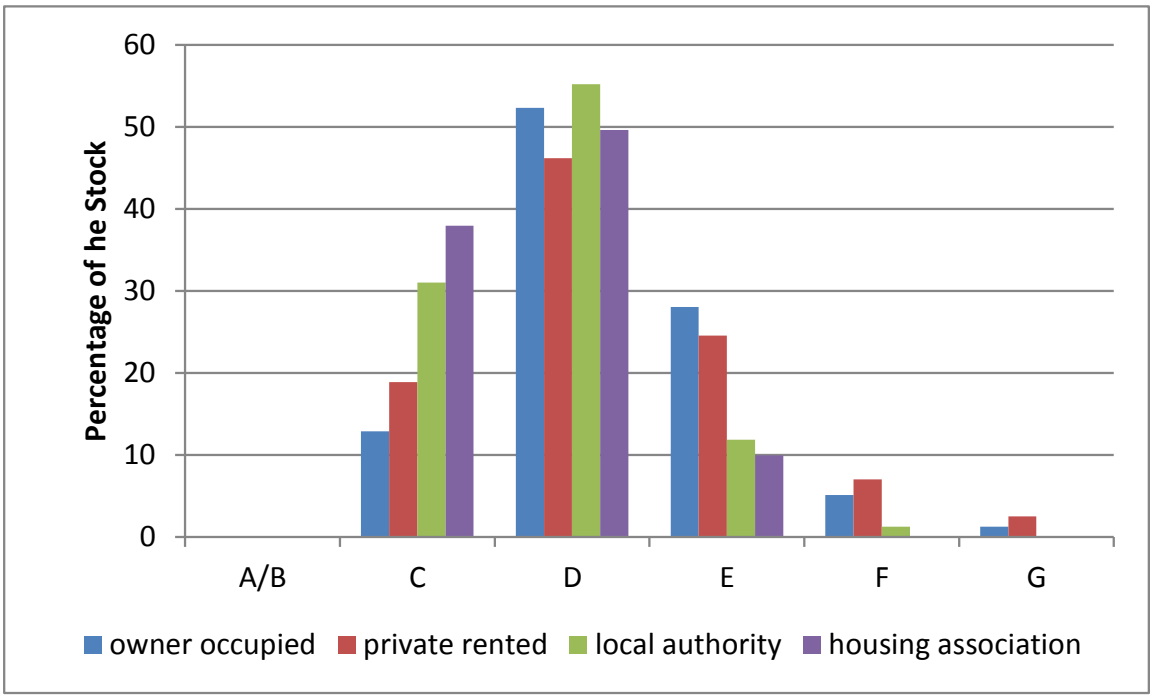
Figure 1: Distribution of EPC Ratings in England by Tenure in 1996 and 2012



Source: English Housing Survey 2012-13

6. The distribution of EPC ratings within the PRS, and a comparison with other tenures, is shown in Figure 2 below. The PRS has the highest percentage of homes with the lowest energy ratings[7].

Figure 2: Distribution of EPC Ratings by Tenure (England) in 2012



Source: EHS 2012-13

7. The insulation of PRS properties tends to lag behind other sectors. In 2012:

- 33% of PRS homes with cavity walls were uninsulated compared with 27% in the owner occupied sector;
- 7% of PRS homes had no loft insulation (LI) compared with 4% in the owner occupied sector; and

[7] Ibid

- 11% of PRS homes had no double glazing compared with 4% in the owner occupied sector[8].

8. PRS properties were also far less likely to benefit from past supplier obligations such as the Carbon Emission Reduction Target (CERT) and Community Energy Saving Programme (CESP). Evidence from the Energy Saving Trust's Home Analytics Database indicates that of all CERT measures recorded (where the tenure was known) 89% were delivered to owner occupied properties, with obligated suppliers under CERT and CESP citing the need to liaise with both the landlord and tenant over the installation of measures as the reason for not targeting the PRS[9].

9. If all properties in England and Wales in the PRS were required to obtain or display an EPC when they are let out or sold, then we estimate there could be around 400,000 domestic PRS properties with an EPC rating of an 'F' or a 'G'[10] in 2012. Not all properties are, however, required to obtain an EPC due to EPC exemptions (see Annex A for further information). With the EPC exemptions, around 3.8m properties across the total domestic PRS stock are required to obtain an EPC, and around 360,000 of these have an EPC rating of an 'F' or 'G'.

1.1.2 Tenancy length in the domestic PRS

10. Short tenancy lengths reduce the tenant's share of the overall gain from energy efficiency improvements and can therefore exacerbate barriers to taking up measures (see Section 2). The domestic PRS is characterised by frequent tenant turnover. Table 1 below shows that around a third of tenants have lived in their current place of residence for under a year. The median length of stay for all tenants is around two years. However, a significant minority of tenants have lived in their current place of residence for much longer than the two years on average, with around one-in-five tenants have lived in their current place of residence for more than five years.[11] Regardless of tenancy length, tenants in the PRS may see less value in investing their time or resources in improving the standard of the property they occupy. The Department's research for the Green Deal found that PRS tenants have a short-term mind-set about the property they rent, and even those who had been in their property for several years, often do not consider where they lived to be their 'property' or even their long term 'home'.[12] While domestic tenants wanted a comfortable place to live, many tenants expressed little sense of ownership or responsibility towards the property.[13]

Table 1 Length of residence in the Domestic Private Rented Sector

	< 1 Year	***1-2 Years***	***2-3 Years***	***3-4 Years***	***5-9 Years***	***10-19 Years***	***20-29 Years***	***> 30 Years***
Private Renters (%)	34.3	20.2	12.4	13.2	10.7	4.6	1.7	2.8

Source: English Housing Survey 2012-13

[8] Ibid

[9] Source: https://www.gov.uk/government/publications/evaluation-of-the-carbon-emissions-reduction-target-and-community-energy-saving-programme

[10] This is based on the number of PRS properties in England and Wales and the percentage of PRS properties in England with an EPC rating of 'F' or 'G'. This makes the assumption that the percentage of PRS properties with an EPC rating of 'F' or 'G' in Wales is the same as that in England.

[11] Length of residence data from the EHS 2012-13 suggests that around 10% of tenants have occupied their current address for 10 years or more, so there is potentially a long tail when it comes to duration of stay. However, it seems likely that tenants in the poorest quality housing will move more frequently than average, so the distribution of tenancy length given in the EHS may overestimate the proportion of the duration of stay for tenants in F and G rated properties.

[12] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/43019/3506-green-deal-consumer-research-prs.pdf

[13] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/43019/3506-green-deal-consumer-research-prs.pdf

1.1.3 Domestic PRS and fuel poverty[14]

11. In a recently published Strategic Framework for Fuel Poverty in England, the Government identified that living in the PRS was a risk factor that independently and significantly increased the likelihood of a household being fuel poor.[15] This is also reflected in the most recent Fuel Poverty National Statistics, which show that the PRS accounted for a significantly disproportionate share of fuel poor households (around a third of all fuel poor households live in the PRS, despite the sector only accounting for around 17% of all households in England).[16]

12. Around 19% of the households in the English PRS are fuel poor[17], while around 35% of all households with an EPC rating of 'G' (and around 23% of households with an EPC rating of 'F') were in fuel poverty in 2012, largely because of the high heating costs associated with energy inefficient housing. Moreover, homes within the PRS are disproportionately likely to fail the thermal comfort criterion for a decent home[18], 15% of households failed the criterion in 2012, compared to 6% in the owner occupier sector, and just 5% in the social housing sector[19].

1.2 Non-domestic PRS

1.2.1 Scale of the problem

13. There are around 1.2 million non-domestic PRS hereditaments[20] in the non-domestic PRS, comprising around 66% (by value)[21] of the non-domestic stock.

14. EPC records from registry for England and Wales[22] show that around 10% of registered non-domestic buildings had an EPC rating of G, a further 8% had an 'F' rating (see the figure below)[23]. This suggests that around one-in-five (or around 0.2 million hereditaments) of the non-domestic PRS stock fall within the lowest energy efficiency bands. There is therefore a large opportunity to drive improvements in the energy efficiency of buildings in the non-domestic sector.

[14] In Wales, a household is defined as being in fuel poverty if they need to spend more than 10% of their income on energy. In July 2013 the Government announced its intention to move away from the current definition of fuel poverty in England, and adopt in its place a new *Low Income, High Costs* indicator (DECC (2013). *Fuel Poverty: Changing the framework for measurement. Government Response*. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/211135/government_response_fuel_poverty_consultation.pdf) Under this new approach, an English household is considered to be fuel poor if: (i) They have required fuel costs that are above typical levels (the national median level); and (ii) Were they to spend that amount, they would be left with a residual income below the official poverty line.

[15] DECC (2013). *Fuel Poverty: A Framework for Future Action*. Available at: https://www.gov.uk/government/publications/fuel-poverty-a-framework-for-future-action

[16] DECC (2014). *Fuel Poverty Detailed Tables* (based on the 2012 English Housing Survey). Available at: https://www.gov.uk/government/statistics/fuel-poverty-detailed-tables-2012

[17] Ibid

[18] Details of what constitutes a decent home can be found within the following DCLG guidance https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/7812/138355.pdf

[19] Source: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/284648/English_Housing_Survey_Headline_Report_2012-13.pdf (see page 14)

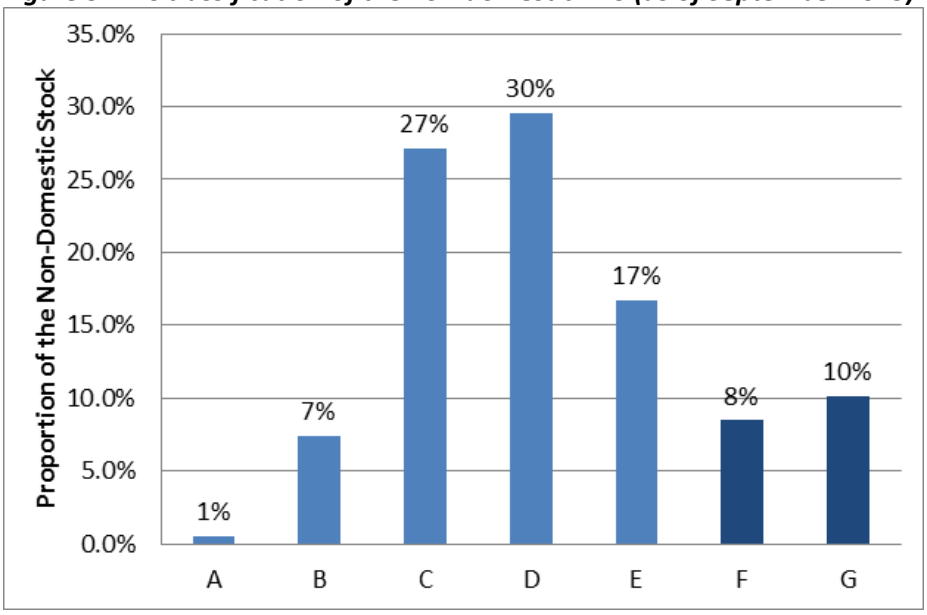
[20] A hereditament is a unit of property space to which business rates are applied.

[21] Measured by property value. Source, The British Property Federation http://www.bpf.org.uk/en/files/reita_files/property_data/BPF_Property_Data_booklet_2013_spreads_web.pdf

[22] Source: DECC analysis of data from Landmark http://www.landmark.co.uk/

[23] The EPC coverage in the non-domestic PRS is around 23%, and we have made the assumption that the distribution of EPC ratings across this subset of the building stock is representative of the overall non domestic building stock.

Figure 3: EPC classification of the non-domestic PRS (as of September 2013)



Source: Landmark; DECC

15. The non-domestic PRS is already covered to some degree by other policies (i.e. the Carbon Reduction Commitment (CRC) and Climate Change Agreements (CCAs)). However, these policies do not cover the entire non-domestic building stock[24]. There are currently no policies incentivising directly improvements in energy efficiency in the non-domestic PRS stock which may result in no action amongst some of the most energy inefficient properties.

1.2.2 Lease length in the non-domestic PRS

16. Details of the average lease length of properties within the non-domestic PRS are shown in Table 2 below. Lease length in the non-domestic PRS tends to be longer than the domestic PRS, with the average tenancy being around 4.1 years for small- and medium- sized enterprises (SMEs) and around 5.2 years for large companies[25]. For SMEs, just over one-in-five leases was greater than five years in length, while for large companies nearly one-in-three had a lease length of over five years. Data on length of occupation (i.e. including lease renewals or extensions) is not available.

Table 2 PRS Commercial Property Lease Lengths[26]

	1-5 Years	*6-10 Years*	*11-15 Years*	*16-20 Years*	*>21 Years*	*Average Length*
SMEs (%)	78.3	19.2	2.1	0.2	0.2	4.1 Years
Large Companies (%)	68.6	23	6.8	0.9	0.6	5.2 Years

Source: British Property Federation/ Investment Property Databank

[24] For example, we estimate that 37-40% (or 57-67TWh) of business (non-SME) electricity use is not covered by the CRC or CCA and up to 9% (or 30 TWh) of non-SME other energy use is not covered by the CRC, CCA or EUETS https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/211471/130521_Energy_Audits_IA_v28_clean.pdf.

[25] Source BPF/IPD Annual Lease Review 2012 http://www.bpf.org.uk/en/files/bpf_documents/commercial/BPF_IPD_Annual_Lease_Review_2012.pdf. Lease lengths have been used as a proxy for tenancy length, as there is no data on the length of tenancy.

[26] The latest BPF lease review, published since the consultation stage IA, indicates similar average lease lengths. However, this update has not been presented here, as it does not allow us to break down lease length by time period, as presented above.

1.3 Summary

17. Although improvements have been made to the energy efficiency of the PRS stock, there remains a sizeable stock of properties where the uptake of energy efficiency measures has been low. There are an estimated 0.4 million and 0.2 million properties in the domestic and non-domestic PRS respectively that are required to have an EPC, and where the EPC rating is below an 'E'. Living in the domestic PRS has also been identified as a factor that increases the likelihood of a household being fuel poor.

2. Rationale for Government Intervention

2.1 Barriers to uptake of energy efficiency improvements in the domestic and non-domestic PRS

18. This subsection outlines the rationale for intervention in both the domestic and non-domestic PRS.

2.1.1 Misaligned incentives

19. For properties in the PRS, the costs of installing energy efficiency measures traditionally fall to landlords, and the benefits of lower energy use and bills and a warmer property usually fall to tenants. In principle, in a well-functioning market, rent levels should fully reflect differences in a property's energy efficiency thus overcoming this split incentive issue. However, the presence of other market failures, such as imperfect information on the costs and benefits associated with energy efficiency measures, rents may not fully reflect differences in energy efficiency. This leaves landlords with little incentive to make energy efficiency improvements.

20. The Green Deal will partially overcome these market failures, as tenants rather than landlords pay for the energy efficiency improvements (through Green Deal credit repayments) and benefit directly from lower fuel bills (see Annex D for further details on the Green Deal and other funding mechanisms available). However, where there are short tenancies, the benefits from installing energy efficiency measures will be spread across several tenancies (which is exacerbated by high tenant turnover in the sector), and making tenants less likely to be interested in improvements, particularly if they involve hidden costs to the tenant. Further action is, therefore, needed in the PRS to overcome the incentive problem.

2.1.2 Imperfect information

21. When individuals cannot or do not accurately assess the costs and benefits to themselves, this can lead to suboptimal choices. This can arise due to inaccurate or incomplete information, or where the information is uncertain or misunderstood. Within the energy efficiency market the uptake of measures may be hampered by imperfect information on the benefits of action, lack of trusted information for consumers (including businesses), and/or inadequate access to, or understanding of, information on energy efficiency measures available to them[27].

2.1.3 Landlord inertia

22. The Carbon Trust's 2009 'Building the Future Today'[28] found that a large number of barriers and complexities combine in the non-domestic property sector to create a 'circle of inertia'. Further, a Harris interactive poll of private landlords in 2009[29] revealed that:

    (i) 54% of private landlords who think their properties have un-insulated lofts are not considering insulating them in the future; and

    (ii) 64% of private landlords who think they have un-insulated wall cavities in their rental properties are not considering filling them in the future.

23. Bounded rationality may account for some of the inertia. However, psychological and cultural factors, such as aversion to a perceived debt and social norms, may also be contributing factors[30].

[27] Royal Institute for Chartered Surveyors (2010) "Energy Efficiency and Value Project" noted a lack of consistent or easy to access information on energy efficiency and found that this influenced a low level of demand for energy efficiency measures. DECC's consumer research (2011) shows that after requests for lower heating costs, having access to convincing information about benefits and information from a trusted source are the main reasons given for what would encourage people to make their homes more energy efficient.

[28] http://www.carbontrust.com/media/77252/ctc765_building_the_future__today.pdf

29 Private Landlords Research" Harris Interactive (February 2009) for EST and EEPH; EST research

24. The combination of an energy inefficient housing stock, split landlord-tenant incentive, and largely short term views of tenants to their property means that this part of the housing stock is likely to be hardest to improve. Furthermore, tenants in the PRS who may be willing to take action have limited rights as to the fabric and fixed services in the property that they rent. They may also face further barriers to instigating improvements compared to owner occupiers, as they must seek and obtain landlord consent. The Department's research on the Green Deal found that tenants seemed to be unwilling to ask their landlord for general improvements unless they were remedial (except possibly at the start of the tenancy)[31].

2.2 Equity in the domestic PRS Sector

24. The following are additional rationale for intervention that applies to the domestic PRS.

2.2.1 Address the drivers of fuel poverty

25. The barriers to improving standards in the least energy efficient properties in the PRS, outlined in Section 2.1, are compounded by equity concerns relating to the disproportionate share of F or G-rated PRS homes that are lived in by households on low incomes. Households on lower incomes typically face the greatest trade-offs between using their constrained resources to adequately heat their homes and spending on other basic essentials. Those that face the overlapping challenges of living on a low income and facing high energy costs are defined as living in fuel poverty. Living in the PRS has been shown to be an independent and significant risk factor of being in fuel poverty, and this is manifested in that the PRS accounts for around 33% of all fuel poor households compared to around 18% of all households.

26. More details can be found in Annex B

2.2.2 Improving tenant health

27. Living at low temperatures poses a risk to health, with a range of negative morbidity and mortality impacts associated with exposure to the cold. The Marmot Review Team report on cold homes and health[32] and the Hills Fuel Poverty Review[33] set out the strong body of evidence linking low temperatures to these poor health outcomes – in particular the cardiovascular and respiratory illnesses that drive the number of excess winter deaths each year. Poor energy efficiency standards, and high energy costs driven by poor energy efficiency, have been shown to be robustly linked to lower indoor temperatures (see Annex B), and households in the PRS facing the barriers to upgrading their energy efficiency (outlined in Section 2.1) therefore risk being 'locked in' to low temperatures and the subsequent negative health outcomes. Improving the energy efficiency of homes has been demonstrated to improve indoor temperatures significantly, with the implication of reduced health risks as a consequence (see Annex B for more details).

[30] Cabinet Office and Institute of Government (2010) "MINDSPACE influencing behaviour through public policy", cites a range of studies that describe situations where people tend to stick to default behaviours, adhere to "norms" of behaviour and respond differently to information that comes from different sources.

[31] ibid

[32] Marmot Review Team (2011). *The Health Impacts of Cold Homes and Fuel Poverty*. Available at: http://www.instituteofhealthequity.org/projects/the-health-impacts-of-cold-homes-and-fuel-poverty

[33] Hills (2011). *Fuel Poverty: The Problem and Its Measurement*. Available at: http://sticerd.lse.ac.uk/dps/case/cr/CASEreport69_Executive_Summary.pdf

3. Policy Objectives

3.1 Main policy objectives

28. The Government seeks to improve the energy efficiency of buildings in the PRS in a cost effective manner, and encourage continued cost-effective investment in energy efficiency over time. To help achieve this the Government included within the Energy Act 2011 a duty on the Secretary of State to bring into effect regulations for England and Wales so that by 1 April 2016 domestic private tenants can request consent to energy efficiency improvements that may not unreasonably be refused by their landlord, and by 1 April 2018 domestic and non-domestic privately rented property must meet a prescribed minimum energy efficiency standard (as determined by a property's EPC), to be lettable. In tackling the energy efficiency of the PRS, the Government will help address one of the root causes of fuel poverty, and contribute towards the first milestone of the new fuel poverty target as well as helping the UK to meet its legally binding carbon targets.

29. The policy design also ensures:

- **No upfront costs to landlords.** In this context, upfront costs mean the capital costs of installing energy efficiency measures required to improve the EPC rating of the property. Enabling landlords to take out Green Deal finance (provided the measures meet the Golden Rule) which may be subsidised by ECO[34] funding or local authority grants means landlords will not be required to pay upfront for the costs of energy efficiency improvements.

- **No net costs to landlords**. Landlords should not incur net costs for installing improvements required under the Regulations for the lifetime of the improvements. The overall net impact of the Regulations depends in part on how costs and benefits are distributed between landlords, tenants, and other parties, and the extent to which the benefits of energy efficiency are reflected in rent and property values.

3.2 Broader policy objectives

30. Improving the energy efficiency of properties should increase the demand for energy efficient measures and reduce demand for energy. These outcomes will help the Government to achieve its broader objectives which include to:

- **Support economic growth, jobs in the green construction industry and investment in domestic dwellings and commercial buildings**. Increased demand for energy efficiency measures is likely to support productivity growth and jobs within the green construction industry and the wider supply chain for energy efficiency measures. Greater competition within these markets may also spur innovation, lowering the end costs of installing measures to households, and help sustain jobs. There could be benefits in the wider macro-economy associated with the productivity gains in more energy-efficient businesses and an indirect consumption 'rebound effect' associated with increases in real incomes as a result of fuel bill saving.

- **Increase the security of the UK's energy supply** (which also decreases peak demand and price volatility).

31. See Annex B for more information on policy objectives.

[34] More details on the Energy Company Obligation (ECO) can be found in Annex D.

4. Policy Options

4.1 Rationale for regulation

32. The Regulations to be brought into effect under these provisions are needed to overcome the split incentive and inertia problems that are exacerbated by high tenant turnover in the PRS - particularly in the domestic sector. Short tenancy lengths mean that tenants would not benefit fully from investments in energy efficiency. Under the Regulations, it is the landlord rather than tenant that is required to initiate the energy efficiency improvement. This means that short tenancy lengths would not act as a barrier to the uptake of energy efficiency improvements. Landlords would also not have to cover the cost of measures under this arrangement as the tenants (who would benefit from lower fuel bills) would generally fund the energy efficiency improvements, for example, through Green Deal credit repayments attached to their fuel bills, or through ECO, local or national grants. All the funding options ensure there are no involuntary upfront costs to landlords for the energy efficiency measures.

33. The Regulations will overcome information barriers through the Green Deal and ECO. The Green Deal requires advisors and installers to be accredited and they provide trusted sources of information on energy efficiency measures. The Green Deal also provides a flexible market framework for facilitating branded suppliers with existing customer relationships to come forward and market their services, as well as a financing option.

4.2 Alternatives to regulation

34. Various approaches have been tried in the past to improve the energy efficiency of the PRS. These include voluntary approaches, information services, tax breaks for landlords, and subsidies for the installation of energy efficiency measures. Details of past proposals are discussed in the Impact Assessment for the primary legislation for the PRS Regulations[35]. These approaches have been unsuccessful in overcoming the market barriers described above, meaning insulation levels in the PRS continue to trail other tenures (as discussed in Section 1).

4.3 The do-nothing option

35. This option assesses the situation in the absence of intervention. This is the baseline for comparison with the final policy design outlined below. In the 'do nothing' option, the barriers and market failures identified earlier will remain and will prevent the Government from achieving its main objective of improving the energy efficiency of buildings in the PRS.

4.4 Final Policy Option

36. The final policy option is the preferred option having considered and discounted the do nothing option and alternative options outlined in the consultation stage IA. The final policy option takes account of responses from the consultation and includes regulations for the domestic PRS for tenants' right to consent for improvements, and minimum energy efficiency standards within the domestic and non-domestic PRS, as required under the Energy Act 2011. These are to be implemented as follows:

37. **Component (1)** From 1st April 2016, landlords of a domestic property may not unreasonably refuse requests from their tenants for consent to energy efficiency improvements, where financial support is available that ensures no upfront costs to landlords for the measures, such as the Green Deal, the ECO, tenant's own funds, or national or local authority grants. This component applies to all properties in scope, regardless of their EPC level, or whether they have an EPC.

[35] These are contained within the Energy Act (2011) Impact Assessment https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48196/3223-EA2011-green-deal-impact-assessment.pdf (see section D).

38. **Component (2)** From 1st April 2018, all new lettings or tenancy renews of applicable private rented properties in the domestic and non-domestic sectors should be brought up to a minimum EPC rating of an 'E' if this can be achieved with no upfront costs.

39. The intention is that landlords would fulfil this requirement if the property had either reached an 'E' threshold or carried out the maximum package of measures that can be funded under the Green Deal, ECO, national or local grants (or a combination of these), even if this does not take them to an 'E' rating.

4.4.1 Scope of the Regulations

40. The Energy Act 2011 places a duty on the Secretary of State to implement the Regulations in England and Wales. It also provides powers to Scotland to implement similar regulations, but their use is for the Scottish Government to determine.

4.4.2 Coverage

41. Exclusions are properties or leases/tenancies that are not affected by the Regulations. The PRS minimum standards Regulations would apply to all rented properties in England and Wales that require an EPC under existing Energy Performance of Buildings (England and Wales) Regulations 2012. Therefore the Minimum Energy Efficiency Standard Regulations would apply to any rented property, let on an eligible tenancy, that:

    i. Has an EPC; and
    ii. Would be required to provide an EPC by the Energy Performance of Buildings (England and Wales) Regulations 2012 when they are sold or let[36] [37].

42. However, the PRS regulations will also apply where a building has an EPC and only part of the building is let (such as an individual room) on a PRS tenancy in scope, even though in this situation an obligation under the Energy Performance of Buildings (England and Wales) Regulations 2012, would not apply.

43. In addition to those buildings excluded from having to provide an EPC on sale or let, the following situations are proposed to be excluded from triggering a PRS regulatory requirement:

    - non-domestic properties on a short flexible lease (less than six 6 months). This exemption ceases to apply where the granting of a lease means that the property will have been occupied by the same tenant more than 12 months; and
    - those on a very long lease, greater than 99 years in length (where a freeholder grants a long lease to a leaseholder, akin to a sale of the property).

    More details on coverage can be found in Annex A.

4.4.3 Regulatory Backstop

44. The final policy option involves a 'soft start' to the minimum energy efficiency standard Regulations. Landlords only have to comply with the minimum energy efficiency standard Regulations after 1st April 2018 upon tenancy renewal, or once a new tenant moves in. As outlined in Section 1, high tenancy turnover, means that the majority of landlords should be able to undertake the required works during a 'void' period[38] before the new tenant moves in, reducing disruption to tenants and capitalising on a natural point in a

[36] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/307556/Improving_the_energy_efficiency_of_our_buildings_-_guide_for_the_marketing__sale_and_let_of_dwellings.pdf

[37] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/50268/A_guide_to_energy_performance_certificates_for_the_construction_sale_and_let_of_non-dwellings.pdf

[38] Time when properties offered for rent remain without tenants. In the domestic PRS, the average void period for a property is around 3 weeks, according to the Association of Residential Letting Agents http://www.arla.co.uk/media/466322/ARLA-PRS-Report-Q4-13.pdf

tenancy cycle when improvement works are normally undertaken. Following strong support from stakeholders, the regulations will also apply on the agreement of a lease to an existing tenant as well. This will capitalise on a natural point in the tenancy cycle where both parties are negotiating tenancy terms, and is an opportune time to consider energy efficiency improvements, minimising disruption.

45. A 'regulatory backstop', however, would apply after 1st April 2020 (for the domestic PRS) or 1st April 2023 (for the non-domestic PRS), by which point all landlords letting 'F' and 'G' EPC rated properties (including those where the sitting tenant has not moved out, or tenancy has not been renewed, since 1st April 2018) must attempt to meet the minimum EPC requirement. The inclusion of the backstop date helps to ensure properties with the same tenant for many years, or long tenancies, are exposed to the Regulations within a reasonable amount of time.

46. The implementation date for the regulatory backstop is based on the discussions and recommendations made by the domestic and non-domestic PRS working groups[39] and the feedback received during the consultation, which showed broad support for this manner of introduction. The backstop dates of 2020 (domestic) and 2023 (non-domestic) were based on the average tenancy length in the domestic and non-domestic PRS (as discussed in more detail in Section 1).

4.4.4 Temporary exemptions

47. A temporary exemption from reaching the minimum standard will be granted in the event that the landlord is unable to undertake energy efficiency improvements with no upfront costs. Similarly, if a tenant does not give consent for the landlord to undertake the energy improvements, a temporary exemption will also apply. See Annex A for more information.

[39] Details and minutes of these meetings can be found on the Government's website https://www.gov.uk/government/policy-advisory-groups/working-group-on-the-domestic-private-rented-sector-prs-regulations (domestic working group); https://www.gov.uk/government/policy-advisory-groups/133 (non-domestic working group).

4.4.5 Alternative payback test for non-domestics PRS

48. For the minimum energy efficiency standard in the non-domestic PRS, stakeholders indicated that an alternative means of demonstrating that reasonable levels of investment in energy efficiency improvements have been made to a property outside the Green Deal's Golden Rule would be welcome. Stakeholders indicated that landlords may decide not to use Green Deal finance, or even a Green Deal Provider. Such landlords may have preferred suppliers, existing contracts with suppliers, and/or access to capital or other preferred sources of financing. The increased specialisation of property management for commercial property makes offering this option more viable than in the domestic sector.

49. To allow such landlords to demonstrate that they have undertaken reasonable steps to install all cost effective energy efficiency measures, the Government intends to offer landlords an alternative test to the Green Deal's Golden Rule: a Fixed Payback test. The alternative test mimics the essential elements from a Green Deal Golden Rule, but in a simplified manner.

50. Landlords will be required to get to an EPC rating of an E, or do everything that is cost-effective. 'Cost-effective' is defined under the alternative test as all improvements that recoup in energy bill savings within 7 years the cost of purchasing and installing the improvements[40]. Landlords would be exempt where they cannot get commercial financing (and therefore where they would not be able to avoid the upfront cost of installing the measures). They would also be exempt if they had a sitting tenant and the tenant refused to pay for the cost of the loan for the time they were in the property. Where the landlord was letting under a new tenancy, the cost of loan would be included in the rental charge (and there would therefore be no exemption).

51. For the purposes of the non-domestic modelling (as outlined in section 5 and Annex F) we assume that 50% of uptake is financed through the non-domestic Green Deal, and 50% of uptake is financed through this alternative payback test[41].

[40] Measures that are cost-effective under the seven year payback for the cost-effectiveness test are those measures where the value of the energy savings over seven years as a result of installing the measure is greater than the cost of purchasing and installing the measure, and any interest payments resulting from borrowing this purchase and installation cost over the seven year period, which are assumed, for the purposes of this calculation, to be charged at the Bank of England base rate prevailing at the time. As set out in Annex Table 12, the shortest lifetime of a non-domestic energy efficiency improvement is 10 years. By setting the payback period at seven years, the mechanism ensures there will be at least three years of additional energy bill savings that will accrue as a benefit, which are not accounted for in the calculation. This ensures that any costs relating to credit used to purchase and install the improvements are counter balanced when the economy is in periods of low interest rates. Including the prevailing Bank of England Base Rate within the calculation provides further protection that when interest rates rise, there will still be a net benefit, and ensures the methodology remains in step with interest rate changes. It should also be noted that by including interest rates in the payback test for the Regulations is more conservative than the payback test under consequential improvements under the Building Regulations, and the payback periods given in EPCs, neither of which feature interest rates in the payback test. More details on what Bank of England Rate was applied can be found in Annex C.

[41] A 50: 50 split was decided because there is no evidence suggesting what proportion of landlords owning non-domestic PRS properties might chose to comply using a Green Deal, and what proportion would use this alternative payback test.

5 Analytical approach

5.1 Modelling approach

52. The aim of the analysis is to:

    (i) Assess the likely uptake of energy efficiency measures in the domestic and non-domestic PRS as a result of the Regulations;
    (ii) Assess the impact of the Regulations on society, through the carbon abatement, the impact on the domestic housing market, improvement in air quality, time costs, and financial impacts;
    (iii) Estimate the distributional impact of the policy, including the distribution of costs borne by landlords and tenants as a result of the Regulations; and
    (iv) Estimate the impact of the Regulations on fuel poverty.

53. The impacts have been appraised according to Green Book[42] and supplementary guidance[43] principles and are presented in discounted real 2013 prices, against a counterfactual of no Regulations (although ECO and Green Deal continue to be available).

54. Measures can only be taken up if all of the following criteria are met:

    (i) The building characteristics are such that the measure would be recommended in an EPC;
    (ii) The measure(s) is (are) cost-effective (i.e. it meets the Green Deal's Golden Rule, taking into account any available ECO or grant/subsidy); and
    (iii) The measure(s) move the property from an 'F' or 'G' standard towards an 'E' standard. This includes installation of measures in properties that do not change EPC band.

55. Each of the models (described below) are used to estimate the impact of the PRS Regulations on energy efficiency uptake in the respective sectors. Uptake is higher in the final policy option relative to the counterfactual as landlords move to comply with the Regulations. Landlords are largely assumed to install measures during 'void periods'[44], except where there is a tenancy renewal, or where the tenant is still resident when the 'regulatory backstop' takes effect[45].

56. The modelling tools and approach in this final stage IA have changed from those used in the consultation stage IA[46]. We have also amended the analysis in light of evidence gained during the consultation period. This section outlines the changes in the analytical approach in this assessment, compared with that in the consultation stage IA. It also outlines the changes to the models used and their input assumptions, and our approach to modelling the final policy package. Background information on the models used in the assessment can be found in Annexes E and F.

[42] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/220541/green_book_complete.pdf
[43] https://www.gov.uk/government/policies/using-evidence-and-analysis-to-inform-energy-and-climate-change-policies/supporting-pages/policy-appraisal
44 Tenant turnover is modelled using the distribution of tenancy durations in Tables 1 and 2 in Section 1.
45 According to the Energy Saving Trust, landlords are much more likely to undertake a whole-house project, using the void period between tenancies to refurbish several rooms in one go. Because they are more often looking at whole-house projects, the budgets they have in mind are also higher. http://www.energysavingtrust.org.uk/Publications2/Corporate/Research-and-insights/Trigger-points-a-convenient-truth
[46] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/335073/Consultation_Stage_Impact_Assessment_for_the_PRS_Regulations.pdf

5.1.1. Changes to the domestic PRS modelling

57. The consultation stage impact assessment used the Domestic EPC PRS Package (DEPP) model to assess the impact of the Regulations on the domestic PRS. DECC has since finished developing the National Household Model (NHM), which we have used to assess the impact of the domestic PRS for this final stage IA.

Background to the NHM

58. The National Household Model (NHM) is a domestic sector model built independently by Centre for Sustainable Energy (CSE)[47] for DECC. It models the impact of policies on the heating and electricity demand of the UK housing stock, simulating their choices and the impact on individual households and their choices over time.

59. The property characteristics are used to determine energy efficiency measures (or combinations of measures) that can be installed in a particular housing type (for example, cavity wall insulation is not applicable to houses with solid walls). Once the type of measures that can be installed in a particular property has been ascertained, the NHM assesses the costs and benefits of installing those measures.

60. The measures that are considered within the NHM are largely those that are recommended on an Energy Performance Certificate (EPC). While measures recommended on an EPC do not represent an exhaustive list of measures that could be installed by a household, they represent the vast majority of the most cost effective measures available.

How the NHM estimates the uptake of energy efficiency measures

61. Estimated uptake of energy efficiency measures within the NHM is modelled by taking the following steps:

    (i) The PRS Regulations drive a proportion of landlords owning domestic PRS properties to consider taking out a Green Deal each year.
    (ii) For each property, every physically possible combination of measures, limited to a maximum of four measure per package, is evaluated.

        a. The total costs and energy savings are calculated, and the NHM tests whether these costs and benefits pass the Golden Rule[48]. If they do not, the package is discarded.
        b. The NHM then finds the package of measures that minimises costs of reaching an 'E' rating.

    (iii) Where measures can be installed under the Golden Rule, but the property cannot reach an 'E', the NHM installs the package of measures that maximises the improvement in energy efficiency of the property whilst still meeting the Golden Rule.

    (iv) If no energy efficiency measures can be made that meet the Golden Rule, no measures are installed, and the landlord is granted a temporary exemption (see Annex A for more details on exemptions and enforcement[49]).

[47] http://www.cse.org.uk/projects/view/1233
[48] The costs within the Golden Rule calculation includes the capital costs of the energy efficiency installation, finance costs (interest payments and set up costs), and assessment costs; the benefits include the estimated bill savings.
[49] Some measures may be installed under the PRS Regulations if ECO or government grant money is available. However, we have not included uptake of measures under ECO to avoid double counting with the ECO IAs. We have also not modelled uptake through Government grants and incentives – as uptake of measures under these are similarly out of scope of this IA.

Advantages of the NHM over DEPP

62. We have switched from using DEPP to the NHM because the latter overcomes a number of inherent limitations with the DEPP. These are summarised below. How DEPP modelled the uptake of measures under the PRS Regulations can be found in Annex E of the consultation stage IA.

Table 3 Previous modelling limitations and improvements for the Final Stage IA

Limitations of DEPP	Impact	How the NHM addresses this limitation
It could not estimate the impact of the tenants' rights.	Key part of policy not modelled.	Unlike DEPP, the housing stock underpinning the NHM is not limited to F and G rated properties – thus allowing us to estimate the impact of the tenants' rights.
The model is static.	Does not account for changes in fuel prices over time.	The NHM is a dynamic model that accounts changes in fuel prices over time.
Inability to reinstall energy efficiency measures once they reach the end of their lifetime.	The need for landlords to reinstall short-term measures (light bulbs/double-glazing) is not modelled.	The NHM re-installs measures once they expire. Treatment of re-installed energy efficiency measures that expire after the end of the appraisal period can be found below (as there is consistent treatment of measures expiring after the appraisal period in both the domestic and non-domestic models).
Constraints on when measures can be installed.	DEPP did not model after 2022, which corresponds to the assumed end of ECO in GDHM.	The NHM permits us to install measures after 2022.

5.1.2. Changes to the Non-Domestic PRS Model

63. The non-domestic PRS impact analysis within this final stage IA has been undertaken using the non-domestic PRS model. The model used to assess the impact of the policy remains largely unchanged from that used in the consultation stage IA. However, since the publication of the consultation stage IA, we have refined the model, addressing some of the modelling limitations we identified within the consultation stage IA.

64. The most significant limitation of the non-domestic model used in the consultation stage IA is that it did not consider the re-installation of measures. This meant that, once installed, measures were assumed to deliver constant energy savings for an assumed period (the measure's lifetime), after which the measure was assumed to expire and the energy savings would fall to zero. We felt that this may understate the costs and benefits of the policy – as once measures expire, the energy and (therefore bill savings) from making the energy efficiency improvements under the PRS Regulations are no longer realised. Failure to account for re-installation of measures also means that we were understating the costs of replacing measures when they break (for example light bulbs) or account for any maintenance work that may be required on larger energy efficiency measures – such as cavity wall insulation[5051].

[50] For larger measures, measures do not break as such, so modelling of the reinstallation of measures in this way acts as a proxy for the costs of maintenance work undertaken on the energy efficiency measures that were installed to comply with the Regulations. As a result, we do not assume that landlords re-installing measures in their properties undertake another Green Deal Assessment (although we do assume that all other costs are re-incurred each time measures are installed).

[51] As we are also uncertain about the future cost of finance when re-installing the packages of measures, we have not included the associated costs of taking out a Green Deal loan compared to another loan option when we estimate the costs and benefits of re-installing measures.

65. The modelling limitation also implies that the treated property's energy efficiency essentially reverted back to its pre-treatment energy efficiency rating. In reality, we would expect that measures installed to be maintained or replaced in order to continue complying with the Regulations, thus ensuring that energy savings persist over a longer time horizon than the measure's assumed lifetime, and that the costs of replacing or maintaining the energy efficiency measures installed are also captured.

66. We have addressed this issue for the final stage IA. The Non-Domestic PRS Model now re-installs measures by taking the following steps:

(i) The initial uptake of measures is modelled in the same way as described in the consultation impact assessment (see or Annex F for more information).
(ii) For the re-installation of measures, we need to account for the fact that some packages of measures will contain measures with different assumed lifetimes (for example, light bulbs in the non-domestic PRS have an assumed lifetime of 5 years, compared to 42 years for loft and cavity wall insulation), meaning the need to split up packages of measures and re-install them separately when each reaches the point of expiration. This is to ensure that long-lived measures are not installed too frequently, and that short-lived measures are not installed too infrequently. This approach assumes that if a package of measures passes the Golden Rule, the measures individually should do so, too[52].

5.2 Improvements to modelling specific policy components

67. Some facets of the policy were not appraised within the consultation stage IA as they were not sufficiently well developed at the consultation stage. How they have been modelled in the final IA is outlined below.

Modelling the tenants' rights

68. The tenants' rights component of the Regulations, which will come into force from April 2016, state that domestic landlords cannot unreasonably refuse tenant's requests to consent to energy efficiency improvements. Under the Rights, tenants would be able to request consent to improvements that can be funded without upfront cost to landlords.

69. As the Department's research for the Green Deal has shown[53], many tenants have limited attachment to their property and do not consider it their long term home, and would not ordinarily make requests for improvements. However through the availability of Green Deal finance, ECO and wider incentives announced as part of the Autumn Statement 2013[54] to be made available until 2017, tenants will have a range of new ways to pay for energy efficiency improvements.

70. This component of the Regulations has been modelled using the National Household Model in the following manner:

(i) The domestic PRS stock represents the maximum number of properties that could be affected by this component of the Regulations (the potential stock);
(ii) In each year, a proportion of tenants in this potential stock request energy efficiency works and the landlord agrees to the works;
(iii) The NHM then tests whether the requested works pass the Golden Rule. Tenants requesting the works are assumed to maximise their bill savings from installing energy efficiency measures (that is, they

[52] The Golden Rule is assessed over a period of 15 years. If some components of the calculation do not meet the Golden Rule on their own, but do as part of a package, then it is assumed their re-installation will still meet the Golden Rule. This is because the same package of measures is still in situ and delivering the original savings that met the Golden Rule's cost effectiveness test
[53] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/43019/3506-green-deal-consumer-research-prs.pdf
[54] https://www.gov.uk/government/news/govt-action-to-help-hardworking-people-with-energy-bills

maximise the difference between their expected bill savings from installing energy efficiency measures, and the cost of installing these measures).

(iv) Where the property's Green Deal assessment passes the Golden Rule, the measures that maximise the bill savings to the tenant are installed.

71. Uptake of measures under this component of the policy is expected to be small; data from the English Housing Survey, for example, suggests that just 3.4% of tenants[55] have seen their EPC and intend to act on its recommendation. Of these, only a fraction will have the works refused by the landlord (only instances where the tenant makes a request that would, in the absence of the Regulations, be refused by a landlord are considered additional costs and benefits of the policy).

72. We assume that only where a tenant is expected to be in a property for more than five years would they consider the installing the measures (as outlined in Sections 1 and 2, tenancy turnover prevents the uptake of measures within the PRS), particularly because, as outlined in Section 2, short tenancy lengths tend to be one of the impediments to energy efficiency improvements within the PRS. Based on estimated uptake outlined in the consultation stage IA, we estimated that cumulative uptake of measures is assumed to occur in around 1% of the entire domestic PRS stock[56].

5.3. Appraisal period

73. The policy is appraised over the period 2014 to 2065, an appraisal period of 52 years.

74. Under the minimum energy efficiency standard component of the Regulations, uptake of measures is assumed to occur until 2023 when the regulatory backstop within the non-domestic sector comes into force. By this point, all landlords that need to act under the PRS Regulations (as outlined in the proposed secondary legislation) will have done so.

75. The longest lifetime of an energy efficiency measure is assumed to be 42 years (such as cavity and loft insulation). To capture all of the energy saving benefits from these longest lifetime measures installed in 2023 (when the regulatory backstop within the non-domestic sector comes into force) the appraisal period would need to go up to 2065 leading to the assumed appraisal period of 52 years (between 2014 and 2065). This approach of ensuring that the benefits are captured over the full lifetime of the measures is in line with Green Book Guidance.[57]

76. A shorter appraisal period would exclude some of the benefits associated with measures the first time they are installed (that is, ignoring the re-installation of measures) from the impact analysis. Costs are generally incurred earlier than the full lifetime of the benefits of measures, so a shorter appraisal period would lead to be unequal treatment of costs and benefits for the longer lifetime measures distorting results and reducing the potential estimated benefits of the policy. A longer appraisal period than 52 years, meanwhile, will only capture the costs and benefits of measures that are re-installed[58]. Some re-installed measures will not have expired by 2065, only the costs and benefits which accrue up to 2065 are captured in the IA[59].

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[55] Source https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/211324/EHS_HOMES_REPORT_2011.pdf (English housing survey 2011: homes report)

[56] More detail on how we arrived at this 1% figure can be found in section 8.6 of the consultation stage impact assessment

[57] Paragraph 5.10 of the Green Book https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/220541/green_book_complete.pdf states "costs and benefits considered should normally be extended to cover the period of the useful lifetime of the assets encompassed by the options under consideration".

[58] In any case, the costs and benefits of measures installed after 2065 are likely to be extremely small due to discounting.

[59] So for example, if the measure has a lifetime of 42 years and had been installed for 21 years come 2065, only half of the costs and benefits of that measure are included within the NPVs of the policy.

77. The policy is expected to be on-going (subject to reviews). An appraisal period of 52 years seems to be an appropriate cut off point as it will cover the full expected impact of the policy to take all non-excluded PRS properties to the minimum energy efficiency standard of an 'E' as required by the regulations provided this can be achieved with no upfront costs to landlords.

5.4 Improvements to the evidence base

78. This subsection examines the improvements we have been able to make to the evidence base – either as a result of feedback from the consultation or through stakeholder engagement.

Changes to the model input assumptions

79. As part of the transition from the Domestic EPC PRS Policy Package (DEPP) model (used for the consultation stage IA) to the NHM (used in this IA), we have updated some of the model input assumptions. These are discussed below.

Housing stock

80. The National Household Model has an updated assessment of the PRS housing stock. The DEPP model used for the consultation stage IA was calibrated, in part, using the English Housing Survey Conditions Survey 2009. This detailed survey involved over 10,000 household interviews, and around 6,000 properties undergoing a physical inspection by qualified surveyors, allowing for a detailed breakdown of the characteristics of the English housing stock.

81. As outlined in Annex E, the building stock underpinning the NHM is based on the most up-to-date detailed housing survey (the English Housing Conditions Survey 2010), while the Welsh stock has is now informed by the Living in Wales (2008) survey. As these detailed surveys were conducted several years ago (in 2010), we have adjusted the English and Welsh building stock to reflect changes in the volume and technical potential of the building stock since these surveys were undertaken (for example using the English Housing Survey 2012/13, as well as data from the Welsh Government on their building stock).

82. As a result, the National Household Model also breaks down the housing stock into a greater level of granularity, with the NHM containing around 16,500 unique property archetypes (compared to just over 200 contained within DEPP).

83. Updating the housing characteristics and size of the stock using this updated evidence has led to a downward revision in the estimated energy savings that can potentially be achieved within the private rented sector as a result of making energy efficiency improvement in the stock.

Costs and Energy Savings

84. As part of the development of the National Household Model for appraising the PRS Regulations, our assumptions about the energy savings and the costs of energy efficiency measures have been reviewed and, where appropriate, revised.

85. Since the consultation stage impact assessment, the assumed energy savings achieved by installing energy efficiency measures as reported in DEPP have been benchmarked against observed energy savings, as reported in the National Energy Efficiency Data-Framework (NEED)[60]. This means our assumed energy savings now better reflect the energy savings that are being observed in reality.

[60] The National Energy Efficiency Data-Framework (NEED) was set up by DECC to provide a better understanding of energy use and energy efficiency in domestic and non-domestic buildings in Great Britain. The data framework matches gas and electricity consumption data, collected for DECC sub-national energy consumption statistics, with information on energy efficiency measures installed in homes, from the Homes Energy Efficiency Database (HEED). It also includes data about property attributes and household characteristics, obtained from a range of sources.

86. The assumed installation costs of energy efficiency measures have also been reviewed. Evidence garnered through stakeholder engagement since the publication of the consultation stage IA has allowed us to benchmark our cost estimates against the costs assumed by external stakeholders.

87. One significant change to our cost estimates is around the assumed boiler costs. For this final stage IA, we are able to update our assumed boiler costs using observed data garnered from past energy efficiency schemes. The updated costs come in follow form:

    (i) 'Capital costs of heat measures' – this lists the wholesale price of a range of heating equipment that was procured from past energy efficiency schemes between 2011 and 2013. We have used this to estimate a distribution of costs for boilers and storage heaters based on the heat output in kW that they produce

    (ii) 'Delivered installation costs per kW' – this takes the distribution of capital costs, and fits it to observed average delivery costs for those technologies observed under previous Government-sponsored energy efficiency schemes (thereby including things like labour costs).

88. The impact of making these changes is to reduce the net benefits of the domestic component of the policy, compared to the modelling within the consultation stage IA.

Costs to Local Authorities

89. We have received evidence through the consultation evidence on the potential costs to local authorities of policing the PRS Regulations.

90. Assessing the data suggested that some of the costs associated with this consultation response may not be additional. For example, some of the costs were associated with understanding energy performance certificates were not additional costs of to the PRS Regulations, as local authorities should undertake training on understanding EPC as part of their compliance and enforcement of Energy Performance Certificates. The cost burden to local authorities will also be reduced by DECC developing and operating a centralised database for lodging relevant evidence and details of an exemption.

91. The IA has, however, increased the costs to local authorities due to compliance and enforcement of the non-domestic PRS, which is now expected to be within the jurisdiction of local authorities.

92. See Section 8 on the costs to local authorities of the Regulations, and Annex A for more information on how these costs were derived.

Costs to Landlords

93. Stakeholders responding to the consultation felt that there could be higher compliance costs[61] to landlords than we estimated within the consultation stage IA. However, some of the evidence presented would be incurred voluntarily. See Annex A for more information.

[61] For example, responses in the non-domestic PRS consultation indicated that where landlords could not meet the minimum energy efficiency standard within the Golden Rule threshold, they would need to liaise with legal professionals before applying for a temporary exemption. In such instances, the compliance costs to landlords could be higher. However, in many instances, landlords in the non-domestic PRS may have their own legal professionals on which to offer them legal advice; if not, they may periodically seek advice from legal professionals over a wide range of legal matters, meaning that the advice they would need to seek over temporary exemptions to the PRS Regulations would be considered as part of the due diligence process.

6. Counterfactual

6.1 Domestic Counterfactual

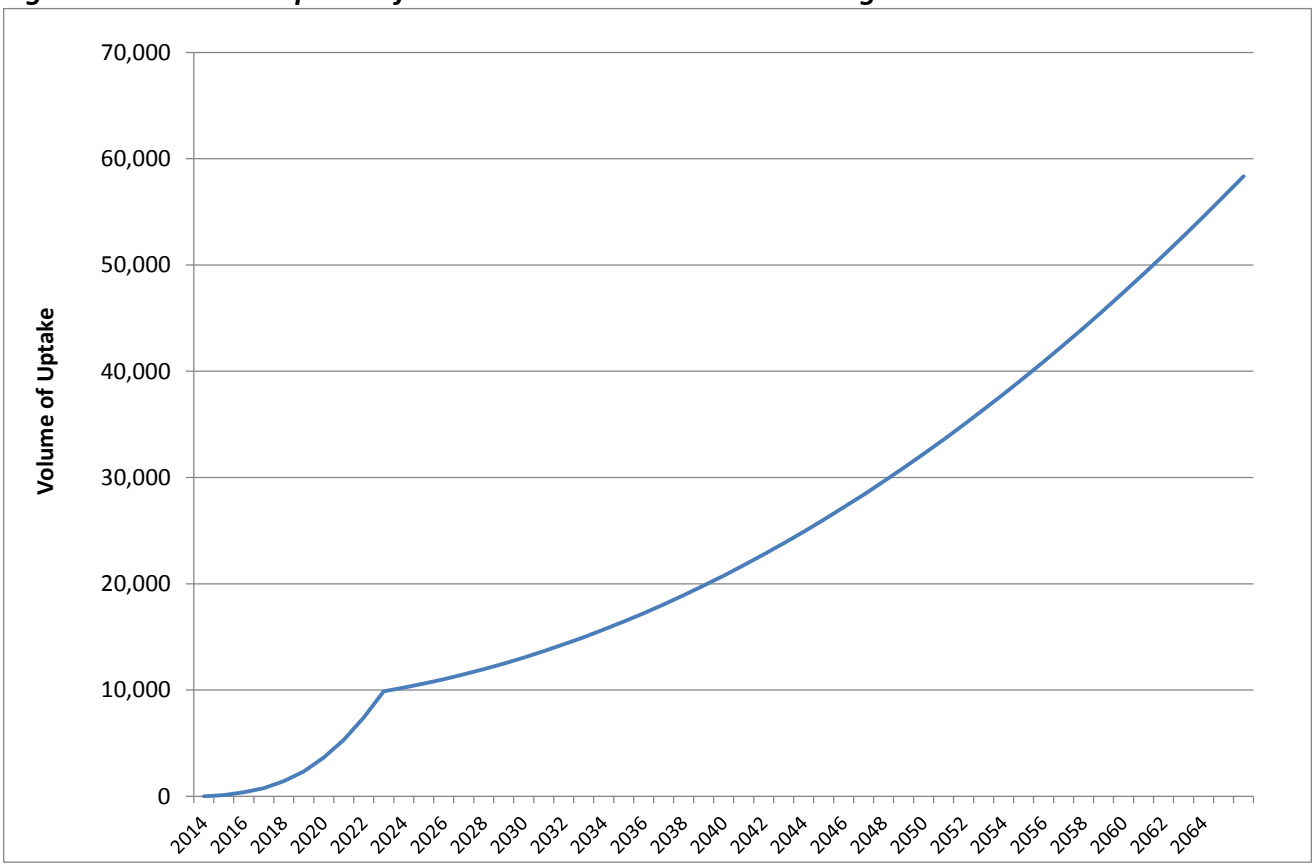
94. Some energy efficiency measures are expected to be taken up in the absence of PRS Regulations, but the rate of improvement has historically been lower than for owner occupied households, as highlighted in Section 1. This trend is expected to continue in the absence of the Regulations.

95. Counterfactual uptake of energy efficiency measures is taken from the Green Deal Household Model (GDHM). This internal DECC model is used to estimate the impact of the Green Deal and ECO on different household types, and provides an estimate of the level of uptake that could be expected under existing policies, i.e. with ECO but excluding the Regulations. The model estimates (for properties due to be covered by the Regulations) the proportion of households that come forward each year to consider installing a measure (either loft insulation, cavity wall insulation or solid wall insulation), the proportion of those houses that decide to invest, and how many of these meet the Golden-Rule, in the absence of the Regulations. As the GDHM considers only the three main insulation measures (set out above) as a gateway into improving a property's energy efficiency, it probably under-estimates the total size of the counterfactual uptake because of those households that will undertake measures in addition to the three measures captured in the GDHM.

96. The domestic model, described in Annex E, takes the counterfactual take-up from the GDHM and nets off the buildings that would have acted in the absence of the Regulations from the total improvement in the building stock, to determine the costs and benefits of the Regulations. The interaction with ECO means that some of the PRS uptake beyond the counterfactual's level has been removed from the policy's costs and benefits to account for displacement of ECO funding. That is, because the Regulations are expected to bring forward alternative ways for energy suppliers to meet their obligations (poorly insulated properties within the PRS), the Regulations may displace ECO funding that would have otherwise subsidised abatement opportunities in other tenures. Where this is the case, the savings are not deemed additional.

97. The counterfactual is shown in Figure 4 below. While the ECO targets have only been set to the period to 31 March 2017, the Government's expectation is that ECO will be a long term, ambitious programme. Therefore, for the purpose of modelling in this IA, ECO is assumed to continue until 2022. Without ECO to partially or fully subsidise energy efficiency improvements within the sector, fewer properties are assumed to make energy efficiency improvements, which means the annual rate of uptake slows after 2022.

Figure 4 Cumulative Uptake of measures in Domestic PRS Buildings under Business as Usual 2014 - 2065



Source: (DECC) Green Deal Household Model

98. As the final stage impact assessment includes the re-installation of measures, we also had to consider that not all re-installed measures should be classified as additional – that is, as one moves further into the appraisal period, the more likely energy efficiency measures would have been installed in the absence of the regulations. The costs and benefits have therefore been reduced to account for this reduction in additionality over time.

6.2 Non-Domestic Counterfactual

99. The 2012 Green Deal/ECO final Impact Assessment presented a business-as-usual take-up profile for a number of energy efficiency measures. This analysis was conducted by Element Energy[62] and modelled the remaining potential and uptake of non-domestic energy efficiency measures. This uptake has been used as a basis for modelling the counterfactual uptake in the non-domestic PRS model. The measures and packages of measures are applied to non-domestic properties according to the most frequently recommended measures to different property types, according to EPC assessment reports. The volume of these packages taken up in the absence of the Regulations is illustrated in Figure 4 for the entire 'F' and 'G' rated stock.

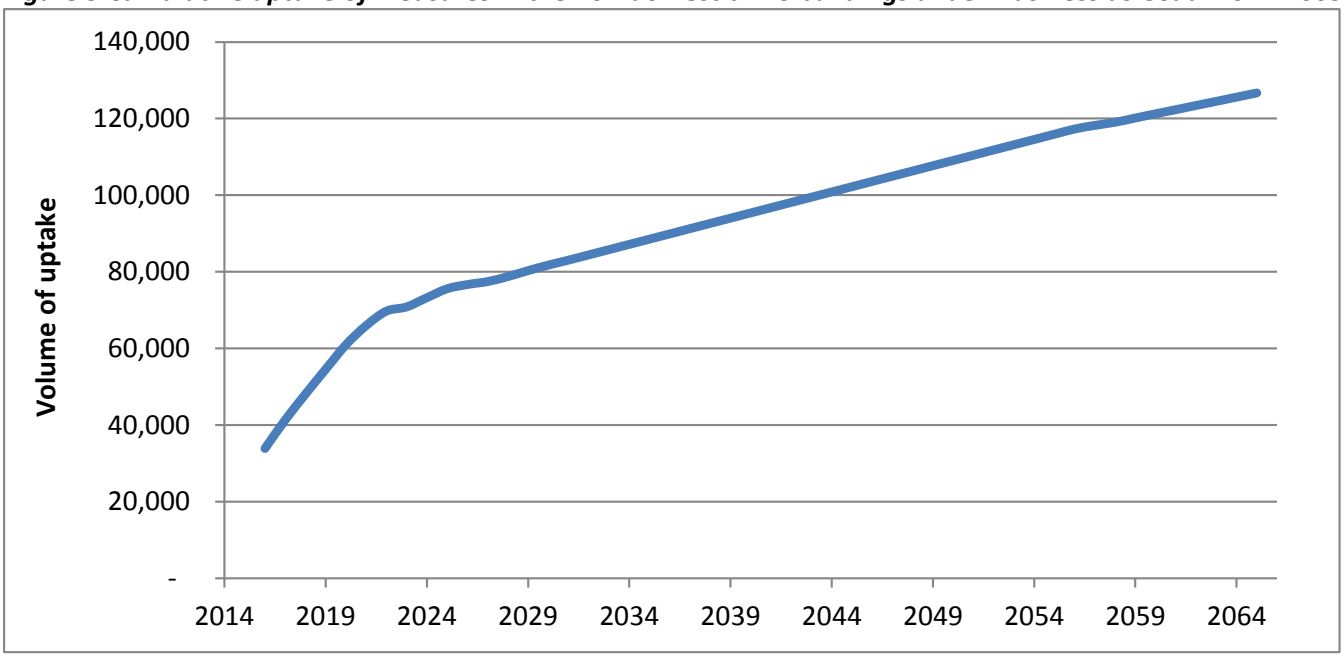
100. Where the BAU profile is not available from the Element Energy report for given measures, the average BAU uptake across all energy efficiency measures was used. Where a package of measures, with different uptake

[62] Element Energy – Uptake of Energy Efficiency in Buildings – 2009. This study reports uptake of measures as a result of the CRC Energy Efficiency Scheme, based on the assessment of these scheme at that time. This means uptake as a result of this scheme will be contained within our non-domestic counterfactual. https://www.gov.uk/government/policies/reducing-demand-for-energy-from-industry-businesses-and-the-public-sector--2/supporting-pages/crc-energy-efficiency-scheme. The legislation for the Energy Savings Opportunity Scheme, meanwhile, had not been laid at the time the modelling for this IA was being finalised. ESOS assessments will highlight the opportunities for companies to reduce their energy bills through cost-effective improvements, which could include upgrading buildings or moving to more energy efficient buildings, and therefore will be complementary to the PRS Regulations. However, it has not been possible to quantify the impact of this interaction

rates of measures occurs, the average of the combined measures' rates was used. Here it is assumed that the measures taken up in the BAU will consist of those deemed to be cost-effective within ten years[63]. Cost effective measures with a longer payback will therefore be excluded. The business as usual uptake is shown in Figure 5 below. It shows a drop off in the rate of uptake under the business as usual in the 2020s, as the most cost effective potential in the non-domestic PRS starts to decline.

101. As with the domestic uptake, the non-domestic counterfactual also reduces the costs and benefits associated with the re-installation of measures to account for the fact that not all of these re-installations should be deemed additional for the purposes of this IA.

Figure 5 Cumulative uptake of measures in the non-domestic PRS buildings under Business as Usual 2014-2065



Source: (DECC) Non Domestic PRS Model

[63] Green Deal loans within the non-domestic PRS have been capped at 10 years as a modelling simplification, reflecting the fact that many measures within the non-domestic PRS lifetime of 10 years or less.

7. Categories of Costs and Benefits

7.1 Summary of key costs and benefits

102. This section outlines the key additional costs and benefits that are expected to accrue to landlords, tenants, local authorities and wider society due to the Regulations. Table 4 below provides a summary. The key assumptions used to measure and quantify the costs and benefits are also discussed.

Table 4: Summary of key costs and benefits

	Costs	Benefits
Landlords	• Installation and financing costs (financed through energy bills) (during property void periods) • Assessment costs • Hidden costs • Cost of understanding Regulations and compliance costs	• Energy bill savings (during void periods) • Potential increase in property values • Increase in tenant satisfaction and reduced void periods (not monetised) • Reduction in long-term property maintenance costs (not monetised) • Reduction in letting costs as property will be easier to let (not monetised)
Tenants	• Installation and financing costs (financed through energy bills) • Hidden costs	• Energy bill savings • Comfort taking • Reduction in fuel poverty (not monetised) • Improved health (not monetised)
Letting agents	• Cost of understanding Regulations (not monetised)	
Local authorities	• Administration and enforcement costs	
Society as a whole	• Installation and financing costs • Assessment costs • Hidden costs • Compliance costs • Costs of understanding Regulations for letting agents (not monetised) and landlords • Administration and enforcement costs • Costs related to tenant requests to undertake energy efficiency improvements	• Net energy savings • Increase in security of energy supply (not monetised) • Carbon savings • Air quality improvements • Potential increase in property values (although these are not included in the societal CBA tables, as they are a transfer to landlords) • Increase in tenant satisfaction and reduced void periods (not monetised) • Reduction in long-term property maintenance costs (not monetised) • Reduction in letting costs as property will be easier to let (not monetised) • Reduction in fuel poverty (not monetised) • Improved health (not monetised) • Wider economic benefits e.g. economic growth, jobs in the green construction industry

7.2 Costs

103. **Installation costs.** This is expected to be the largest individual cost of the Regulations[64]. Installing energy efficiency measures involves an up-front cost, associated with buying and physically installing the relevant items. It is estimated that installation costs will range from £30 for hot water tank insulation to £8400 for solid wall insulation. Installations have an average life of 10 years for energy saving light bulbs to 42 years for cavity and loft insulation. When installations come to the end of their life, it is expected that maintenance work or replacement will be made (see Section 5 for further details on re-installations). It is assumed that installation costs are incurred again at that stage.

104. The Regulations only require landlords to install measures if the installation costs can be funded through Green Deal finance. Therefore, where there are costs, they would be borne by the energy bill payer through Green Deal credit repayments. Further, measures need only be installed provided they meet the Golden Rule. ECO subsidies or local authority grants should increase the number of measures that can be installed cost effectively under the Golden Rule for domestic properties.

105. For the purposes of this IA, we do not assume any reductions in the real costs of installations over time. In practice, technological improvements and increased competition may lower the costs of installing energy efficiency measures and therefore lower the costs of the Regulations. We also do not assume the costs to rise over time, either, as it is assumed that the supply chain can meet the additional demand for energy efficiency measures without hitting capacity constraints.

106. **Financing Costs.** Supplementary guidance to the Green Book, 'valuing energy use and greenhouse gas emissions'[65] advises that "the costs of private financing would generally be considered to be a real social cost". This is because financing costs may affect private sector allocation decisions. When capital is tied up in a specific project, alternative profitable use of such capital is ruled out. The cost of capital should reflect the best alternative return on the capital i.e. the opportunity cost, comprising two elements. Firstly, an element that is equal to a risk-free return (the social discount rate). Secondly, a risk premium should be added to express the undiversifiable risk-adjusted opportunity cost of capital i.e. the return foregone in the financial market on an investment with the same presumed risk profile. This approach is in line with the Green Book which supports adjustment of cash flows to account for risk rather than adjustment of the social discount rate. Finance costs have been included in this final stage impact assessment, ensuring consistency with this guidance and with previous related DECC IAs such as the Energy Company Obligations.[66] The inclusion of private financing costs reduces the NPV and represents a prudent approach to avoid overestimating net benefits of the policy. Figures with and without financing costs are presented in section 8). Some elements of the financing costs will be a transfer, for example, profit and taxation. It has not been possible to separate these out due to the lack of data so financing costs are likely to be an overestimate.

107. Green Deal financing costs are met by the energy bill payer – often the tenant - as part of their fuel bill whilst the property is occupied. Financing costs include the interest, and one-off and on-going Green Deal charges attached to any Green Deal credit. The latter two components are real resource costs to cover administrative costs though they may be overestimated due to the inability to strip out transfers such as

[64] One consultation response suggested that in the non-domestic PRS, the largest component of costs was likely to be the rent forgone while the energy efficiency works are undertaken. Landlords are expected to make energy efficiency improvements during void periods or as part of the property's usual maintenance cycle. A study undertaken by Sweett to estimate the potential impact of the Regulations on the non-domestic PRS 'Mapping the impact of the minimum energy efficiency standards for commercial real estate' found that the forgone rent as a result of the making energy efficiency improvements in order to comply with the PRS regulations was likely to be small.
http://www.greenconstructionboard.org/images/stories/Valuation_and_Demand/GCB%20630%20final%20report.pdf

[65] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/360044/2014_Background_Documentation_to_DECC_HMT_Supplementary_Appraisal_Guidance.pdf

[66] For example, the recently-published Energy Company Obligation Analysis of impacts
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/286926/The_Future_of_the_Energy_Company_Obligation_Assessment_of_Impacts.pdf

profit and taxation as outlined above. The interest rate represents the opportunity cost of the finance. We have conservatively assumed that all tenants taking out a loan to cover the installation of energy efficiency measures do so by taking out Green Deal Credit. In reality, landlords may use other financing arrangements, which may have lower borrowing costs than the Green Deal[67]. The interest rate on financing costs are assumed to be 6.96%.

108. As with the installation repayments, they are spread out over the lifetime of the plan. Should the tenant or landlord decide to pay off the Green Deal early, there may be early repayment charges. However, as these are incurred voluntarily, they are not modelled in this IA. In reality landlords may choose to do work at cheaper finance rates and recover costs through other means for instance marginally higher rents.

109. **Assessment Cost.** Landlords within scope of the Regulations will need to carry out an assessment to identify which cost effective energy saving measures they could install to improve the property's energy efficiency and reduce its electricity bill. The landlord may be charged for this assessment. A recent DECC survey showed that around 80% of Green Deal assessments in the domestic sector are currently being provided free of charge[68]. For the purposes of this IA, we have assumed that for those paying for the assessment in full, the assessments are charged at £112.50 in the domestic PRS and £698 in the non-domestic PRS[69]. In addition, landlords are already required to have a valid EPC upon letting the property. The cost of an EPC forms a significant part of the Green Deal assessment, so there is cross subsidisation occurring of an existing regulatory requirement. As a result, the assessment costs are likely to be lower than those assumed in this IA. For re-installation of measures, it is assumed that landlords do not undertake another Green Deal Assessment. As they will be undertaking the same measure as before, an assessment is not expected to be required.

110. **Hidden costs[70].** These are primarily composed of the time taken by owners or tenants to research measures, arrange for installation, prepare the property for installation and any oversight, clean-up or redecoration costs associated with the installation. These costs are expected to be small in the majority of cases. The time spent researching and organising installations and the potential costs of disruption caused by the installation of some measures are the main hidden costs borne by landlords[71].

111. We have assumed that hidden costs represent 10% of the cost of installation and that landlords incur 75% of hidden costs and the tenant incurs the remainder. This is generally lower than the hidden costs of measures assumed in the Green Deal/ECO final Impact Assessment[72]. The rationale for assuming lower hidden costs is as follows.

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[67] To reflect this uncertainty, we have removed the set-up and annual fees associated with loans required for re-installing the measures.

[68] Source: Green Deal Assessment Survey, January 2014. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/271608/Waves_1_2_and_3_plus_wave_1_follow_up_-_full_report__P23_-_24_-_FINAL.pdf

[69] These are the same cost assumptions as used within the ECO/ Green Deal Final IA https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42984/5533-final-stage-impact-assessment-for-the-green-deal-a.pdf . There is also a one off set up charge of £63.The costs of this set up charge are assumed to be repaid through Green Deal loan repayments, with the charge spread across the lifetime of the loan.

[70] See the Ecofys (2009) "The hidden costs and benefits of domestic energy efficiency and carbon saving measures" report for further details. These costs may be overestimates as the existence of Green Deal accredited assessors and installers may reduce research costs, and combining measures with other refurbishment may introduce economies of scale.

[71] In some instances, such as with solid wall insulation, there may also be costs associated with gaining planning permission. This is expected to occur in only a small number of cases, at a cost between £50 – 170 per property http://www.planningportal.gov.uk/uploads/english_fees-feb_2010.pdf

[72] The hidden costs presented in the ECO impact assessments are based on an Ecofys report (Ecofys (2009) "The hidden costs and benefits of domestic energy efficiency and carbon saving measures"). We assume that the components that make up the hidden costs are the same as outlined in this report and the ECO IA, with the only the size of some of the hidden cost components assumed to be lower (for the reasons set out above). This is in line with the report itself, which notes that many components of the hidden costs should be lower during void periods. We welcome views on hidden costs, as well as our assumption that hidden costs will be lower than those assumed in previous ECO IAs.

i. The Green Deal/ ECO final impact assessment was modelled using the Green Deal Household Model[73], which estimates the uptake of the major measures (solid wall, cavity wall and loft insulation). The modelling presented in this IA, however, also includes the uptake of smaller, cheaper measures, such as low energy lighting and draught proofing. The hidden costs associated with such measures are expected to be very small.

ii. Energy efficiency improvements are expected, for the most part, to be carried out during void periods, which will minimise the disruption to the tenant and landlord[74], as well as potentially align the works with a natural point for undertaking property maintenance and improvements. Both of which will reduce the 'disruption cost' component of the hidden costs. Furthermore, making energy efficiency improvements during void periods is likely to remove some components that are classified as hidden costs entirely (for example, the costs associated with liaising with the tenant over making the energy efficiency improvements).

112. **Understanding the Regulations and other compliance costs (landlords):** Landlords will face costs in understanding the Regulations. It is expected that landlord guidance will be issued after the secondary legislation for the Regulations is laid. The cost to landlords is associated with the time they spend reading this guidance. This is assumed to take, on average, one hour for domestic landlords and two hours for non-domestic landlords (see Annex A for further details). Where landlords are unable to undertake energy efficiency improvements that meet the cost-effectiveness test (the Golden Rule or the seven year payback in the non-domestic sector), the landlord would be granted an exemption. Some costs will be incurred in demonstrating the exemptions. These are, however, expected to be small and have not been quantified (see Annex A for further details).

113. **Understanding the Regulations (letting agents).** There may be a small cost to letting agents in understanding the Regulations. This cost is incorporated in the cost to landlords above.

114. **Costs related to tenant requests to undertake energy efficiency improvements.** From April 2016, domestic PRS landlords cannot unreasonably refuse consent to a tenant's request to undertake energy efficiency improvements, so long as this does not result in an upfront cost to the landlord. Where a tenant makes such a request a tenant and landlord may incur costs in liaising over the request. Where the request is refused, the landlord may incur costs in demonstrating that the works have not been unreasonably refused. The landlord and tenant may also face tribunal costs in the event of a dispute. No estimate has been made in this IA of these costs due to the lack of data, for example, on numbers of potential disputes. Nonetheless, we expect that these costs will be small relative to the costs and benefits of the overall policy. Where consent is given, installation costs, finance costs and so on, as outlined above, are included[75].

115. **Administration and enforcement costs**: Local authorities will be required to administer and enforce the PRS Regulations in both the domestic and non-domestic PRS. These costs are expected to be small, as local authorities will already monitor and enforce the requirement to have an EPC. There will therefore only be small additional costs associated with monitoring that these landlords have also complied with the Regulations. Costs to local authorities will largely be in the form of staff costs. Information provided by a small number of local authorities indicates the following potential costs:

- Set up costs including training staff to develop knowledge on the regulations including funding options (e.g. Green Deal and ECO); and information campaigns of new legal duties to landlords
- Advising on the regulations

[73] Details of the Green Deal Household model are outlined in the 2012 ECO Green Deal 'Final' IA https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42984/5533-final-stage-impact-assessment-for-the-green-deal-a.pdf. Subsequent amendments to the model were outlined in the ECO analysis of impacts https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/286926/The_Future_of_the_Energy_Company_Obligation_Assessment_of_Impacts.pdf

[74] The average void period is three weeks, according to the Association of Letting Agents http://www.arla.co.uk/media/466322/ARLA-PRS-Report-Q4-13.pdf. However, for major works, void periods may have to be extended to complete the works, though this is only expected to be the case in a small number of instances.

[75] Details on modelling tenants' rights can be found in Section 5

- Dealing with complaints and referrals as a result of these measures
- Investigating whether or not landlords are compliant
- Collating, reviewing and preparing evidence for cases
- Costs of cases and tribunals (in the case of appeal)

116. Further details on administration and enforcement costs are provided in Annex A.

117. There are a number of uncertainties around the different assumptions. Changes in the costs of installations or the interest rates charged for Green Deal financing could have a large impact on policy costs, although the cost-effectiveness criterion will limit the downside risk to its value for money. Estimates of 'hidden' and other associated costs are not as strongly evidenced as the larger cost categories. As these costs are comparatively small, changes to them should not significantly affect the overall assessment.

7.3 Benefits

118. **Energy savings**. Installation of energy efficiency measures reduces the resources needed to meet demand. This has been monetised in accordance with Green Book supplementary guidance on 'valuing energy use and GHG emissions'[76] [77]. Energy savings mean fewer resources are required to meet energy service demand, which is a benefit to society. This is valued using the long-run variable cost of energy supply.

119. **Air quality improvements and carbon savings.** Improvements in energy efficiency reduce the amount of energy that needs to be used. This reduction improves air quality and reduces carbon emissions[78]. Reductions in carbon emissions help meet the UK's legally binding carbon targets, while improvements in air quality reduce adverse health impacts (including mortality and morbidity), immediate environmental impacts (such as acidification), and long-term environmental impacts (including climate change). The benefits have been calculated in accordance with Green Book supplementary guidance[79].

120. **Comfort taking**. Energy efficiency measures reduce the amount of fuel required to deliver a given level of energy service, meaning that some households will heat their homes to a higher temperature, for a longer period, or heat more rooms in their homes. The benefits of comfort taking are assumed to occur in the domestic sector only[80]. This is valued at retail prices which act as a proxy for willingness to pay for the additional comfort.

121. **Landlord benefits:** There are also a number of benefits (identified by National Landlords Association[81]), which may result from increased uptake of energy efficiency measures that it has not been possible to monetise. These include

i. Increased tenant satisfaction and reduced void periods;
ii. Reduced long term property maintenance costs; and
iii. Making properties easier to let (there are future EU requirements to display energy efficiency ratings, so higher energy efficiency ratings should make properties easier to let).

[76] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/254083/2013_main_appraisal_guidance.pdf
[77] The energy savings delivered by a measure are assumed to stay constant over the lifetime of the measure, and then fall to zero when measures expire.
[78] Carbon savings are divided into those that are traded (i.e. emissions covered by the EU Emissions Trading System) and non-traded (ie, emissions outside of the Emission Trading System). More details System can be found here: http://ec.europa.eu/clima/policies/ets/index_en.htm
[79] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/254083/2013_main_appraisal_guidance.pdf.
[80] Comfort taking is assumed to be 15% of SAP energy savings, after adjusting for in use factors (that is, the difference between theoretical energy savings delivered from energy efficiency measures and those expected once the measures are installed into a household). Further details on in use factors can be found here: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48407/5505-how-the-green-deal-will-reflect-the-insitu-perfor.pdf
[81] http://nlauk.wordpress.com/2010/11/11/landlords-to-be-dealt-a-fair-hand/

122. **Wider benefits.** There are a number of wider benefits that are expected which have not been monetised:

- benefits associated with improved health (additional to the monetised comfort taking benefit);
- reduction in fuel poverty;
- increase in security of supply; and
- wider economic benefits e.g. economic growth, jobs in the green construction industry.

7.3.1 Benefits assessed in distributional analysis

123. Energy savings as a result of installing energy efficiency measures under the Regulations accrue directly to tenants through lower fuel bills. Some of these savings may be passed through to landlords in the form of higher rents and then capitalised into property values.

124. **Bill Savings**: Improving a property's energy efficiency will mean that less energy is required to achieve a given level of energy service demand. Tenants will take some of this benefit through direct bill savings (calculated using the retail price) and some through comfort taking as discussed above. Furthermore some potential bill savings could fund Green Deal credit repayments (as discussed under costs).

125. **Increase in Property Values:** Increasing a property's energy efficiency could increase its market value. In a market exhibiting the features of perfect competition, the market value of a property (its price) will reflect the cost of supplying the marginal property. As the tenant pays the vast majority of the costs of this measure, the marginal cost to landlords will not materially change. However, if the cost of occupying more energy efficient properties is lower (which should be the case even with Green Deal Plan payments offsetting some of the energy bill savings), there is likely to be a shift in demand towards these properties. This demand shift would increase the value of more energy efficient properties, as the market becomes differentiated according to properties' energy occupancy cost.

126. In the rental market, this could result in landlords being able to charge higher rent levels. Data on the impact on rental values is limited so no attempt has been made to estimate this benefit. Information is available, however, on property values as outlined below.

127. Evidence from a large UK hedonic price study[82][83] indicates that energy efficiency improvements increase the market value of buildings[84][85]. This finding is in line with studies found in other countries, and is also suggested by recent evaluation evidence, which suggests that individuals installing energy efficiency measures that it had had a positive impact on their property's value.

128. Evidence from the hedonic price study was use to estimate the potential increase in property value associated with moving to an EPC rating of E in the domestic PRS (see Section 11 for further details). The study presents the percentage increase in property value associated with moving up each EPC band relative to band G. The average EPC rating across the PRS stock is a rating of a D so figures from the study were rebased giving changes in property values relative to a band D[86].

129. The improvement in market value was then reduced to account for the following:

[82] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/207196/20130613_-_Hedonic_Pricing_study_-_DECC_template__2_.pdf

[83] The study has been peer reviewed by academics at Trinity College Dublin. They concluded that the study was "*... a solid piece of research that goes a long way to answering the underlying question of whether energy efficiency is reflecting in housing market values in England*", although there were also some methodological aspects highlighted in the review. DECC is planning to update the study, taking the peer review comments on board.

[84] A literature review of past studies is presented within the hedonic price study (see reference above).

[85] Note that the study does not investigate the relationship between spending on energy efficiency and it how translates into changes in the property's value (that is, it does not show whether £1 spent on energy efficiency improvements leads to more or less than a £1 increase in the property's market value).

[86] See Section 1 for more details.

(i) The hedonic pricing study did not differentiate between owner-occupied and PRS - it applies to all properties bought and sold that met specific criteria. Therefore, while the landlord rents out the property, some of the bill savings are expected to accrue to tenants rather than landlords[87] as the market is unlikely to perfectly reflect the level of energy savings in the rent levels.

(ii) The study does not assume Green Deal Plans are attached to the property's bill. As Green Deal Plan repayments will reduce the net occupancy savings, properties sold with Green Deal Plan attached to their fuel bill are likely to have a lower price premium until the Plan has been fully repaid. General aversion to any credit that may be attached to a property at the point of sale may also reduce any possible increase in property value.

130. The difference in market value between the different EPC bands was then multiplied by the number of buildings seeing this improvement in their EPC due to the Regulations, giving the overall benefit to landlords of the policy. To calculate the time profile of these benefits, it was assumed that the property was sold seven years after the works were carried out[88].

131. International evidence[89] suggests that an increase in property values, as a result of making energy efficiency improvements, might also be expected in the non-domestic PRS. The mechanism through which energy efficiency improvements could translate into possible increases in a building's value is the same as those in the domestic PRS, as described above. We have not monetised the benefit of an increase in property value in the non-domestic PRS, however, as previous UK-based studies have not produced statistically significant increases in property values (although other international studies suggest such an increase may exist). This will result in an underestimate of (indirect pass-through) benefits to non-domestic landlords.

7.4 Key assumptions

132. Table 5 below summarises the key assumptions in the costs and benefits. More details on the underlying assumptions can be found in Annex I

Table 5: Summary of key assumptions

Input	Assumption
Installation costs	£30 (hot water cylinder insulation) - £8400 (solid wall insulation); some measures are modelled based on floor space of the building
Life expectancy of installations	10 years (lighting) – 42 years (cavity and loft insulation)
Finance costs	6.96%
Assessment costs	£112.50 in the domestic PRS; £698 in the non-domestic PRS (based on current market evidence, nearly 80% of these are expected to be offered free of charge to the landlord
Hidden costs	10% of installing cost with 75% borne by landlords and 25% borne by tenants
Understanding the regulations (landlords)	Domestic – an average of one hour at average wage rate Non-domestic – an average of two hours at average wage rate
Increase in property values	Variable –the possible increase in property value depends on the starting EPC rating and energy efficiency improvement achieved.

[87] It may be possible for landlords to capture some of the bill savings by charging higher rents. However, there is no data on the impact of greater energy efficiency on rents, so it has not been possible to quantify the impact.

[88] The English Housing survey 2011-12 shows the average length of residence in the owner occupier sector is 13 years. Using this as a proxy for the length of time a landlord might own a PRS property, and assuming that the landlord was midway through the ownership period when the measure was installed, means the landlord could realise the benefits of the increase in property value around 7 years after the measures are installed.

[89] These are discussed as part of the literature review within DECC's aforementioned energy efficiency hedonic price study.

8. Impact Analysis

8.1 Costs and benefits domestic and non-domestic PRS

8.1.1 Domestic PRS

133. The PRS Regulations create two effects that lead to higher uptake of energy efficiency measures compared to the business as usual. The first is the higher volume of premises to which landlords and tenants consider undertaking investment to improve their EPC. Second, the safeguards within the policy (that there ought not to be net nor upfront costs to landlords, and energy efficiency improvements need only be made where the improvements meet the Green Deal's Golden Rule) will help ensure uptake to the most cost effective measures. Together, they are expected to drive up the level of capital investment beyond the level without the Regulations (presented in the Counterfactual section). Costs are largely incurred by tenants, who pay for the installation and finance costs (apart from in void periods between tenancies), but who are also the main beneficiaries from the energy savings[90] [91] and comfort benefits. Hidden costs and assessment costs are likely to be spread across landlords and tenants. Other benefits, such as air quality, carbon savings, lower NHS costs and larger EU allowance savings, are more evenly spread across society as a whole.

134. The monetised costs and benefits of the Regulations relative to the counterfactual in the domestic PRS are presented in Table 6, below. The impacts presented below exclude the costs and benefits relating to ECO, which is captured as part of the counterfactual, and have therefore been excluded here to avoid double counting[92].

135. Table 6 has been sub-divided to show the individual impact of the tenants' rights, 'F' and 'G' properties moving to 'E'. The far right hand column shows the total costs and benefits of the domestic PRS Regulations; as shown below, each component of the PRS regulations has a positive net present value (NPV), indicating a net benefit to society.

136. Across all components presented, installation costs and Green Deal credit repayments are the largest components of costs, accounting for around 90% of the total. Hidden costs are estimated to be around 10% of the capital cost of all the components of the domestic Regulations[93].

137. The table also shows that energy savings[94] are the largest benefit of the Regulations, comprising around 60% of the total monetised benefits. The lower contribution from energy savings compared to the consultation IA reflects downward revisions to the energy saving potential from the domestic PRS stock.

138. The largest component of the costs and benefits are associated with E rated properties moving to an E rating, reflecting the larger volume of properties that act under this component of the Regulations. The costs

[90] Tenants will benefit from energy savings, and these benefits are valued using DECC's retail price series. The prices in this series are higher than the price series used to derive societal energy savings, which are valued using DECC's long run variable costs of energy supply, as the latter prices strip out fixed costs and transfers. As a result, the energy savings presented in the table under-estimate the value of the benefits to tenants.

[91] The National Household model assumes that 70% of ECO-qualifying measures will benefit from an ECO subsidy, but the carbon savings from these measures are captured by the ECO policy. The model takes the value of ECO's subsidy and applies it to the ECO-qualifying measures to estimate the level of post-ECO subsidy uptake. The final uptake levels, with or without ECO subsidy, are independent of the take-up levels projected in the ECO consultation's analytical annex.

[92] Details of the ECO analysis can be found here: https://www.gov.uk/government/consultations/the-future-of-the-energy-company-obligation

[93] This is lower than the 20% assumption contained within the ECO Green Deal Final IA. This reflects the fact that landlords are likely to undertake the energy efficiency improvements during void periods, and/ or coincide with refurbishment cycles. See Section 7 for more information.

[94] Further details can be found in in the DECC's Green Book Supplementary Guidance https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/254083/2013_main_appraisal_guidance.pdf). As these are energy savings to society, they are not directly comparable with other costs incurred by landlords or tenants presented in the CBA table.

and benefits of the tenants' rights are, by comparison, small – due to the small volume of properties expected to act under this component of the Regulations.

139. There are also costs associated with understanding the Regulations, amounting to £16m. As discussed in section 7, these apply to all domestic PRS properties, and so have not been attributed to a specific component of the costs and benefits (and thus only appear under the final column in the table below); more details on how these costs were derived can be found in Annex A.

140. A further benefit delivered by all the PRS policy options arises from the interaction with the Energy Company Obligation (ECO). As the PRS Regulations increase the number of households undertaking energy efficiency measures, it expands the available pool of households available to install ECO-subsidised measures. This should reduce the overall cost of delivering ECO throughout the country as there will be a greater amount of potential available to obligated parties under ECO. Search costs to obligated energy suppliers should also be lower than without the PRS policy. No estimate has been made of the additional benefit provided by this effect at this stage, although the sensitivities provided in the recent ECO consultation's Assessment of Impacts demonstrate the possible impact of changing households' decision making frequency and search costs[95].

Table 6: Domestic CBA Table (2014-2065), £m, 2013 prices[96]

	Tenants' Rights	F & G to E	Total
Installation Costs	£4	£317	£321
Hidden Costs	£0	£32	£32
Assessment Costs	£1	£10	£11
Finance Costs	£6	£212	£218
Understanding the Regulations			£16
Total Costs	£11	£571	£598
Energy Savings	£7	£389	£396
Comfort Benefits	£3	£137	£140
Air Quality Benefits	£0	£60	£60
Traded Carbon Savings	£0	£25	£25
Non-Traded Carbon Savings	£3	£33	£36
Total Benefits	£12	£644	£657
TOTAL NET Present Value	**£1**	**£73**	**£59**
Total NET Present Value (excluding financing costs)	**£7**	**£285**	**£277**

Source: DECC National Household Model

149. While we have included finance costs within this IA for the reasons outlined in Section 7, the net benefits of the policy in the domestic PRS excluding finance costs are £277m.

8.1.2 Non Domestic PRS

141. Table 7, below, shows the estimated costs and benefits for the non-domestic PRS, broken down as the domestic PRS costs and benefits described above.

95 Source: https://www.gov.uk/government/consultations/the-future-of-the-energy-company-obligation

96 Numbers may not add up exactly due to rounding.

142. As with the domestic PRS, each component of the Regulations shows a net benefit to society over the appraisal period. The largest costs are the installation and finance costs (around 90% of the total costs), while the largest benefits are energy savings (around 80% of the total benefits).

143. While the proportions are similar to the domestic PRS, the absolute value of costs and benefits in the non-domestic PRS are larger; this is due to the higher energy saving potential per building within the non-domestic sector, as well as 70% of the costs and benefits in the domestic PRS being attributed to ECO policy (and therefore excluded from the costs and benefits within this IA). The costs and benefits are also larger than those presented in the consultation stage IA, due to the modelling now accounting for the re-installation of measures.

144. In addition to the costs and benefits of installing energy efficiency measures, there will be some compliance costs to landlords in reading and understanding the regulations; these amount to around £13m in the non-domestic sector. More details on how theses compliance costs and benefits to landlords can be found in Annex A

Table 7: Non-Domestic CBA Table (2014-2065), £m, 2013 prices

	F and G rated properties moving to E
Installation costs	£1,234
Hidden costs	£123
Assessment costs	£88
Green Deal Finance costs	£284
Understanding the Regulations	£13
Total costs (£m)	£1,743
Energy savings (variable element)	£3,223
Air quality benefits	£17
Lifetime non-traded carbon savings	£240
Lifetime EU Allowance savings	£276
Total benefits (£m)	£3,756
Net Present Value (£m)	**£2,013**
Net Present Value excluding finance costs (£m)	**£2,297**

Source: DECC Non-Domestic PRS Model

145. The net benefit of the policy in the non-domestic PRS excluding finance costs would be £2,297.

8.1.3 Costs to local authorities and DECC

146. As outlined in section 7, there will be resource costs to local authorities and DECC as a result of the Regulations. The costs to local authorities have been monetised based on consultation responses (see annex A for more information). The costs to DECC are based on internal estimates on the costs of creating and maintaining a central register for landlords to lodge their temporary exemptions.

147. The costs to DECC and local authorities are presented in Table 8, below.

148. As can be seen from the table, the majority of the costs to local authorities are expected to be around enforcement of the domestic PRS; this is because, while inspecting buildings is likely to cost more per building in the non-domestic PRS (due to the increased complexity of inspecting properties in the non-

domestic sector), the volume of properties in the domestic PRS is greater, with the higher volume of building in the domestic PRS outweighing the higher cost per building in the non-domestic PRS.

149. There are also expected to be resource costs to central government (DECC). These involve the costs of creating a centralised database where landlords can lodge their temporary exemptions (£3.4m), and the staff costs involved in maintaining the database (£0.4m). More details on how these costs were derived can be found in Annex A

Table 8 Domestic Costs to Local Authorities and central Government, £m (£2013 prices)

	Domestic	Non Domestic	Total
Costs to Local Authorities (£m)	**£27**	**£11**	**£38**
Costs to Central Government (£m)			**£4**
Total Costs (£m)			£42

Source: DECC estimates based on consultation responses

8.1.4 Total Costs and Benefits

150. Combining the costs and benefits from the domestic and non-domestic sectors, landlords, local authorities and central Government gives the total estimated monetised impact of the policy, as shown in Table 9 below. The net present value of the non-domestic PRS represents the largest component of the overall net present value of the policy, reflecting the higher cost effective potential within the non-domestic PRS.

Table 9 Aggregate Impact of the PRS Regulations, 2014 – 2065, £m, (2013 prices)

	Domestic PRS	Non Domestic PRS	Total
Installation costs	£321	£1,234	£1,555
Hidden costs	£32	£123	£155
Assessment costs	£11	£88	£99
Green Deal Finance costs	£218	£284	£502
Costs to Local Authorities	£27	£11	£38
Costs to DECC			£4
Understanding the Regulations	£16	£13	£29
Total costs (£m)	£625	£1,753	£2,382
Energy savings (variable element)	£396	£3,223	£3,619
Comfort Benefits	£140		£140
Air quality benefits	£60	£17	£77
Lifetime non-traded carbon savings	£25	£240	£265
Lifetime EU Allowance savings	£36	£276	£312
Total benefits (£m)	£657	£3,756	£4,413
Net Present Value (£m)	**£32**	**£2,003**	**£2,031**
Net Present Value Excluding Finance Costs (£m)	**£250**	**£2,287**	**£2,533**

Source: DECC Non-Domestic PRS Model and DECC National Household Model

151. The total net benefit of the policy across both the domestic and non-domestic PRS excluding finance costs are £2,533m.

8.2 Reduction in 'F' and 'G' Rated Building Stock

8.2.1 Domestic Sector

152. The table below shows the improvement in the domestic PRS stock (less exclusions), based on their EPC rating at the end of the appraisal period.

153. The table breaks down the EPC improvements based on the starting EPC rating of the stock that can:

i. make the EPC rating of 'E';
ii make some improvement to their energy efficiency (although not to 'E'); and
iii those that cannot make any improvement

154. These improvements must be made within the Golden Rule threshold.

155. The table below shows that around 73% of domestic F and G rated properties can make the E standard, while a further 10% can make some improvement to their energy efficiency (though not to E), while the remaining 17% could not make improvements within the Golden Rule threshold.

156. Our estimates may understate the number of properties that increase their energy efficiency, as real reductions in the cost of energy efficiency measures, technological improvements in energy efficiency measures and increasing competition may allow more improvements to meet the Golden Rule. Our modelling simplifications may also prevent some properties from meeting the Golden Rule[97]. Furthermore we assume that no landlord will voluntarily meet any shortfall in Green Deal credit to make improvements meet the Golden Rule. However, some landlords may choose to do this, especially if the shortfall is small and the property is then able to reach an 'E' , meaning that they will not need to seek a temporary exemption.

Table 10 – Improvement in Domestic PRS EPC ratings

	Percentage of F and G Stock
Can Reach E or above	73%
Make Some Improvement, but did not reach E	10%
No Improvement	17%

Source: DECC National Household Model

8.2.2 Non-Domestic Sector

157. The table below shows the improvement in EPC ratings amongst non-domestic buildings. It shows that 85% of non-domestic buildings with an initial rating of an 'F' and 'G' can make the 'E' standard, while a further 3% could make some improvement though not to 'E', while the remaining 12% could not make any improvement.

158. The higher proportions of properties able to make the minimum energy efficiency standard of a E within the non-domestic PRS reflects differences in the way in which EPC ratings within the domestic and non-domestic PRS sectors are assessed[98]

[97] See Annexes C, E and F for more information.
[98] The percentage making improvements in their EPC ratings are not comparable with the consultation stage IA; in the consultation stage IA, only those making improvements under the PRS Regulations were included in the table, whereas the analysis within the final IA includes business as usual uptake, as well as those making improvements under the Regulations. This

Table 11 – Improvement in Non-Domestic PRS EPC ratings

	Percentage of F and G Stock
Reach E or above	85%
Make an improvement, but don't reach E	3%
No Improvement	12%

Source: DECC Non-Domestic PRS Model

159. In reality, our estimates above may understate the number of non-domestic properties that can make EPC improvements - for the same reasons as stated above. However, there is also the possibility that they overstate the benefits, as within the non-domestic PRS, we are assuming that landlords have perfect foresight, and so, look to maximise their EPC rating within the Golden Rule constraint.

8.3 Uptake of Measures in the PRS

160. Table 12, below, shows the uptake of measures in the domestic PRS under the final policy option. The uptake of measures within the domestic PRS excludes measures that have been taken up with partial or full ECO support.

161. As shown in the table below, uptake of measures in the **domestic PRS** is dominated by relatively cheap measures: loft insulation accounts for around 21% of all measures delivered. There is also a large uptake of lighting (19% of the total), and cavity wall insulation (15%).

Table 12 Domestic Measure Uptake (excluding ECO) - Final Policy Option

Measure	Volume
Loft insulation	86,056
Low energy lighting	79,144
Cavity wall insulation	64,940
Hot Water Cylinder Insulation	48,732
Draught-proofing	39,432
Gas Combination Boiler	35,844
Internal wall insulation	23,543
Storage heater	17,057
Wet Central Heating	12,349
Standard OIL boiler	11,837
Double glazing	574
Total	419,509

Source: DECC National Household Model

162. In the **non-domestic PRS**, lighting represents the most commonly installed measure, followed by air source heat pumps, and replacement of boilers. Replacement boilers represented the most installed measure within the consultation stage IA; the lower proportion of boilers within the final stage IA is due to the shorter lifespans of lighting measures (which are installed more frequently than boilers – hence the higher volumes of lighting measures reported in the table below)

change was made because the latter breakdown gives a better indication of the energy efficiency of the PRS stock overall at the end of the appraisal period. Note, however, that all costs and benefits presented in this IA are net of counterfactual uptake and of measures funded by an ECO subsidy.

163. As with the domestic uptake of measures, the higher absolute volume of measures installed compared to those presented in the consultation stage IA is due to the re-installation of measures.

Table 13 Non Domestic Measure Uptake Under The Final Policy Option

Measure	Volume
Replacing tungsten GLS lamps with CFLs	162,072
HF (high frequency) ballasts for fluorescent tubes	151,454
Air Source Heat Pump	138,130
Replacing T8 laps with retrofit T5 conversion kit	69,981
Condensing Boiler	50,887
Cavity Wall Insulation	24,677
Other	43,452
Total	**640,652**

Source: DECC Non-Domestic PRS Model

8.4 Carbon Savings

164. Table 14 below shows the traded carbon savings from reduced electricity consumption and non-traded carbon savings from reduced consumption of gas and other fuels attributed to the Regulations under final policy option[99]. The tables show additional carbon savings only; savings from all ECO-subsidised measures are excluded because their savings are counted under the ECO policy.

165. The table shows that carbon savings rise over time within both the domestic and non-domestic PRS; estimated carbon savings during carbon budget 2 are expected to be very small, and attributed to those landlords that act early to comply with the minimum energy efficiency standard of an 'E' from 2018, or to energy efficiency improvements requested by domestic PRS tenants (from 2016, when the tenants' rights component of the Regulations coming into force).

166. In both the domestic and non-domestic PRS, the carbon savings rise over time, reflecting the gradual increase in PRS properties that need to make energy efficiency improvements in order to comply with the minimum EPC standard of an E rating from 2018.

167. In absolute terms, carbon savings are higher in the non-domestic PRS, reflecting the larger energy use per building in this sector. The absolute carbon savings are also higher than those presented in the consultation stage IA, due to the re-installation of measures once they expire.

Table 14 – Carbon Savings achieved due to the PRS Regulations

MtCo2		CB 2 (2013-17)	CB 3 (2018-22)	CB 4 (2023 – 2027)	Total (2013-2065)
Domestic	Traded	0.04	0.3	0.2	1.0
	Non-Traded	0.01	0.1	0.1	0.8
Non-Domestic	Traded	0.1	0.5	0.8	5.6
	Non-Traded	0.1	0.4	0.6	4.2

[99] An updated assessment of the impact of the policies on carbon emissions will be published in the 2014 Updated Energy Emission Projections (UEP). The UEP estimated impacts could differ from the ones presented here because of potential differences in final energy use and emission factors assumptions underpinning the forthcoming UEP projections.

Source: DECC Non-Domestic PRS Model and DECC National Household Model

8.5 Impact on the costs of ECO

168. One key impact of these regulations will be to reduce the costs of delivering energy companies' ECO compliance, as it is likely to reduce their search costs for suitable and willing households to install energy efficiency measures.

8.6 Health Impacts

169. As outlined in Section 2, making energy efficiency improvements to the least energy efficient properties may improve the health of the tenants. This includes a reduction in the risk of cardiovascular and respiratory diseases. We have monetised the health benefits associated with improving the EPC rating of the least energy efficient domestic PRS properties, using DECC's Health Impacts of Domestic Energy Efficiency Measures (HIDEEM) model (more details can be found in Exhibit 1, below).

170. Table 15 presents the results, based on the uptake of measures under the preferred policy option. Overall, the health benefits of the PRS Regulations are estimated to be around £100 million, with the largest benefits resulting from the installation of cavity and loft insulation (these are estimated to lead to monetised benefits of around ££56m and £36m respectively).

171. As can be seen from the table below, it has not been possible to monetise the benefits associated with the estimated uptake for some of the smaller measures (such as draught proofing and heating controls), due to limited data on the health benefits associated with these measure types. As these additional measures will increase the energy efficiency of the household and thus enable warmer homes and their associated health benefits to be realised, aggregate health impacts presented in the table below are likely to be understated.

Table 15: Monetised Health Benefits from the PRS Regulation

Measure	Total QALY	Total value of QALY (£)
Double glazing	**8**	195,860
Filled Cavity wall insulation	**2,576**	55,776,010
Loft insulation	**1,644**	36,109,530
MAINS_GAS Combi Boiler	**81**	2,103,460
Standard oil boiler*	**27**	694,640
Wet Central Heating	**11**	288,375
Internal wall insulation	**330**	**7,613,740**
Total	**4,677**	£102,781,615

Source: DECC HIDEEM

Exhibit 1 Health Impacts of Domestic Energy Efficiency Measures (HIDEEM)

We have been working with a team of leading experts from University College London and London School of Hygiene and Tropical Medicine to develop a model to estimate the change in occupants' health from the installation of energy efficiency measures (resulting from changes in the indoor temperature and pollutant exposure). The model that was developed is the HIDEEM model.

HIDEEM uses the EHS as a basis for the analysis. The model is built from a number of inter-related modules covering a building's permeability properties and individual health conditions. Pollutants included in the model that impact on health are: particulate matter, tobacco smoke, radon gas and mould growth. The health conditions linked to these pollutants include heart and circulatory diseases, cancers and strokes, as well as respiratory illness and common mental disorders. HIDEEM uses the Quality Adjusted Life Year (QALY) method to monetise these health impacts. This involves placing a value on the change in a person's health over time.

More details on HIDEEM can be found within the Fuel Poverty Strategy Analytical Annex
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/211137/fuel_poverty_strategic_framework_analytical_annex.pdf

9. Sensitivity analysis

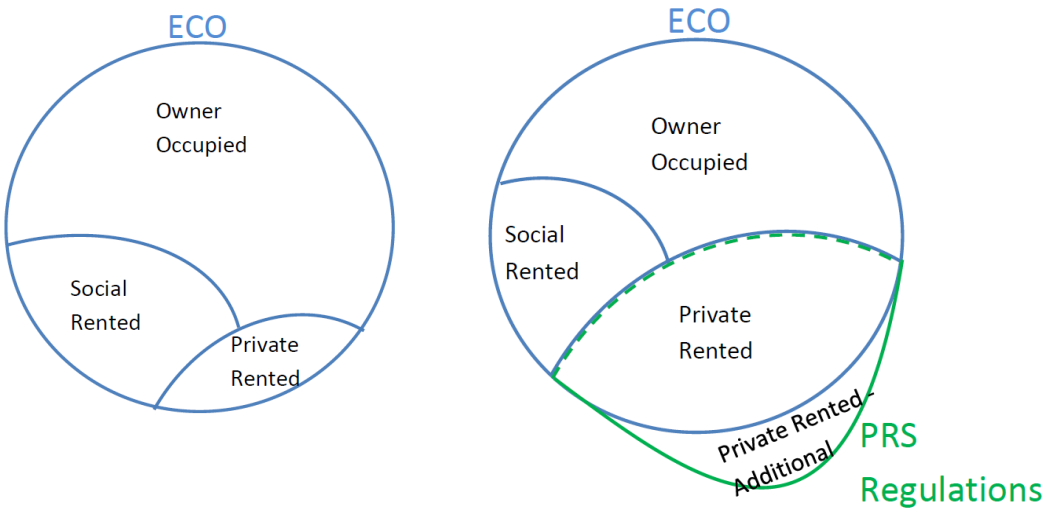
9.1 Domestic Sensitivity Analysis

172. The costs and benefits of the PRS Regulations to landlords, tenants and wider society will, in part, depend on factors independent of the policy. Sensitivity analysis has been undertaken on key uncertainties that could have an impact on the costs and benefits of the policy. These are outlined below and are all conducted around the final policy option.

Higher and Lower ECO Coverage

173. As ECO subsidy is delivered via energy companies, their contractors, or independent Green Deal providers, it is likely that not all ECO eligible PRS households undertaking energy efficiency measures will be offered ECO subsidy. In the case of it coinciding with other improvement work, for instance, the preferred installer may not have a route to sell ECO points. Therefore, the proportion of PRS households that would have access to ECO funding post April 2018 (once the Regulations come into force) is not known. An assumed 'ECO coverage rate' of 70% for the domestic PRS modelling is used in the central scenario, implying that 70% of the domestic PRS housing stock has access to ECO subsidy aid, allowing them to carry out the works prompted by PRS Regulations.

174. The figures below show the interaction of PRS regulations with ECO. The solid and dashed green lines show the coverage of the PRS regulations, while the blue lines show the coverage of households receiving ECO. Reading the figures below from left to right shows that a change in uptake of ECO-qualifying energy efficiency measures resulting from the Regulations increases take-up of ECO amongst PRS households, but displaces other sectors' households. As a result, this IA only considers additionality from the regulations in the area labelled 'Private Rented – Additional', which is those PRS households who do not receive an ECO-subsidised measure.



175. We have conducted sensitivities around the proportion of PRS households installing measures who receive an ECO subsidy by increasing and reducing the ECO coverage rate by 20 percentage points for all ECO-qualifying measures (from 70% to 50% and 90% coverage), to determine its impact.

176. The impact is to lower and raise the amount of capital spend on energy efficiency measures attributable to the PRS Regulations in the domestic sector by around 70% under both the high and low ECO coverage scenarios, respectively. Savings are lower under the higher coverage because the additional measures captured by ECO are not considered additional for the purposes of this IA, as they are benefits are accounted for under the ECO policy. In contrast, more of the savings are considered additional under the low ECO

coverage scenario. The change in energy savings delivered under the sensitivities change by a similar proportion to the installation costs, varying by around 70% between the central and low ECO scenario, and central and high ECO scenario (as shown in Table 16, below).

177. The results show that higher ECO coverage lowers the overall net benefits of the PRS Regulations, whereas lower ECO coverage increases it. This is expected, as lower/higher ECO coverage means that more/less of the costs and benefits can be attributed to the PRS policy, rather than to ECO (which has been captured within the ECO IA, and excluded from the costs and benefits within this IA to avoid double counting across the IAs).

178. The table below shows that the high ECO scenario (with finance costs) has a slightly negative NPV. However, recall that under this scenario, up to 90% of the costs and benefits of homes being treated are being attributed to the ECO IA, while all of the costs to local authorities and DECC of the Regulations remain attributed to this IA. The lower ECO coverage rates under the central and low ECO scenarios illustrate the impact the assumed ECO coverage has on the NPV - as we lower the ECO coverage, the costs and benefits of the Regulations attributed to this IA rise - and, under these scenarios, these more than offset the costs to local authorities and DECC, resulting in a positive NPV.

179. Removing finance costs from the cost benefit analysis, meanwhile, results in a small positive NPV for the high ECO scenario of £55m.

Higher and Lower Fuel Prices

180. The marginal changes in net benefits under the high and low fuel prices are driven primarily by fuel switching and the distribution of carbon savings between traded and non-traded carbon energy sources. This occurs for the following reasons:

- The energy savings delivered under the low fuel prices scenario has no fuel switching occurring. This means that the majority of value in the carbon saved comes from the non-traded sector (gas, oil, LPG, and so on), rather than from traded carbon (electricity) where the decarbonisation of the grid reduces the value of these savings over time much more than in the non-traded sector.
- The central scenario's energy savings are greater than in the low fuel price scenario but some households switch from electric heating to gas and oil heating sources. This increases the value of the traded sector savings (EU allowances) but the value of these savings falls over time due to decarbonisation of the grid. It also reduces the scale of non-traded savings as households switch to non-traded fuels. This fuel switching has a negative impact on air quality, particularly from those who switch to oil. This reduces the air quality savings to a level below those delivered by the low-price scenario, above.
- The high scenario's energy savings are greater than the central scenario, but fewer households switch from electric heating to other fuel sources. This reduces the value of traded carbon, and increases the value of non-traded carbon. Higher fuel prices also mean that more measures can be installed within the within the Golden Rule. However, while this helps to increase energy savings, and further increase non-traded carbon savings and air quality benefits, these are more than offset by the increased costs of the additional measures installed, leading to a smaller overall NPV.

Table 16 Domestic Sensitivities (2014-2065), £m, 2013 prices

	Central Scenario	High ECO	Low ECO	High Fuel Prices	Low Fuel Prices
Installation costs	£321	£107	£536	£385	£277
Hidden costs	£32	£11	£54	£39	£28
Assessment costs	£11	£4	£18	£11	£10
Green Deal Finance costs	£218	£73	£363	£252	£192
Costs to Local and Central Government	£27	£27	£27	£27	£27
Understanding the Regulations	£16	£16	£16	£16	£16
Total costs (£m)	£625	£237	£1,014	£730	£551
Energy savings (variable element)	£396	£132	£661	£420	£324
Comfort Benefits	£140	£47	£234	£147	£112
Air quality benefits	£60	£20	£99	£84	£66
Lifetime EU Allowance savings	£25	£8	£42	£24	£20
Lifetime non-traded carbon savings	£36	£12	£59	£58	£56
Total benefits (£m)	£657	£219	£1,095	£733	£579
Net Present Value (£m)	**£32**	**-£18**	**£82**	**£3**	**£29**
Net Present Value Excluding Finance Costs (£m)	**£250**	**£55**	**£445**	**£255**	**£221**

Source: DECC National Household Model

9.2 Non-domestic: Sensitivity analysis

181. The non-domestic sensitivity analysis also explores the impact of key uncertainties to the analysis. The sensitivities performed here are broadly the same as in the domestic sector, although no ECO sensitivity is performed, as ECO subsidies is only available in the domestic sector.

Higher and Lower Fuel Prices

182. With higher energy prices, bill savings from the installation of energy efficiency measures are larger than under the final policy (central) option. This means (all else equal) that more measures can be installed within the Golden Rule threshold, or that more properties can meet the Golden Rule. The opposite is the case under the low energy price scenario.

183. The lower volume of energy efficiency measures installed under the low scenario leads to lower monetised energy and non-traded carbon savings, relative to the central scenario. The variation in the traded and non-traded carbon savings between the high fuel price sensitivity and the central scenario, meanwhile, are broadly similar to those in the domestic sensitivities, and for similar reasons to those outlined under the domestic fuel price sensitivities, above. However, greater energy savings per property treated in the non-domestic properties leads to greater variation in the energy savings between the high and central scenarios. This means that under the high fuel price scenario, the additional monetised energy saving more than offset the greater installation costs, meaning this sensitivity has the highest NPV.

184. Some of the differences in the outcome between the domestic and non-domestic fuel price sensitivities reflect differences in the way energy efficiency ratings are derived within the domestic and non-domestic PRS[100].

Table 17 Non-Domestic Sensitivities (2014-2065), £m, 2013 prices

	Central	High Fuel Prices	Low Fuel Prices
Installation costs	£1,234	£1,269	£1,150
Hidden costs	£123	£127	£115
Assessment costs	£88	£87	£89
Green Deal Finance costs	£284	499	£217
Costs to Local Authorities	£11	£11	£11
Understanding the Regulations	£13	£13	£13
Total costs (£m)	£1,743	£2,006	£1,596
Energy savings (variable element)	£3,223	£3,808	£2,570
Air quality benefits	£17	£18	£17
Lifetime non-traded carbon savings	£240	£286	£230
Lifetime EU Allowance savings	£276	£265	£277
Total benefits (£m)	£3,756	£4,377	£3,094
Net Present Value (£m)	**£2,013**	**£2,371**	**£1,499**
Net Present Value Excluding Finance Costs (£m)	**£2,297**	**£2,870**	**£1,716**

Source: DECC Non Domestic PRS Model

100 For example, domestic energy efficiency improvements are influenced by the cost of energy, whereas in the non-domestic sector, they do not.

10. Landlord and PRS Market Impacts

185. This section discusses the impacts of the Regulations on landlords and the domestic PRS market.

10.1 Landlord Costs and Benefits

Domestic Sector

186. Section 7 outlines that the vast majority of costs fall on tenants (who are expected to receive the benefit from reduced fuel bills). However landlords incur the costs of reading and understanding the Regulations, paying for a Green Deal Assessment (where landlords are charged for the assessment), and the landlord portion of the hidden costs (assumed to be 75% of the total). In addition, landlords will have to pay any Green Deal repayments during (usually very short[101]) void periods between tenancies. They also benefit from a potential increase in property prices (reflecting the increased energy efficiency of the building).

187. The exact distribution of costs between the landlord and tenant will vary from property to property. However, three illustrative examples of the potential costs and benefits of the Regulations to landlords are described below[102]. They give an indication that landlords are generally expected benefit from the policy.

Table 18 – Examples Used for the Assessment of Costs and Benefits to Landlords

Example	*Building Type*	*Starting EPC Score*	*Percentage of F and G rated PRS stock*	*Measures Installed (under the Green Deal)*	*Post Installation EPC Score*	*ECO or local authority grant?*
1	-Detached house -Electric Heating -Solid Walls	G (SAP score of 19)	0.16%	Solid Wall Insulation	E	No
2	-Mid-Terrace House -Electric Heating -Gas Connection -Loft Insulation <125mm	G (starting SAP score of 5)	0.08%	Loft Insulation, Cavity wall Insulation, New Storage Heaters & Hot Water Cylinder Insulation	E	No
3	-Detached house -Coal Fires -No Gas Connection -Solid Walls	G (starting SAP score of 11)	0.06%	Solid Wall Insulation, Condensing Oil Boiler, Radiators & Piping, Hot Water Cylinder Insulation	E	No

Source: DECC National Household Model

188. Table 19, below, shows the net impact of these examples, using a discount rate of 3.5% and assuming the works are carried out in 2018, and the property is sold in 2025[103]. In all three cases the potential increase in property value would be expected to outweigh the modest costs to landlords. This reflects the broader policy intent that the landlord does not generally bear the costs of the energy efficiency measures. Many of

[101] As discussed in Section 4, the average void period is 3 weeks, according to the Association of Letting Agents http://www.arla.co.uk/media/466322/ARLA-PRS-Report-Q4-13.pdf

[102] While these examples represent just 0.3% of the domestic PRS stock, there are over 1,6500 different property types within our domestic model, with no one group comprising a large percentage of the stock. These examples were chosen because they were considered broadly representative. See Annex E for more information on the domestic building stock contained within the domestic model.

[103] See Section 7 for a description on how the increase in market value was estimated.

the costs borne by landlords will be passed onto tenants indirectly over time through marginally higher rents.

189. These examples are conservative, as they do not include any subsidisation of energy efficiency measures – though ECO, current incentive schemes, such as the existing Green Deal Home Improvement Fund (for landlords that act early to comply with the Regulations), or any future incentive schemes. These may reduce the costs of making the energy efficiency improvements. Landlords may also choose other financing arrangements other than taking out a Green deal loan in order to make the energy efficiency Improvements (although they are not obliged to do this under the Regulations). Under these circumstances, costs such as Green Deal assessment costs would not be incurred.

Table 19 – Net impact to individual landlords using the examples above

Example Property:	**1**	**2**	**3**
Upfront financial cost			
Green Deal Assessment Costs[1] *(weighted average, assuming 80% free, 20% paid £112.50)*[2]	£24	£24	£24
Delayed financial cost			
Green Deal Credit Repayments During Void Periods (over 7 years)[3]	£257	£152	£627
Non-financial cost			
Understanding the Regulations	£10	£10	£10
Hidden costs (we assume the majority of these costs will be non-financial but some financial costs might be incurred)	£436	£237	£1058
Total Costs	**£727**	**£423**	**£1,719**
Increase in Property Value[4]	£2,763	£3,206	£2,763
Total Benefits	**£2,763**	**£3,206**	**£2,763**
NPV (to landlords)	**£2,036**	**£2,783**	**£1,044**

Source: DECC analysis using the National Household Model

Landlords owning properties that do not meet the Golden Rule

190. Some landlords may find that their recommended improvements do not pass the Golden Rule and therefore may not undertake improvements that lead to the benefits outlined above. However:

i. Landlords in any case are required to have or obtain an EPC for the property on let. The EPC component of a Green Deal Assessment is the largest cost component, which they are required to pay under existing legislation. Where the landlord has an EPC in place, they should be able to use one of the on-line tools to estimate savings potential, and the likely benefit of a Green Deal assessment.
ii. Survey data indicates that assessments are, in a majority of cases, being offered free of charge.
iii. The Minimum Standards target the least energy efficient properties, which are expected to have the largest potential for energy efficiency improvements.
iv. Should there be small costs relating to a Green Deal assessments landlords may pass on such small costs through to tenants in marginally higher rents
v. Landlords may choose to voluntarily undertake improvements where costs require a top up in funding, even if this is not required by the Regulations.

[1] As outlined in sections 3 and 7, existing evidence suggests that around 80% of assessments are currently being offered free of charge (see the published Green Deal Assessment Research for more information: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/271608/Waves_1_2_and_3_plus_wave_1_follow_up_-_full_report_P23_-_24_-_FINAL.pdf). Where landlords are not charged for their Green Deal assessments and have not received ECO subsidy, we assume that the costs of these assessments are recouped as part of the Green Deal loan repayments. This means that landlords will pay a small portion of the assessment charge while the property is vacant.

[2] Landlords, which are treated as businesses for the purposes of the IA, can re-claim VAT costs. This reduces the Green Deal assessment charge slightly to around £107 (assuming 5% VAT is paid on the package).

[3] These Green Deal loan repayments during void periods include a portion of an assumed Green Deal set up charge of £63. This set up cost is assumed to be recouped by the Green Deal Finance company over the lifetime of the loan (consistent with treatment in the ECO IAs), which means that this cost is mostly borne by the tenant.

[4] Potential increase in property value. Data limitations mean that it has not been possible to differentiate between the capital price uplift for properties of different sizes.

191. Costs incurred by landlords that are not able to take out a Green Deal plan are expected to be small, and in the unlikely event they do occur are expected to be limited to understanding the Regulations, assessment costs, and demonstrating a valid exemption from the Regulations[104].

Non-domestic private rented sector

192. As discussed in Section 7, we do not have statistically significant data to demonstrate that an increase in market value occurs when improvements are made to the energy efficiency of buildings in the non-domestic PRS[105], despite seeking evidence during the consultation. We have therefore been unable to quantify the impact to landlords owning properties in the non-domestic PRS.

10.2 Impact of the PRS Regulations on the domestic housing market

The Impact of Regulations on the PRS

193. Studies on the relationship between regulation and the size of the private rented sector suggest the relationship is ambiguous. For example, a study conducted by the London School of Economics (LSE)[106] found that stringent Regulations within the PRS are not inherently associated with smaller sector size. It notes that some of the largest private rented sectors (based on its percentage of the overall domestic building stock), notably in Germany, have the most stringent PRS Regulations.

194. Another LSE study[107] finds that, internationally, there is no clear relationship between the change in level of regulation over the past few decades and the change in size of the PRS sector, and that other factors, such as taxation, subsidies and social housing could be just as important as regulation in determining the size of the sector. This study also notes that in many countries, decreases in regulation have historically been associated with decreases in the size of the sector.

195. In the UK, the LSE study notes that while the level of regulation in the PRS has decreased (while the size of the sector has increased), this appears more to do with the expansion of the buy to let market, rather than due to a decrease in the level of regulation. The study also argues that investment is unlikely to be affected by regulations. This is because in countries like the UK, at the point of investment, the investor knows that it is relatively easy to transfer properties between different tenure types.

196. While the majority of the evidence suggests that regulations do not have a negative impact on the size of the PRS, some studies suggest regulations can have a negative impact. Ball (2004)[108], for example, notes that higher quality housing will limit tenant choice, limiting their option of accepting lower quality housing for lower rent.

197. Turner and Malpezzi (2003), summarise the existing studies on the relationship between regulation and the size of the PRS sector, stating "regulation per se is neither good nor bad. What matters are the costs and benefits of specific Regulations under specific market conditions"[109].

Investment within the PRS

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[104] As discussed in Section 7

[105] Although there is no UK study which demonstrates this, we expect that an improvement in value will be delivered, based on international evidence suggesting that an increase in property values does occur even within the non-domestic PRS.

[106] http://www.lse.ac.uk/geographyAndEnvironment/research/london/events/HEIF/HEIF4b_10-11%20-newlondonenv/prslaunch/Book.pdf

[107] http://www.lse.ac.uk/geographyAndEnvironment/research/london/pdf/The-Private-Rented-Sector-WEB%5b1%5d.pdf

[108] Ball, Michael (2004) *The Future of Private Renting in the UK. London: Social Market Foundation.* http://www.smf.co.uk/assets/files/publications/TheFutureofPrivateRentingintheUK.pdf

[109] http://ww.bus.wisc.edu/realestate/documents/Rent%20Control%20Recent%20Literature%20Malpezzi%20Turner.pdf (see page 6)

198. Investment in the private rented sector is similar to other types of investment – namely that the expected net present value of an investment should be at least as high as substitute investments, and ideally should pass some minimum (or hurdle) rate of return[110]. Landlords will consider the costs and benefits to them as set out in table 19 above.

199. Research suggests that the most important factor in whether or not to invest in the PRS is the anticipated capital appreciation, with rental income of secondary consideration. For example, a report by Shelter[111] (summarizing the findings of other studies) states: "The overwhelming majority of returns over the next fifteen years are likely to stem from house price changes rather than rental income. This has been the model for residential investment over the past decade or more and seems unlikely to change. As a result, changes to rental terms and conditions have only a marginal effect on overall investment returns" (paragraph 7.1.18)

200. With capital gains expected to be the key driver of investment within the domestic PRS, the Regulations are unlikely to hamper investment. For example, there is wide body of international research suggesting that improving the energy efficiency of properties increases a property's value and/ or rent levels, as outlined in the Section 7.

Potential Investment Displacement

201. Investment in energy efficiency could also displace other productive investments. This situation could arise, for example, if landlords were credit constrained, and therefore had a limited amount of funds to invest in their properties.

202. Investment in energy efficiency under the PRS Regulations is unlikely to cause displacement, however, as the investment is predominantly funded by the tenant, not the landlord. This is not to the detriment of the tenant, as they also benefit from lower energy bills (net of Green Deal credit repayments).

203. Similarly, landlords involved in construction activity (for example in installing larger energy efficient measures in properties out of scope of these Regulations) are unlikely to change their behaviour as a result of PRS. Again this is because they incur only a small fraction of the costs in most cases.

Jobs and growth

204. Driving demand for energy efficiency may support jobs in the green construction sector. How jobs sustained evolves over time (as a result of the PRS policy) will depend on when landlords undertake the energy efficiency improvements, and which measures they install.

Rent affordability

205. Demand for housing within the private rented sector is relatively unresponsive to rent levels, partly due the inability of tenants within the PRS to obtain suitable alternative forms of accommodation in either the owner occupier or social housing sector. This makes it likely that landlords will be able to pass through some, if not most, of the costs they incur as a result of the Regulations onto tenants in the form of marginally higher rents. Overall costs of occupation for tenants however may be lower or unchanged due to energy bill savings from an improved property. This is especially likely to be the case where improvements are part funded through ECO or other energy efficiency support schemes/grants.

[110] This rate of return is typically around 6%, according to the RLA http://www.google.com/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=4&cad=rja&ved=0CDsQFjAD&url=http%3A%2F%2Ftheehp.com%2Fwp-content%2Fuploads%2F2012%2F06%2FRLA-Response-to-Prof-Ball-Report.docx&ei=cZQTUsrPFIrL0AXQ7YGQDQ&usg=AFQjCNGQ8y4k9nX_xXsoVBbaTgaCACozbQ&sig2=JfRKxIkLcza5gl7nXDlwiw&bvm=bv.50952593,d.d2k

111 http://england.shelter.org.uk/__data/assets/pdf_file/0004/569641/Jones_Lang_LaSalle_PRS_Shelter_report.pdf

206. As outlined earlier in Section 10, the costs of the Regulations to landlords are expected to small, with the majority of costs borne by the tenant. With only a small subset of PRS properties are expected to act in any given year[112], costs may be passed on over several years, limiting the rate at which landlords pass on costs.

207. A more detailed discussion on the drivers of rent affordability can be found in the Department for Communities and Local Government Impact Assessment on rent affordability.[113]

[112] For example, around 10% of domestic PRS properties have an F- or G-rating. Early movers and the soft start under two of the policy options will ensure that only a fraction of this 10% will act in any given year post 2018. Some of the stock will also be exempt.

[113] The issue of rent affordability more generally is addressed elsewhere. For example, DCLG recently published an impact assessment on increasing rent affordability https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6021/1918816.pdf https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6021/1918816.pdf / Also, the 2013/14 report from the Communities and Local Government Select Committee http://www.publications.parliament.uk/pa/cm201314/cmselect/cmcomloc/50/50.pdf includes recommendations for how to increase investment in the PRS to increase affordability.

11. Wider Impacts

11.1 Equivalent Annualised Net Cost to Business (EANCB)

208. This section of IA looks at the direct costs and benefits to businesses to calculate the equivalent annualised net cost to business, which is calculated to assess net impact of the Regulations for one in, two out purposes. Direct costs or benefits are defined in Better Regulation Executive guidance as costs or benefits that can be identified as resulting directly from the implementation or removal/simplification of a regulation[114].

209. For One-in-Two-Out (OITO) purposes we assume that all landlords are businesses. In addition, we assume that all non-domestic tenants are businesses.[115]

11.1.1 Direct Costs and Benefits

Direct Costs

210. All monetised costs to businesses are considered to be direct. For landlords in the domestic sector this implies the following are direct costs:

(i) Green Deal assessment costs (where not provided free)
(ii) Costs of understanding the Regulations
(iii) Some of the hidden costs (shared with the tenant)
(iv) Green Deal credit repayments during void periods

211. There are no monetised costs to landlords that are treated as indirect.

212. These costs are expected to be passed onto tenants over time through rent. However, as they are incurred by landlords first, they have been treated as direct costs for the OITO purposes.

213. In the non-domestic sector (where both landlords and tenants may be classified as a business) all costs are considered to be direct and included in the OITO calculation.

214. The annual direct costs used for the OITO calculations are estimated to be £58.9m. This is lower than the £68.7m quoted in the consultation stage IA, and largely reflects updates to the evidence base discussed in Section 5.4; the breakdown of these costs is shown in the table below.

Direct benefits

215. Energy savings are direct and initially accrue to tenants in the form of lower bills. These accrue automatically as a result of installing the mandated energy efficiency measures with no further action required. [116] Some of these benefits may be passed through to landlords in the form of higher rents, which are then capitalised into property values. This is discussed in detail in Section 7. These pass through benefits, estimated at £16.6m, are treated as indirect benefits for the purposes of OITO and are excluded

114 Definitions of direct costs and benefits can be found within the Better Regulation Framework Manual, along with the methodology used to calculate the annualised equivalent net cost to business https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/211981/bis-13-1038-better-regulation-framework-manual-guidance-for-officials.pdf

115 In practice, a small number of non-domestic tenants will be public sector. For this IA it has not been possible to quantify what impact this may have and so have assumed all non-domestic tenants are businesses.

116 For the vast majority of tenants, no action will be required in order to accrue these savings. For example, improved insulation will warm the property more quickly reducing the need for the heating to be on for long periods of time. Though a small number of measures may require some action on the part of the tenant in order for the benefit to accrue, it has not been possible to quantify the proportion at this stage. For this reason, we make the simplifying assumption that all of the energy bill reductions business tenants get as a result of installing energy efficient measures are direct.

from the EANCB calculation. Note that in the consultation stage IA, property values were treated as direct benefits. Following further consideration, this has since been changed, reducing the direct benefit to businesses (relative to that which we would see with their inclusion).

216. Tenants are classified as businesses in the non-domestic PRS and the bill savings are accounted for by only this group.

217. The other benefits of the Regulations discussed elsewhere in the IA are deemed indirect and do not feature in the OITO calculation.

218. The annual direct benefit used for the OITO calculations is estimated to be around £153.6m – these benefits are higher than the quoted in the consultation stage IA (£107.4m), reflecting the re-installation of measures. This is calculated from the benefits as described in Section 7.3.

Net OITO position

219. The net OITO position, based on the equivalent annual net cost to business (EANCB), is shown in Table 19 below. The direct costs and benefits occur between 2014 and 2065. Current estimates show the direct benefits outweigh the direct costs. The measure is therefore a 'Zero Net Cost' regulatory measure.

Table 19 Equivalent Annual Net Cost to Business

Policy Option	***Final***
EANCB (£m), 2009 prices	-£94.8

220. The breakdown of the equivalent annual net cost to business is shown in Table 20 below. As only landlords are treated as businesses in the domestic sector, and only bear a fraction of the overall costs of installing the energy efficiency measures (Green Deal credit payments during void periods, 75% of the hidden costs, and Green Deal assessments, where a fee is charged), domestic costs (£2.1m) only contribute a fraction of the overall EANCB.

221. The largest components of costs and benefits are in the non-domestic sector, where both the landlord and tenant are treated as businesses. The gross bill savings of around £153.6 outweigh the total costs to both tenants and landlords of around £58.9m. Non-domestic costs include all costs incurred by the landlord and tenant (including installation and Green Deal finance costs).

222. Finally, there are small costs associated with complying with Regulations for domestic and non-domestic landlords, although these comprise a very small fraction of overall costs (£0.9m).

Table 20 Breakdown of EANCB by Component

	Component	***EANCB (£m)***
Costs	Landlord Share of Domestic Costs	£2.1
	Landlord/ Tenant Share of Non Domestic Costs	£55.9
	Compliance Costs	£0.9
Total Costs		**£**58.9
Benefits	Tenant Gross Bill Savings	-£153.6
Total Benefits		-£153.6
Net EANCB		**-£94.8**

223. The overall net benefit to businesses, meanwhile, is estimated to be around £2.9bn. The slightly higher net benefit to business, relative to that of society, reflects the difference in magnitude of the retail price series, used to monetise energy bill savings to tenants for the distributional analysis section here, and the 'long run variable costs of energy supplied' series, used to monetise the energy savings to society. The latter is lower, partly because it strips out transfers between different groups in society[117].

11.2 Small and Micro Business Assessment

Characteristics of Businesses within the PRS

224. Table 21, below gives the breakdown of portfolio size for domestic landlords. This shows that the majority of domestic landlords own one property (78%) and only around 1% of landlords own 25 or more properties.

225. This distribution is based on all PRS properties. Similar data for properties that are specifically, 'F' or 'G' rated are unavailable.

Table 21 – Properties Owned by domestic landlords

Number of Properties	***Percentage of Landlords***
1	78%
2-4	17%
5-9	3%
10-24	1%
25-100	1%
>100	0%

Source: DCLG Private Rented Sector Landlords' Survey 2010

226. Table 22 sets out the percentage split of rented commercial property ownership in the UK. Around 78% of rented commercial property is owned by UK Institutions, overseas investors, collective investment schemes,

[117] The use of the retail price series for distributional analysis is in line with Green Book supplementary guidance.

UK Real Estate Investment Trusts and listed property companies, suggesting that only a small minority of rental properties are likely to be owned by small to micro businesses.

Table 22 – Commercial property ownership in the UK[118]

Type of Owner	***£bn***	***% Change 2003-13***	***% of Total***
UK insurance companies and	41	-29	11
UK pensions funds	30	-1	8
Overseas investors	88	113	24
Collective investment schemes	59	118	16
UK REITS and listed property companies	52	30	14
UK unlisted property companies	50	0	14
Private investors	10	27	3
Traditional estates/ charities	16	18	4
Other	18	5	23

Source: British Property Federation

Classification of PRS Landlords as small and micro businesses

227. As most landlords in the domestic PRS only own one property, it seems appropriate to make the conservative assumption that all landlords in the domestic sector should be classified as small or micro businesses for the Small and Micro Business Assessment. It should be noted, however, that most landlords obtain at least 25% of the income from other sources, according to the Private Rented Sector Landlords survey[119], which means that classifying most (if not all) landlords as small and micro businesses may be a conservative estimate.

228. There are around 1.6 million domestic landlords within the UK[120]. Given most landlords only own one property, they are highly unlikely to require more than 49 staff. This suggests approximately 1.6 million small and micro businesses are affected by the Regulations. In contrast, very few medium or large businesses are expected to be directly affected.

229. It has not been possible to estimate the number of small and micro businesses in the non-domestic PRS, as the data needed to make this assessment are not available, even though evidence was sought on this during the consultation process.

Rationale for the non-exclusion of small and micro businesses from the Regulations

230. As we estimate that all domestic landlords should be classified as small and micro business for the purpose of this assessment, their exclusion would remove most if not all, of the intended benefits of the policy.

231. Many of the costs incurred by landlords as a result of the Regulations are likely to be on a per-property basis – meaning that landlords with small property portfolios (and therefore deemed to be small or micro businesses, as discussed above) will not be disproportionately burdened by the Regulations. These costs, should they occur, are likely to involve: the costs associated with undertaking Green Deal assessments

[118] http://www.bpf.org.uk/en/files/reita_files/property_data/BPF_Property_Data_booklet_2013_spreads_web.pdf. There is no data on the number of landlords in England and Wales.
[119] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/7249/2010380.pdf
[120] http://www.landlords.org.uk/membership

(where not provided for free), Green Deal repayment costs during void periods (where Green Deal credit is used), and the costs of obtaining relevant permissions should they be required (for example, freeholder consent).

232. With the costs of understanding the Regulations, however, there are clear economies of scale – with landlords with large property portfolios able to spread these costs over a large number of properties. Other costs, such as organising finance or installation could also benefit from economies of scale, meaning that those landlords that own many properties may face less hidden costs per property than smaller landlords. However, economies of scale are a natural advantage of larger firms and as such should not be attributed to the design of policy. Regulation would offer equal opportunities and requirements for each property, regardless of the owner.

233. It should also be noted that while small and micro businesses comprise most of the sector, only a minority of businesses are required to take action as a result of the Regulations, with only landlords owning the least thermally efficient properties (those, F and G rated) required to make energy efficiency improvements. With the proportion of these less energy efficient properties expected to fall over time, it is likely that an even smaller proportion of properties will need to act by the time the Regulations come into force in 2018.

Mitigating the impact on small and micro businesses

234. The Regulations include provisions to protect landlords that might suffer disproportionately from the Regulations. For example, a landlord will be able to refuse tenants requests for upgrades on the grounds of reasonableness in some instances.

235. Similarly as outlined in Section 4 (which sets out the policy design) and Section 10 (which sets out the examples of costs and benefits to individual landlords), landlords are not expected to be made worse off as a consequence of the Regulations.

236. The Government is also committed to laying the Regulations as soon as possible. This will not only provide certainty to the industry, but will also allow them time to meet voluntarily the minimum standard in advance of the Regulations coming into force if they wish to[121]. As the trigger point for landlords' actions is the start of new tenancies, this will give landlords further discretion around when to carry out the works. For example, the stipulation that landlords only have to comply at the start of new tenancies will allow them the option to complete the upgrade works during the void period before the new tenant moves in, which is also likely to reduce any hidden costs associated with the upgrades[122].

237. It is also possible that some of the burden faced by some small and micro landlords is partially offset through the use of letting agencies. These agencies may, in some instances, bear the costs of understanding the Regulations[123,] and can therefore advise landlords using the agency about compliance. Agents are likely to have economies of scale as they may manage a number of properties on behalf of landlords. However, this will only help offset the costs in a small number of instances, with around 68% of small landlords not using letting agencies when letting out a domestic property[124].

238. If the Regulations place additional burden on small businesses, a related question is how much of a burden the PRS Regulations are likely to be. Repair and maintenance (something closely related to upgrading the energy efficiency of a property), for example, is not perceived as a major issue for landlords, with only a tenth (10%) of landlords considering the cost of repairs to be a serious problem –as was the related question of finding reliable builders or tradesmen (and 60% perceiving that the cost of repairs was not a problem).

[121] They could carry out the work as part of the property/properties normal refurbishment cycle, for example.

[122] The average void period in the domestic sector is around 3 weeks a year, according to ARLA's PRS landlords survey http://www.arla.co.uk/media/466322/ARLA-PRS-Report-Q4-13.pdf

[123] Many letting agencies may also be classified as small and micro businesses. However, the costs borne by letting agencies is expected to be very small.

[124] Source: http://www.bdrc-continental.com/media-centre/landlords-panel-on-use-of-lettings-agencies/

239. The policy has been designed to recognise that allowing landlords more time to meet the minimum standard before the Regulations apply may not, on its own, fully offset the burden that may be placed on landlords as a result of the Regulations.

11.3 Justice Impact

240. The impact of the PRS Regulations on the justice system can be found in the attached justice impact assessment (see Annex G).

11.4 Equality Impact

241. This section of the IA provides an assessment of the PRS Regulations against the protected characteristics of age, disability, gender, gender-reassignment, marriage and civil partnerships, pregnancy and maternity, race, religion or belief and sexual orientation, as specified in the Equality Act 2010. It also outlines where changes have been made to ensure all opportunities to promote equality are taken. Where a particular protected characteristic is not listed below for a policy sub-heading, it is because there is no evidence that people with this protected characteristic are more or less likely to benefit from the policy or are discriminated against by the policy.

Age

242. In the PRS young adults are overrepresented (68% of those under 24 years old live in the PRS). Over 55s are underrepresented with only 5% in the PRS and a much higher proportion in owner occupation.

Table 24 – Proportion of Age Group Living in the PRS

Age	Proportion in PRS
16-24	68%
25-34	45%
35-44	21%
45-54	12%
55-64	7%
65 or Over	5%

Source: English Housing Survey, 2012-13.

243. Because of this skew, if regulation of private landlords was brought into force it could do more for young adults. This would be a positive impact as it will be contributing to promoting equality across all groups.

Gender

244. Lone parents comprise around 9% of all PRS tenant households, but around 31% of private renting households are on housing benefit [125]) .Office of National Statistics figures suggest that in approximately 9 out of 10 of these households a female will be the single parent.

245. Improving the energy efficiency of the housing stock in the private rented sector could have a particular positive effect on this section of society, with benefits for single mothers. It is not possible to draw any more detailed inferences about ramifications for gender equality. It will be important to look to maximise benefits when developing secondary legislation.

[125] The Rugg Review http://www.york.ac.uk/media/chp/documents/2008/prsreviewweb.pdf

Ethnicity

246. The least populous ethnic minorities are the more highly represented in the PRS. These groups may stand to gain most if Regulations are brought into force.

247. The breakdown of ethnic groups in the PRS is shown below.

Table 25 – Ethnicity within the PRS

Ethnic Group	***Percentage within the PRS***
White	17%
Black	21%
Indian	26%
Pakistani or Bangladeshi	21%
Other	36%
All Ethnic Minority	27%

Source: English Housing Survey, 2012-13

Disability

248. 35% of fuel poor households contain someone who is registered disabled or long term sick[126]

249. Though Government does not have statistics specific to the PRS it is reasonable to assume that, as the PRS has the highest proportion of non-decent homes and homes that fail to provide a reasonable degree of thermal comfort the regulation of private landlords would have a positive effect on the long term ill/ disabled. However, it is not possible to draw any more detailed inferences about the likely impacts.

Human Rights

250. Proposals for the private rented sector engage Article 1 of Protocol 1 to the European Convention on Human Rights, as they will affect landlords "property rights by controlling the use of rented property".

Health impacts

251. Living in cold conditions is linked to a number of detrimental physical and mental health impacts. A number of studies have concluded that inadequate levels of heating and other factors associated with fuel poverty are linked, in particular, to respiratory problems in children and an increased risk of mortality in older adults[127]. Other sources also highlight the risk of respiratory problems among adults and the potential development of influenza, pneumonia and asthma, alongside an increased risk of arthritis and accidents at home linked to poorly heated housing[128].

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126 In 2011 under Low income high costs measure 34.9% of all fuel poor households contain someone with a long term illness/disability. Source: https://www.gov.uk/government/publications/fuel-poverty-2011-detailed-tables

127 For example, Green, G. and Gilbertson, J. (2008). *Warm Front Better Health: Health Impact Evaluation of the Warm Front Scheme*. CRESR; Wilkinson, P. et al (2001). *Cold Comfort: the social and environmental determinants of excess winter deaths in England, 1986-96*. Policy Press; The Eurowinter Group (1997). Cold exposure and winter mortality from ischaematic heart disease, cerebrovascular disease, respiratory disease, and all causes in warm and cold regions of Europe. *The Lancet*, 349, 1341-1346.

128 Liddell, C. and Morris, C. (2010).Fuel Poverty and Human Health: A Review of Recent Evidence'. *Energy Policy*, 38(6), 2987-2997.

252. The PRS Regulations will reduce the stock of low quality buildings, which should substantially reduce the number of people living and working in cold conditions. This is closely linked with the impact of the Regulations on Fuel Poverty – see Section 2.

Annexes

Annex A – Policy Coverage and Compliance

Exclusions

253. The PRS Regulations will only apply to those properties that require an Energy Performance Certificate (EPC). Exclusions for certain buildings are set out in the accompanying DCLG guidance documents[129] [130]. However the PRS regulations are proposed to apply where an EPC exists for the property and only part of the property is let (such as an individual room within an House in Multiple Occupation) on a PRS tenancy in scope, even though in this situation an obligation under the EPC regulations would not apply. The PRS regulations are also proposed to apply to listed buildings in possession of an EPC, where the installation of energy efficiency measures does not damage the fabric or character of the property.

254. Most of the exclusions from the PRS regulations will be confined to a very small percentage of the overall PRS stock. Two possible exceptions are homes in multiple occupation and listed buildings (see below).

Houses in Multiple Occupation (HMOs)

255. A property falls under the category of a Houses in Multiple Occupation if at least 3 tenants live in the property, forming more than 1 household[131], where the tenants share toilet, bathroom, or kitchen facilities with other tenants[132].

256. Official statistics suggest that around 400,000 domestic PRS properties in England and Wales fall under this definition of HMO, which means that they comprise around 10% of the PRS building stock's 4.2m premises[133]. Whether an HMO is required to obtain an EPC depends on the particular set-up of the property and/ or tenancy agreement[134]. Any HMO requires an EPC when it is bought or sold; however, rooms let on an individual basis within an HMO do not currently trigger a requirement for the property to have an EPC.

257. As there is no requirement to obtain an EPC on let of an individual room, many HMOs are unlikely to have an EPC, and are therefore unlikely to fall within scope of the PRS regulations.

Listed buildings and ancient monuments

258. Data on the number of listed buildings within the domestic PRS stock is not known. However, DCLG's impact assessment on the recast of the Energy Performance of Buildings Regulations[135] provides estimates of the

[129] Domestic sector guidance https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/307556/Improving_the_energy_efficiency_of_our_buildings_-_guide_for_the_marketing__sale_and_let_of_dwellings.pdf

[130] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/50268/A_guide_to_energy_performance_certificates_for_the_construction_sale_and_let_of_non-dwellings.pdf

[131] A household consists of either a single person or members of the same family who live together. It includes people who are married or living together and people in same-sex relationships.

[132] More details on how HMOs are defined can be found on the Government Website https://www.gov.uk/private-renting/houses-in-multiple-occupation

[133] Data on the number of HMOs in England can be found in the Housing Strategy Statistical Appendix http://data.gov.uk/dataset/england-hssa-housing-strategy-statistical-appendix# and figures for Wales can be found at StatsWales https://statswales.wales.gov.uk/Catalogue/Housing/Hazards-and-Licences/HousesInMultipleOccupation-by-Area

[134] Details on which HMOs are required to obtain an EPC, and which aren't, is contained within the DCLG's EPC Guidance https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/50816/A_guide_to_energy_performance_certificates_for_the_construction__sale_and_let_of_dwellings.pdf

[135] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/39379/Impact_Assessment.pdf

number of these building types. This reports that there are approximately 374,000 listed buildings in England, and notes that while "*listing a building is not the same as issuing a preservation order, this figure does give a proxy for the total number of buildings that come within the first category noted above, i.e. buildings officially protected as part of a designated environment or because of their special architectural or historic merit*" (page 8). As the IA also notes, a further 20,000 buildings are listed as ancient monuments. This implies that around 400,000 buildings may fall into the category of a listed building or ancient monument. Around 25% of these lie within the private domestic sector (equivalent to approximately 100,000 buildings).

259. Data on the tenure of these building types is not available. However, using the fact that the PRS comprises 18% of the total building stock in England and Wales as a proxy, and around two thirds of the stock are owner occupied this would suggest that around 22,000 properties in the PRS could be exempt from obtaining an EPC because they are either a listed building or ancient monument (of the 100,000 within the private domestic sector outlined in the IA above), some smaller proportion of these might be able to safely install energy efficiency measures. This represents less than 1% of the 4.2 million PRS properties in England and Wales.

260. Taking these exclusions into account, around 3.8m properties across the total PRS stock would be required to obtain an EPC.

Compliance costs to landlords

261. Landlords will face modest compliance costs, principally relating to understanding the Regulations and gathering necessary evidence relating to an exemption where one applies. Landlords may choose to incur other costs in complying with the regulations, for instance they might choose to seek legal advice, but the regulations and accompanying guidance are intended to be capable of being interpreted by a individuals without legal training. Landlords may also elect to install measures earlier, or install more measures than required.

Understanding the Regulations

262. Guidance on the Regulations for landlords will be issued following the laying of the secondary legislation. It is difficult to estimate how much time it will take landlords to understand the guidance. Understanding the guidance should be relatively quick in those cases where: letting agents read and summarise the guidance or advise landlords; or where the landlord's PRS property already has an EPC ratings of 'E' or higher, meaning they are already in compliance with the Regulations. For those without a valid EPC and who are due to take on new tenants, the process may take longer.

263. For the purposes of this IA it has been assumed that, on average, it will take landlords one hour to understand the Regulations. It has been further assumed, for simplicity, that the time will be incurred in the year prior to the Regulations coming into force i.e. in 2015. Using an average wage rate to represent the opportunity cost to landlords of reading and understanding the Regulations, this equates to £11.62 per hour per landlord[136].

264. As outlined in section 11, there are around 1.6 million domestic sector landlords within the UK. This implies a total present value cost of around £16.1m[137]. This will be an overestimate as just under half (43%) of domestic landlords use an agent and therefore such costs are likely to be borne by agents who will have economies of scale and consequentially are likely to bear lower costs.[138]

[136] This wage rate is based on the median gross hourly wage across all workers, according to the 2013 Annual Survey of Hours and Earnings http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcm%3A77-328216 . We have assumed no growth in nominal wages between 2013 and 2015.

[137] No data is available on the number of landlords owning domestic PRS properties in England and Wales, so this calculation (applying to all landlords in the whole of the UK) may be an over-estimate.

[138] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/7249/2010380.pdf

265. The number of non-domestic landlords is unknown. However, as noted earlier, there are around 1.8m commercial hereditaments in England and Wales, of which around 66% (by market value) are in the PRS. Using the conservative assumption that each landlord owns two properties, this implies there could be up to 600,000 commercial property landlords. It is likely however that there are far fewer landlords as the sector is dominated by larger entities with large portfolios (see Table 22). Commercial property landlords, however, may have to invest more time in understanding the implications of the Regulation for their commercial interests, so we have assumed it will take these individuals two hours to understand the Regulations. This suggests a total present value cost of around £13m (in net present value terms) for landlords to understand the Regulations. Similar to the domestic PRS, this is likely to be an overestimate as a large proportion of landlords are likely to use an agent.

266. The number of new landlords entering or leaving the market each year is unknown so no estimate has been made to reflect this. The number is, however, expected to be small.

Demonstrating exemption

267. In some instances, landlords owning properties with an EPC rating of lower than those stipulated under the PRS regulations, might find that no measure or combination of measures which meet the Golden Rule can take the property to the minimum level required. Landlords may also be refused necessary permissions in order to undertake improvements. The landlord is therefore temporarily exempt from meeting the minimum standard. The length of this temporary exemption will be five years, at which point the landlord must re-attempt to meet the standard through installing cost effective measures.

268. Consultation responses overwhelming supported mandatory Certification of exemptions, where a third party would examine the Landlords evidence for an exemption, and certify that the exemption is justified. Landlords would therefore be in breach if they let properties below the minimum standard without certification of an exemption. Without such certification there was concern that it would be difficult for local authorities to distinguish compliant, F or G EPC rated properties, from non-compliant. The Government believes that a light touch approach to third party verification of exemptions is appropriate.

269. If the exemption is related to the cost of the improvements, landlords would only need to obtain quotes for improvements from suppliers in order to consider whether such improvements had since become viable within the Golden Rule or seven year payback (through reductions in measure costs, available grants/subsidies or higher energy costs). If they do, the measures are installed and the landlord has complied with the regulations if the property reaches the minimum standard; if not, the landlord is awarded a five year temporary exemption.

Centralised notification

270. The regulations will require that landlords who consider they have an exemption to register it on a central database. The database would capture the details and evidence relating to the exemption. The process is not expected to be administratively burdensome. Landlords would only be required to register their exemption and upload associated evidence through a user friendly online portal. Where landlords use an agent, agents would likely undertake the process and are likely to benefit from economies of scale as agents will be managing multiple properties.

271. A landlord would need to notify their exemption before the property was let. Where a backstop applies (2020 for domestic landlords, 2023 for non-domestic landlords), a landlord would be expected to notify before the 1st April of the year in question. Landlords may also be required to provide the tenant a copy of their entry in the exemption database on letting of the property, alongside a copy of the EPC.

272. Where a landlord failed to notify their exemption and were found to be letting their property below an E, they could be issued with a penalty notice (although this would be at the discretion of the Local Authority). Likewise a landlord could be issued with a penalty notice where they knowingly provide false or misleading information when notifying their exemption.

273. To ensure that landlords are dissuaded from providing insufficient or false documentation on the database, a percentage of entries could be audited, by DECC, local authorities or a third party, with potential non-compliance cases passed to local authorities.

274. This IA does not make an estimate of exemption costs, for the reasons set out above (that is, they are expected to be very small). These costs are expected to be small in relation to the overall costs and benefits of the impact assessment.

Enforcement costs to local authorities

275. Local authorities will face costs in advising landlords and enforcing the Regulations. These costs are expected to be largely in the form of staff costs.

276. We received two consultation responses on the costs to local authorities. These indicated similar potential costs:

- Set up costs including training staff to develop knowledge on the regulations including funding options (e.g. Green Deal and ECO); and information campaigns of new legal duties to landlords
- Advising on the regulations
- Dealing with complaints and referrals as a result of these measures
- Investigating whether or not landlords are compliant
- Collating, reviewing and preparing evidence for cases
- Costs of cases and tribunals (in the case of appeal)

277. The responses also indicated that there would be costs for certifying temporary exemptions. In the final policy design these costs will be borne by central Government instead of local authorities in the form of a central database.

278. One consultation response included detailed figures which forms the basis of our estimates of local authority costs for England and Wales. The respondent indicated there would be a one-off set up cost of £7,500. This is for domestic PRS only.

279. In order to translate this cost into a cost to all local authorities across England and Wales as a whole, we took the estimated number of domestic PRS properties in that local authority to derive the cost of enforcing the regulations on a per property basis. We then scaled up this per property cost by the number of domestic PRS properties across England and Wales to arrive at the total costs to all local authorities in England and Wales of enforcing the Regulations

280. Under the final policy design, local authorities are also expected to enforce the non-domestic PRS. In order to capture the additional costs to local authorities of enforcing the non-domestic PRS, we used the domestic cost per property (as described above), and scaled up this cost by 50% to account for the extra complexity of (for example) inspecting properties in the non-domestic PRS. The cost per property was then scaled up by the number of properties in the non-domestic PRS to give the aggregate costs to local authorities of the non domestic PRS.

281. Combined, this gives a total one-off set-up cost across the domestic and non-domestic PRS of around £1m (present value) for England and Wales. It is assumed that the one-off cost will be incurred in 2017, the year prior to the introduction of the minimum energy efficiency standard.

282. A similar approach was adopted for annual costs. The respondent indicated an average annual cost of around £53,000 based on 0.5 FTE Housing Office; 1 Technical Officer; 0.1 Senior Officer. These are costs for an average year. It is expected that annual costs will be higher in the run to up the minimum energy efficient standard coming into force and the first few years after the policy has come into force – hence, we have assumed higher costs in these years. Total on-going costs to local authorities over the appraisal period of the IA are expected to be around £36.9m (present value). Total costs including one-off and on-going costs are estimated at £37.8m (present value) over the period of the IA.

Costs to Central Government (DECC)

283. The costs to central Government of the Regulations are expected to involve the costs of creating and maintaining a centralised database for landlords to lodge their temporary exemptions.

284. The costs to DECC of developing the centralised database will be determined by DECCs ability to leverage current IT development work (where the marginal cost of establishing a database will be low) versus the need to develop a stand-alone system. We have conservatively assumed that the database development costs relate to a broadly stand-alone system, and have used as a bench mark the cost of similar systems procured within DECC. Costs are expected to be determined by competitive tender, however these initial set-up costs have been estimated as £3.5m in 2016[139], the date the register would need to go 'live', to enable landlords wishing to act early under the minimum energy efficiency standards to pre-register.

285. There are also expected to be on-going staff costs associated to DECC in maintaining the database. While these staff costs are expected to vary over time, we have assumed that in the first few years of the regulations, they involve 1 FTE higher executive officer, overseen by a Grade 7 (0.1 FTE)[140].

[139] Our cost estimates are based on the costs DECC incurred in creating a register database for the Carbon Reduction Commitment Scheme. While this database is smaller than that proposed for the PRS Regulations, the database was more complex, so it was felt that this represented a good proxy for the cost DECC may incur in creating the proposed centralised database.

[140] The assumed staff costs of: £40,185 (higher executive officer), and £65,630 (Grade 7). These costs included national insurance and pension contributions. Staff costs are expected to be incurred throughout the appraisal period. However, they are expected to be highest during the first few years of the Regulations coming into force. Staff costs are expected to fall during the 2020s, with staff costs from 2030 onwards expected to represent around one fifth of an higher executive offer's time (0.2 FTE).

Annex B – Broad policy objectives

Reduce UK Greenhouse Gas (GHG) emissions

286. The Climate Change Act 2008 created a legal requirement for the Government to reduce UK GHG emissions by at least 80% by 2050 relative to 1990 levels. Within this overall target, the first three carbon budgets (2008-22) require GHG emissions to fall by at least 34% by 2020 relative to 1990 levels. The fourth carbon budget (2023-2027) requires at least a 50% reduction in emissions by 2025 relative to 1990 levels.

287. In 2009, buildings were responsible for 213 MtCO2e which was around 38% of the UK's total GHG emissions (of around 562MtCO2e). Within this, domestic buildings were responsible for around 25% of emissions and non-domestic buildings 12%[141]. Therefore, the UK's carbon budgets, and legally-binding 2050 carbon target, cannot be met without reductions in GHG emissions relating to buildings.

288. Meeting the UK's legally-binding target to reduce GHG emissions by 80% by 2050 should be achieved at the lowest cost to consumers, businesses and society. Improving the energy efficiency of buildings is one of the most cost effective ways of reducing emissions. DECC's recently-published Energy Efficiency Strategy[142] quantifies the cost effectiveness of energy efficiency. It shows that the installation of energy efficiency measures are among the most cost effective ways of reducing energy demand and abating carbon. The Energy Efficiency Strategy's Marginal Abatement Cost Curve shows that the installation of energy efficiency measures often has negative costs. This occurs due to the benefits of the installation of such measures outweighing their cost.

Increase security of energy supply

289. The UK is becoming increasingly dependent on fossil fuel imports, leaving the UK more exposed to risks from rising global demand, limitations on production and price volatility. UK production of oil and gas has fallen from 134% of national demand in 2000 to 71% of demand in 2010. Published projections show a further fall to 48% in 2020[143].

290. Maintaining security of supply against the backdrop of rising reliance on imports requires three complementary actions:

    i. Ensuring that the UK has strong, resilient markets and infrastructure
    ii. Securing our energy supplies through greater use of domestic supplies and managing our relationships with other countries
    iii. Reducing domestic demand for energy.

291. Increasing the energy efficiency of homes should help reduce energy demand and thus reduce our reliance on fossil fuels.

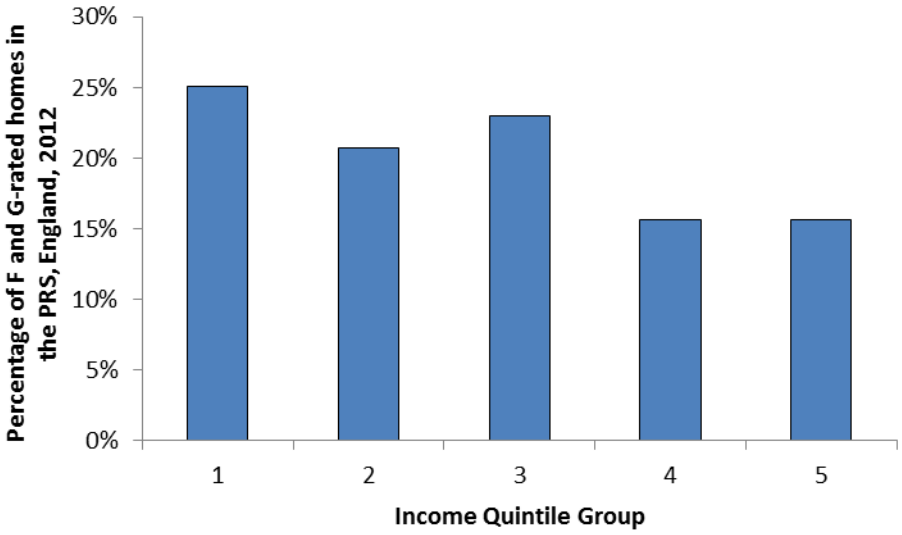
Address the drivers of fuel poverty

292. The barriers to improving standards in the least energy efficient properties in the PRS, outlined in Section 2.1, are compounded by equity concerns relating to the disproportionate share of F or G-rated PRS homes that are lived in by households on low incomes (see Figure 1, below). Households on lower incomes typically face the greatest trade-offs between using their constrained resources to adequately heat their homes and spending on other basic essentials, and those that face the overlapping challenges of living on a low income

[141] Source: The Carbon Plan. The statistics can be found here: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/139583/6119-methodology-to-derive-carbon-plan-headline-emissio.pdf (see emissions by end user).
[142] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/65602/6927-energy-efficiency-strategy--the-energy-efficiency.pdf
[143] Source: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/249323/production_projections.pdf

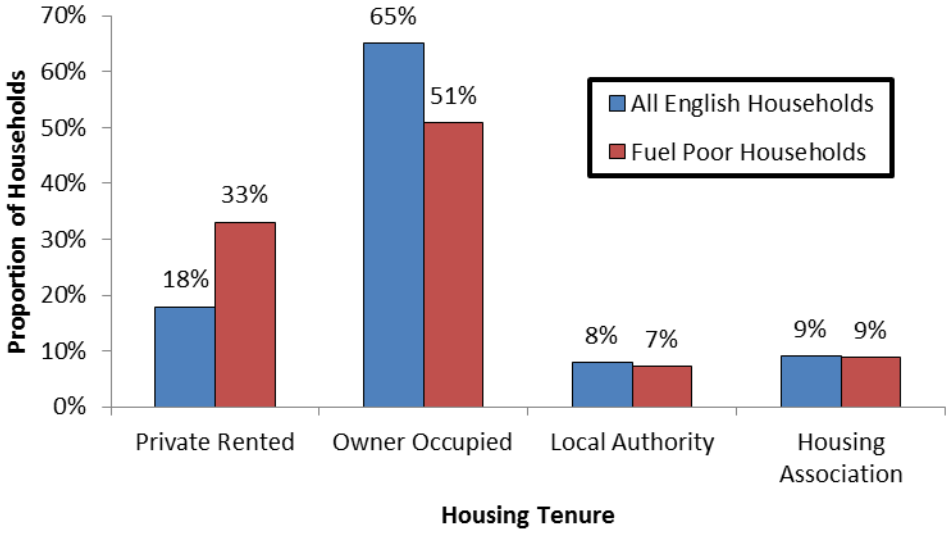
and facing high energy costs are defined as living in fuel poverty.[144] The Government's Strategic Framework for fuel poverty was published in July 2013[145], and showed that living in the PRS was an independent and significant risk factor for being in fuel poverty. This is illustrated in Figure 2, which shows the disproportionate share of fuel poor households in England that live in the PRS (33%) compared to the general population (18%).

Figure 1: Distribution of 'F'- or 'G'- rated households in the PRS, by income quintile group (England, 2012)



Source: Fuel Poverty Dataset, 2012 (EHS 2012)*
**From pooled 2011/12 and 2012/13 dataset to create larger sample size*

Figure 2: Distribution of fuel poor households versus all households across housing tenure (England, 2012)



Source: Fuel Poverty Dataset, 2012 (EHS 2012)*
**From pooled 2011/12 and 2012/13 dataset to create larger sample size*

293. The Fuel Poverty Strategic framework also set out a number of key principles for supporting the fuel poor – prioritising those facing the most severe problem, supporting them with cost-effective interventions, and ensuring policies reflect considerations of vulnerability. Fuel poor households facing the most severe

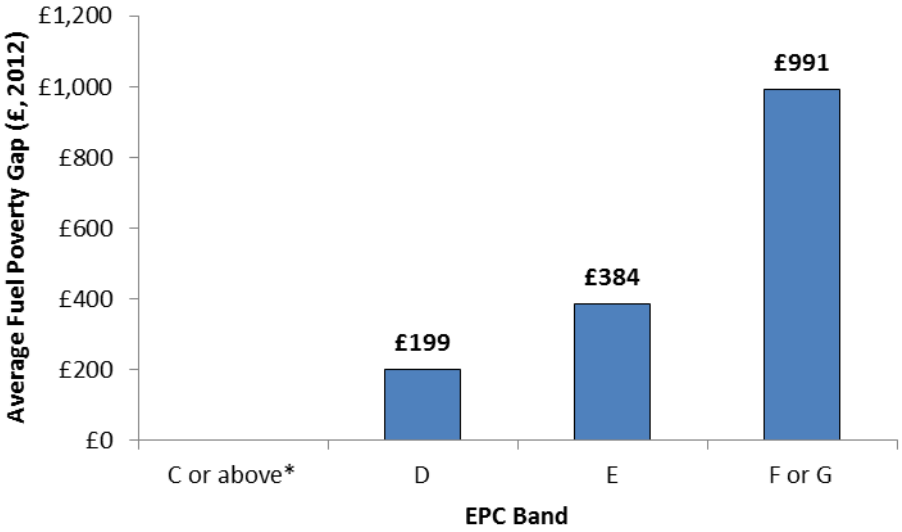
[144] England and Wales apply different definitions of fuel poverty – in England the Low Income, High Costs approach is applied, whereas in Wales a household is currently defined as being in fuel poverty if they would need to spend more than 10% of their income on energy to maintain an adequate heating regime. For more details see: https://www.gov.uk/government/consultations/fuel-poverty-changing-the-framework-for-measurement

[145] Available at: https://www.gov.uk/government/publications/fuel-poverty-a-framework-for-future-action

problem are typically defined according to their 'fuel poverty gap' – the energy costs they face above and beyond typical levels for their house type.[146]

294. Figure 3 shows the fuel poverty gaps for fuel poor households in the PRS in England, broken down by EPC-rating. There is a stark gradient, whereby those in the least efficient properties – in particular 'F'- and 'G'-rated PRS properties – face significantly larger fuel poverty gaps (and therefore to a large extent the most severe problem) than those in more efficient properties. The barriers to improving the efficiency of homes in PRS outlined in Section 2.1 imply that those fuel poor households facing some of the starkest trade-offs between keeping their homes adequately warm and spending on other essentials are effectively 'locked in' to this problem.

Figure 3: Average fuel poverty gaps for fuel poor households in the PRS, by EPC band (England, 2012)



*Source: Fuel Poverty Dataset, 2012 (EHS 2012**)*
** Small samples mean estimate is not shown.*
***From pooled 2011/12 and 2012/13 dataset to create larger sample size*

295. The independent Hills Fuel Poverty Review identified that poor domestic energy efficiency was a key driver of fuel poverty[147], and that improving the energy efficiency of fuel poor homes was the most cost-effective and sustainable way of alleviating the problem.[148] In principle, therefore, addressing the energy efficiency of PRS households should not only help address a root cause of fuel poverty, but also do so in a way that is in line with the principles set out in the Government's Strategic Framework.

296. The extent to which fuel poor households realise a reduction in their fuel costs from raising energy efficiency in the PRS is, however, dependent on the delivery mechanism used to drive these improvements. A mechanism whereby tenants fully or part-finance the cost of measures, for example through the Green Deal where repayments are made over time through a household's electricity bill, will to some extent offset fuel cost savings. This would also offset the extent to which a fuel poor household's fuel poverty gap is reduced from improvements in their energy efficiency.

297. However, a requirement for measures to meet the 'Golden Rule' under the Green Deal, as well as the right for households to refuse measures, should mean that fuel poor households taking up measures in the PRS will directly experience some level of fuel bill savings. This would also deliver an equivalent reduction in their fuel poverty gap. Further, alternative funding streams for low income households that fully subsidise or

[146] For more detail on the fuel poverty gap, please see: https://www.gov.uk/government/publications/fuel-poverty-a-framework-for-future-action
[147] Hills (2011). *Fuel Poverty: The Problem and Its Measurement*. Available at: http://sticerd.lse.ac.uk/dps/case/cr/CASEreport69_Executive_Summary.pdf
[148] Hills (2012). *Getting the measure of fuel poverty*. Available: http://sticerd.lse.ac.uk/dps/case/cr/CASEreport72.pdf

cover a proportion of the upfront cost improvements without requiring repayments, such as Local Authority grants or the Affordable Warmth element of the ECO, would mean that PRS households would benefit fully from reductions in their energy costs. In addition, regardless of delivery mechanism, improvements in the energy efficiency of PRS homes should also drive a higher level of thermal comfort resulting in positive health effects (see Section 2).

298. As a result of energy efficiency-driven reductions in energy costs (particularly once any Green Deal repayments are completed), landlords may have the incentive to capture the benefits of these lower energy costs by increasing the rent charged to their tenants. Were this to be the case, households living in the PRS could face a reduction in their disposable income as a greater share of their resources go towards paying rent, potentially increasing their risk of falling into fuel poverty.[149] However, as highlighted in Section 2.1 above, there are significant informational barriers to rent payments increasing in this way; and were Landlords able to overcome these barriers, market pressures would limit any ability to increase rents beyond any fuel bill savings tenants may experience.

Improving tenant health

299. Living at low temperatures poses a risk to health, with a range of negative morbidity and mortality impacts. The Marmot Review Team report on cold homes and health[150] and the Hills Fuel Poverty Review[151] set out the strong body of evidence linking low temperatures to these poor health outcomes – in particular the cardiovascular and respiratory illnesses that drive the number of excess winter deaths each year.

300. Poor energy efficiency standards, and high energy costs driven by poor energy efficiency, have been shown to be linked to lower indoor temperatures[152]. The English Housing Survey Energy Follow Up Survey also shows a clear correlation between low energy efficiency, and low average dwelling temperatures during the winter heating season (Figure 4). Households in the PRS facing the barriers to upgrading the efficiency (outlined in Section 2) therefore risk being 'locked in' to low temperatures and the subsequent negative health outcomes.

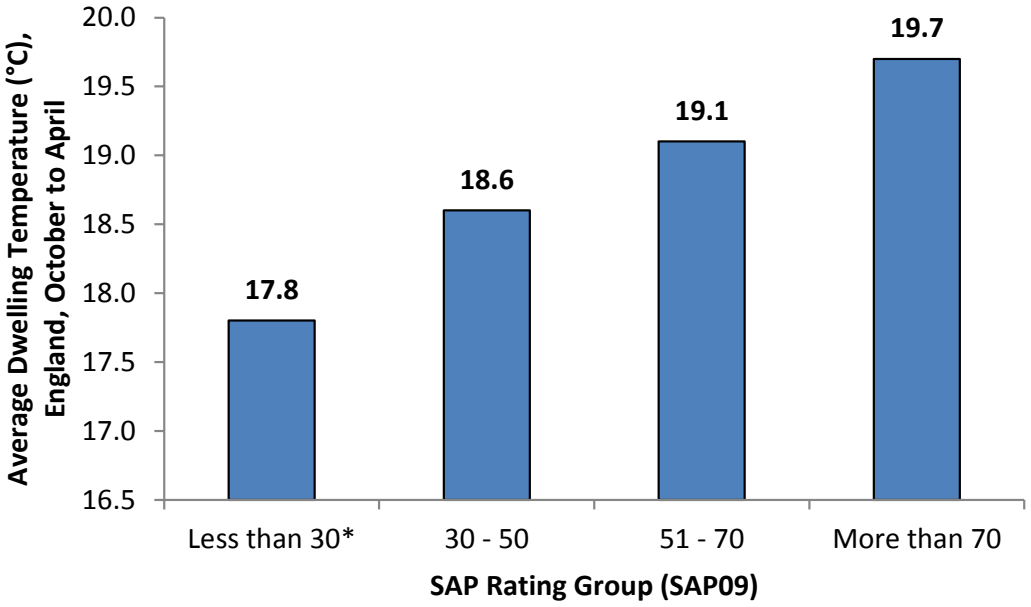
[149] 'Low income', as defined under the Low, Income High Costs definition of fuel poverty in England, is measured 'after housing costs' such that an increase in rent a household has to pay would be reflected as a reduction in income, thereby increasing the likelihood of a household living in an F or G-rated home in the PRS falling into fuel poverty (i.e. facing both high costs from living in an inefficient dwelling *and* being in a low income).

[150] Marmot Review Team (2011). *The Health Impacts of Cold Homes and Fuel Poverty*. Available at: http://www.instituteofhealthequity.org/projects/the-health-impacts-of-cold-homes-and-fuel-poverty

[151] Hills (2011). *Fuel Poverty: The Problem and Its Measurement*. Available at: http://sticerd.lse.ac.uk/dps/case/cr/CASEreport69_Executive_Summary.pdf

[152] See Wilkinson et al (2001). *Cold Comfort: the social and environmental determinants of excess winter deaths in England, 1986-96*.

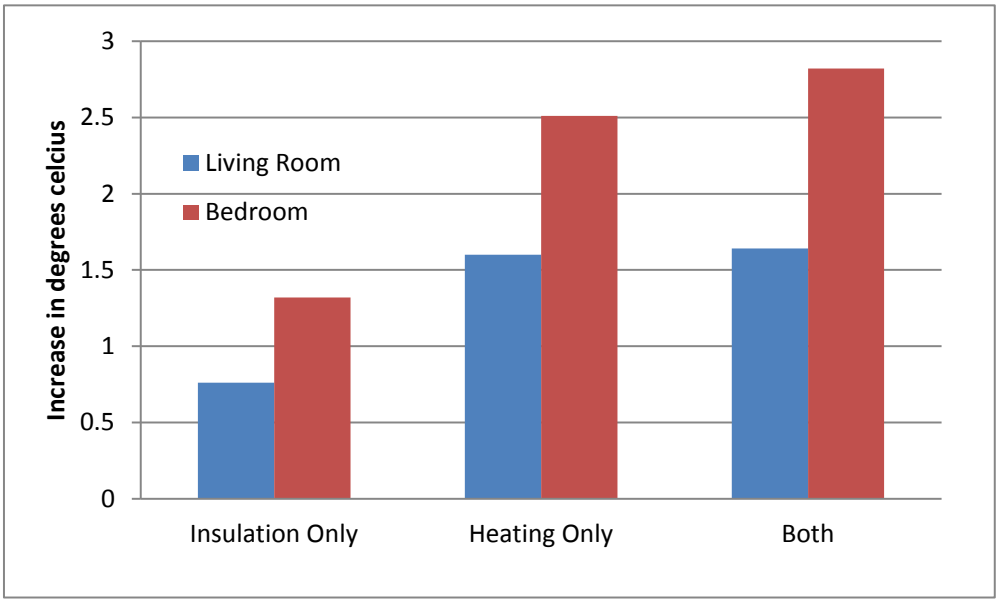
***Figure 4: Average dwelling temperatures during winter heating season, by SAP rating* band**



Source: English Housing Survey Energy Follow Up Survey[153]
** Small samples mean potentially high sampling errors*

301. Improving the energy efficiency of homes has been demonstrated to improve indoor temperatures significantly, with the implication of reduced health risks as a consequence. The evaluation of the Warm Front scheme in 2008 monitored the impact of heating and insulation improvements on indoor temperatures, demonstrating the significant effect that energy efficiency interventions can have on indoor comfort levels (Figure 5).

Figure 5: Estimated change in standardised temperature following efficiency improvements under Warm Front



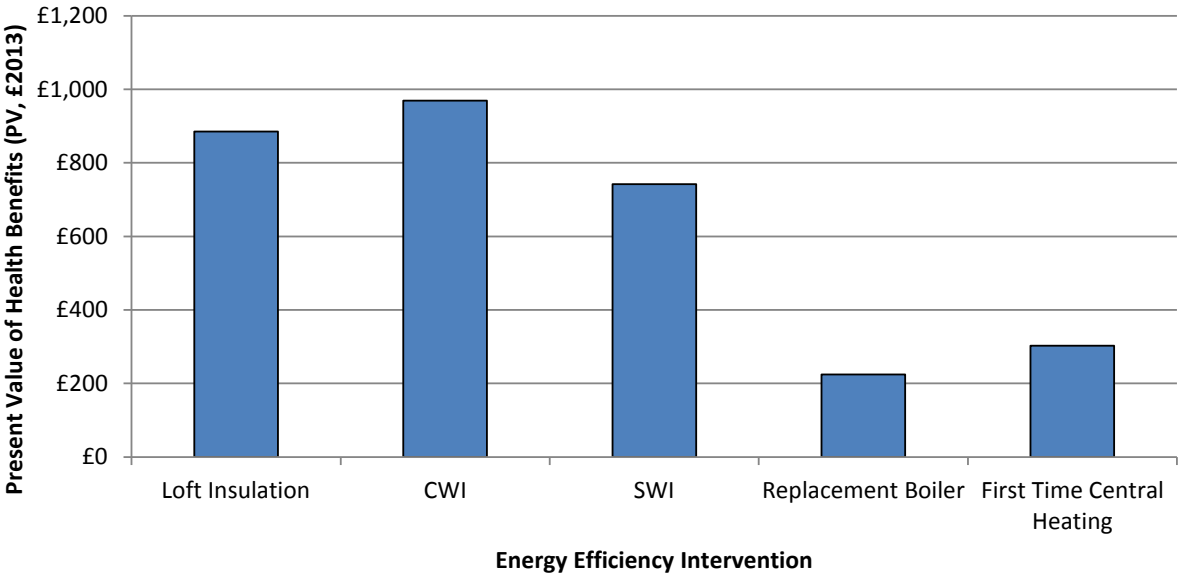
Source: Green and Gilbertson (2008)[154]

[153] 2011 Energy Follow Up Survey Temperature Report, available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/274770/2_Mean_Household_Temperatures.pdf

[154] Green, G. and Gilbertson, J. (2008). *Warm Front, Better Health*. Available at: http://www.apho.org.uk/resource/view.aspx?RID=53281

302. In terms of the health improvements associated with specific energy efficiency interventions, DECC has been developing a methodology to estimate and quantify the change in Quality Adjusted Life Years (QALYs) – an official measure of health outcomes. Estimates of the value of individual interventions in terms of their impact of improved health outcomes were published in the July 2013 Fuel Poverty Strategic Framework, demonstrating the potential benefits to society (per measure) from improving the energy efficiency of homes (Figure 9). The potential benefits of health improvements from energy efficiency interventions could in some instances, for example low cost loft insulation, even outweigh the cost of installation.

Figure 9: Estimated value of lifetime health benefits per energy efficiency improvement (2013 prices)



Source: Fuel Poverty Strategic Framework (2013)[155]

[155] Available at: https://www.gov.uk/government/publications/fuel-poverty-a-framework-for-future-action

Annex C – Assumptions, Risks and Uncertainties

ECO policy

303. There are a number of key interdependencies between the PRS Regulations and the Energy Company Obligation (ECO). In particular, the presence of the ECO subsidies offers the possibility of blended packages of measures including more costly technologies such as solid wall insulation. The price of ECO points affects the amount of ECO subsidy available to households. Reducing the price of ECO will cut the number of households installing more costly measures, as they may not meet the Golden Rule. Increasing ECO will raise this number of households.

304. Recently proposed changes to the ECO policy mean that, from March 2014, more low cost measures will qualify for ECO support. These include easy-to-treat cavity wall insulation, and loft insulation. If agreed, this would increase the likelihood of more PRS properties achieving an EPC of E whilst meeting the Golden Rule.

Green Deal finance

305. This IA assumes households will be able to access Green Deal Finance, or other means of financing energy efficiency improvements if that is preferred. The only exception to this is where households have a poor credit history (see below).

Availability of non-domestic GD finance

306. GD finance is not currently available in the non-domestic sector although it is the intention of the Green Deal Finance Company to offer finance in the future, and other companies may be interested to offer finance in the sector as well.

Green Deal Credit Length

307. The credit length associated with a Green Deal Package will vary depending on the type of measures installed. Given the widespread heterogeneity of credit lengths, we have made the simplifying assumption that the credit length is 15 years for properties in the domestic PRS and 10 years for properties in the non-domestic PRS. This reflects the different lifetimes of the likely measures to be installed between the two sectors.

Exclusions

308. As discussed in Annex A, data on the number of properties that are not required to obtain an EPC and therefore do not need to comply with the regulation is not available. To account for these exclusions, 10% of the building stock was removed from the modelling.

Scotland

309. PRS Primary legislation is applicable to England and Wales only; Scotland is proposing separate legislation on improving energy efficiency for its privately rented properties. Our modelling data is therefore for England and Wales PRS building stock only.

Poor Credit Rating of Tenants

310. The ability to obtain Green Deal Finance depends on the tenant having a sufficiently good credit rating. It is estimated that around 20% of those applying for domestic Green Deal Finance will not be able to obtain finance due to their poor credit history. To account for this, we have reduced the building stock by 20% to account for those tenants with poor credit ratings. However where the landlord undertakes improvements during a void period (where there is no tenant in situ) an assessment is made by the landlord. Landlords are

likely to have on average a better credit rating than tenants and therefore it is likely that there will be a lower failure rate when a landlord undertakes a Green Deal in a void period.

311. The lending criteria within the non-domestic Green Deal Finance are yet to be established. As a result, we have not reduced the availability of non-domestic Green Deal finance.

Proportion of the non-domestic building stock that is within the PRS

312. While we know there are around 1.8 million hereditaments in the non-domestic sector, it is unclear how many of these buildings belong in the PRS. Estimates from the Investment Property Databank (IPD) and British Property Federation (BPF) provide estimates of between 21% and 66%, depending on whether you measure the proportion by floor space or by property market value, respectively. For the purposes of this impact assessment, we have assumed the latter.

Non-domestic lease lengths against periods of occupation

313. Data is not available on length of occupation in the non-domestic sector so we have used lease length as a proxy. Periods of occupation are expected to be longer than the length of lease initially offered and this impacts the frequency in which the model applies the regulations to properties in the non-domestic PRS stock.

Representative nature of the non-domestic EPC data

314. Information drawn from the non-domestic EPC register provides a breakdown of EPC ratings for all properties that have lodged an EPC. This includes rented and owner occupied property. Due to a lack of data specifically on the profile of PRS properties, we have assumed that the profile of EPC ratings in the EPC register applies to the PRS stock.

EPC and PRS Compliance Rates

315. In the absence of robust data on the levels of compliance with the EPC Regulations, which require the provision of an EPC on letting a property, we have followed standard practice and assumed full compliance with the legislation.

Grants/incentives schemes

316. Where local authority, devolved, or nationally available grants are made available that could help landlords reach the minimum standard (EPC E rating), such funding sources would need to be taken into account by landlords trying to reach the minimum standard. The availability of these schemes will vary in time and location and therefore we have not taken these into account in our modelling.

Interest rate included in the 7 year payback test

317. As outlined in Section 4.4.5, the 7 year payback test in the non-domestic PRS will be linked to the Bank of England's base rate.

318. The non-domestic model only allows us to include a single interest rate when testing whether packages of measures pay back within 7 years. Consequently, we applied a Bank of England base rate of 2%, representing the market expectations of what the base rate will be from 2018-2020, according to the Office for Budget Responsibility[156].

[156] See: http://budgetresponsibility.org.uk/economic-fiscal-outlook-december-2014/. An average of this period represents the period during which landlords owning non-domestic properties will be required to make energy efficiency improvements.

Annex D – Current main funding mechanisms available to domestic landlords

319. From 2013, two additional funding mechanisms have been available to help finance energy efficiency improvements in the domestic property stock: the Green Deal and the Energy Company Obligation (ECO).

320. **The Green Deal**, launched in January 2013, is a financing mechanism and a framework of advice, assurance and accreditation for the energy efficiency supply chain for homes and businesses. It enables the installation of energy efficiency improvements at little or no upfront costs, with payments recouped through customers' energy bills. A key facet of Green Deal finance is the Golden Rule, which states that Green Deal credit repayments should be no more than the estimated fuel bill savings as a result of making energy efficient improvements recommended within the Green Deal Advice Report. The aim is for the Green Deal and ECO (see below) to work together to address market failures and barriers in the energy efficiency market, with ECO providing additional support to delivery measures that will not be fully financeable through the Green Deal, and subsidised measures to low income and vulnerable households.

321. Green Deal finance is not currently offered for non-domestic properties, although assessments are available. The Green Deal Finance Company intends to make such finance available and other finance providers may also offer such finance.

322. **ECO** originally came into force on 1st January 2013 and places a legal obligation on obligated energy suppliers to meet carbon saving and heating cost reduction targets in the domestic sector by March 2015.

323. In 2014, the Government consulted on changes to the existing ECO and an extension of the scheme beyond its current March 2015 end date, to March 2017[157]. The impact of these changes can be found in the IA that accompanied the Government Response[158].

324. As a result of ECO, energy efficiency measures in the domestic sector can be subsidised for qualifying households installing ECO-eligible measures. ECO will be available to many domestic PRS landlords, allowing them to increase energy efficiency of their properties at a lower cost.

Other domestic energy efficiency Incentives

325. As well as outlining changes to ECO, the 2013 Autumn Statement announced that £540 million would be made available over the next three years to boost energy efficiency. £450 million of this would be aimed at households and private landlords. The Green Deal Home Improvement Fund was the first incentive scheme using the funding announced in the Autumn Statement. Future funding incentive schemes will build on this approach. In general, these incentive schemes will have 2 key effects: (i) encouraging investment to be brought forward, and measures installed early than they would have otherwise; and (ii) increasing the overall investment in the building sector. However due to the evolving nature of the incentives, the Impact Assessment has modelled only the first of these effects, and has changed the profile of adoption of measures, bringing them forward. Modelling the impact of the incentive scheme on the uptake of energy efficiency measures is a separate policy and therefore beyond the scope of this IA.

[157] https://www.gov.uk/government/consultations/the-future-of-the-energy-company-obligation

[158] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/373650/ECO_IA_with_SoS_e-sigf_v2.pdf

Annex E– National Household Model

Model Overview

326. The National Household Model assesses the potential impact of the PRS Regulations. The model estimates the impact of the Regulations by assessing the PRS housing stock, their exposure to the Regulations and the changes to the stock that will result from compliance with the Regulations.

327. The NHM is used to provide projections for the take-up of most energy efficiency measures recommended in household EPCs and Green Deal assessments. It assesses the possible impact the energy efficiency measures would have on different types of housing. It then determines the most cost-effective package of measures each housing type would need to install in order to reach an E rating, and considers whether this meets the Golden Rule and 'no upfront cost to landlords' constraints. For those households that cannot reach the minimum standard, it assumes measures are taken up that still improve their energy efficiency within the Golden Rule constraint. The Golden Rule assessment includes ECO support for those that qualify for a primary ECO measure and are offered ECO support as per the model assumptions. Costs and benefits calculated include installation costs, carbon savings and energy savings.

F&G Rated PRS Housing Stock

328. The initial stock of PRS households with an EPC rating of F and G has been derived using the English Housing Survey 2010, Living in Wales 2008, uprated to 2010 levels using Welsh National Assembly Statistics. This stock is categorised into 3,509 archetypes according around 100 property characteristics. These include:

i. type of property (eg. detached/semi-detached/terraced house or flat);
ii. heating fuel;
iii. heating technology;
iv. wall type (solid wall or cavity, including whether insulation has already been installed);
v. thickness of existing loft insulation; and
vi. presence of existing measures.

Potential EPCs

329. In order to provide an EPC score before and after a measure is installed, the model simulates a post-measure EPC on each property. This includes the following steps:

i. Determine the suitability of each home to the range of the energy efficiency measures.

ii. For each of the suitable measures the following are calculated:
   i. energy savings (kWh)[159];
   ii. energy bill savings (£);
   iii. traded and non-traded CO2 savings;
   iv. Golden Rule savings; and
   v. the amount of ECO subsidy offered[160].

iii. Each of the measures is applied in order to see the cumulative effect of their installation on the SAP score/EPC rating of the property.

iv. Determine which measure(s) the property needs to install to get to an E rating, or whether it is not possible to get to an E rating (i.e. by installing all measures)

[159] Energy savings are calculated within the NHM using SAP 2009 methodology.
[160] The value of ECO available for each tonne of CO2 abated is provided by the Green Deal Household Model.

v. Assess cumulative packages of measures to see the furthest point that the home can get to within the Golden Rule for a Green Deal Finance Plan[161].

Compliance and Take-up/Installation

330. In order to model the take-up rate of packages, a trajectory of exposure of PRS F or G homes to the PRS Regulations is assumed. The trajectory in the preferred policy option is based on:

i. A 2016 start to the tenants' rights; a 2018 start to the minimum energy efficiency standards, with exposure/take-up beginning in 2014 and reaching 100% of non-excluded F&G PRS stock by 2020 (when the regulatory backstop is assumed to take effect).

ii. The composition of compliance/take-up in each year being representative of the composition of the starting PRS F&G stock.

iii. Full compliance of those exposed to, and covered by, the Regulations each year is assumed. How they comply depends on the characteristics of the house archetype: each archetype falls into one of three categories and all homes of the same archetype are assumed to take the same action (including installing the same package of measures at the same costs, savings, etc.)

iv. A home installing all measures within the largest package that meets the Golden Rule / Green Deal Finance Plan that achieves an EPC E rating (from 2018), or as close as possible to that rating if they cannot get to an E

v. Households for whom no improvements meet the Golden Rule do not take any action.

Counterfactual

331. The profile of take up in the counterfactual has been determined from modelling in the Green Deal Household Model (GDHM). ECO is included within the counterfactual until 2022. After 2022 when no ECO support is offered, fewer properties are assumed to make energy efficiency improvements, with the rate of uptake derived by removing the impact of ECO for the period to 2022 linearly extrapolated to 2065.

332. As outlined in Section 6, the counterfactual also reduces uptake, due to the additionality of measures installed falling over time[162].

Model Limitations

333. All dwellings within a single archetype do the same thing – they will all install the same measures and incur the same costs. This is mitigated by having a maximum number of 400 dwellings within each archetype.

334. The model assumes that landlords or tenants will act rationally, and try to limit their capital costs to limit a loan size. However, more complex behaviours are not modelled. For example, a householder may choose a more expensive, less effective insulation measure for cosmetic reasons.

Energy Efficiency Measures

335. The energy efficiency measures included in the model are a consolidated list of those that could potentially be recommended on a domestic EPC. They are assessed in packages:

[161] The package of measures required to get to an E. It assumes that households stop at the first measure that will get them to this point, so D and above ratings are only achieved if the last measure takes them from an F to a D or better.

[162] That is, that an increasing number of these measures would have been installed even in the absence of the Regulations – hence these should not all be classified as additional.

1. Loft insulation
2. Cavity wall insulation
3. Hot water cylinder insulation
4. Draught proofing
5. Low energy lights
6. Cylinder thermostat
7. Heating controls
8. Upgrade to condensing gas boiler
9. New/replacement storage heaters
10. Replacement warm air unit
11. Double/secondary glazing
12. Solid wall insulation
13. Floor insulation
14. Condensing oil boiler

Housing Stock

336. As outlined in Section 4, the PRS Regulations only apply to England and Wales. The NHM's building stock has therefore been adjusted, with the building stock for Scotland and Northern Ireland removed, for the purposes of modelling the Regulations.

337. The NHM's English housing stock is derived from the English Housing Survey 2010. The data from this survey has allowed us to break down the English housing stock into around 3,500 unique PRS property types, defined by their size, heating fuel, wall type and existing level of insulation.

338. The Welsh housing stock is partially based on a combination of the data from the Welsh National Assembly on the volume of domestic PRS housing stock in 2010 and the Living in Wales (2008) survey - the latter contains details on Welsh housing characteristics. This Welsh survey does not, however, contain the same level of detail as the English equivalent – hence a matching exercise was undertaken, whereby the reported characteristics of the Welsh housing stock were matched to their nearest equivalent in England. The additional housing characteristics reported in the English housing survey were then mapped onto the Welsh housing stock to give a more detailed assessment of latter's stock. While this means the Welsh housing stock uses some property characteristics from English survey data, the matching exercise should ensure it is representative of the Welsh housing stock as a whole.

339. As these housing stock surveys were undertaken between 2008 and 2010, the English and Welsh housing stock has been adjusted to take into account for changes in the size of housing stock, as well as any change in the technical potential that may have occurred since the surveys were undertaken.

Annex F - The Non-Domestic Private Rental Sector Model

Model Overview

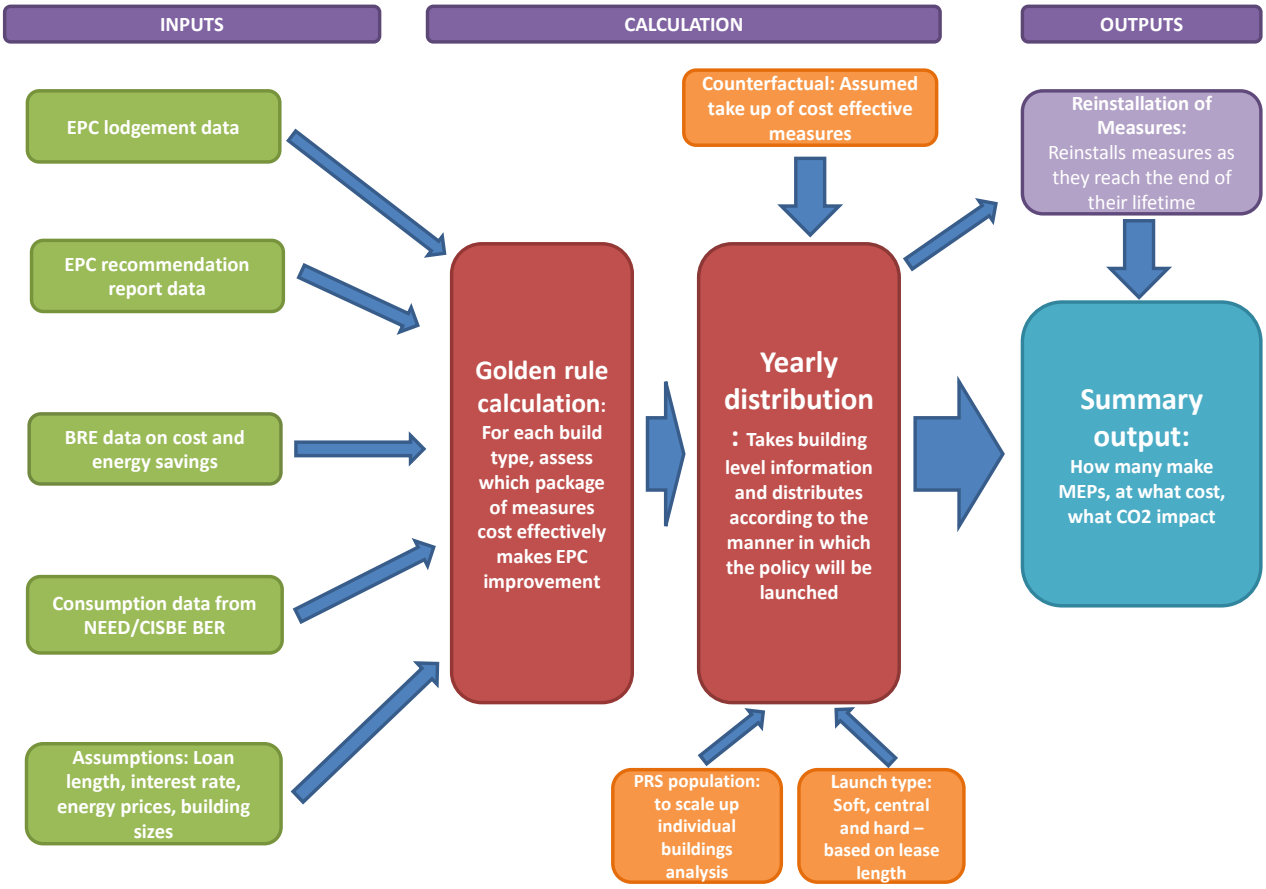
340. The Non-Domestic PRS (ND PRS) model estimates the uptake of cost-effective energy efficiency measures throughout the non-domestic private rental sector. It defines a mix of premises typologies within the non-domestic PRS and allocates cost-effective measures to these different premises, based on a combination of EPC recommendations for those premises and data from a variety of sources.

341. The model contains the following key steps in its construction:

i. EPC data: non-domestic EPC data –containing premises' SBEM[163] ratings is used to provide information on a building's use, its floor area and the recommended measures that could be installed to improve its energy efficiency (and the speed of payback of such measures). A potential EPC rating is not available within non-domestic EPCs;
ii. Energy use: estimates for buildings' energy use are calculated based on Chartered Institute of Building Services Engineers (CIBSE)[164] energy benchmark analysis and the EPCs' Building Emissions Rate (BER);
iii. Typology: premises are split into different typologies based on their use, their current SBEM rating, their size and the package of recommended measures;
iv. Cost information: BRE analysis provides information on the cost and/or energy saving potential of the recommended measures;
v. Potential: based on costs and energy saving potential of the recommended measures, the potential improvement for each premises' group that meets the Golden Rule is determined, along with the amount of energy likely to be saved;
vi. New EPC: a proportionate improvement on KWh energy consumption is applied to the EPC rating to determine the new EPC for those premises in the different groups that undertake energy efficiency measures; and
vii. Regulatory costs: the likely costs of PRS Regulations and their timing are calculated. This is based on lease length information of how quickly new tenancies would trigger improvement before a regulatory back-stop.

342. The diagram below illustrates how this methodology generates the overall impact of the proposed Regulations for 'F' or 'G' rated non-domestic hereditaments.

[163] SBEM: Simplified Building Energy Model – A software tool developed by BRE (The Building Research Establishment) that provides an analysis of a building's energy consumption. It is used for non-domestic buildings. The SBEM rating is used to determine the premises' EPC rating. A minority of properties will use dynamic simulation rather than SBEM.
[164] For more details, see www.cibse.org.



Non-domestic Stock

343. The ND PRS model assumes that the distribution of building characteristics across non-domestic building types is the same between PRS and non-PRS. Figure 3 in Section 1 shows the distribution of EPC data on all non-domestic properties, which is applied to the PRS stock.

344. The EPC distribution data is combined above with the 2013 BPF/IPD property data report which found that 66% of all commercial properties are rented. Annex ***Table 1*** shows how the model distributes these hereditaments across different uses.

Annex Table 1: Non-Domestic F and G rated premises

Build type	EPC count	National (all)	National (PRS)
Community/day centre	1,247	5,428	3,583
Education buildings	1,307	5,690	3,755
Health care buildings	3,558	15,489	10,224
Hotel	1,790	7,792	5,143
General industrial buildings	6,016	26,189	17,285
Office	46,930	204,295	134,836
Others	290	1,262	833
Restaurant and drinking establishment	18,733	81,548	53,823
Retail and financial services	46,663	203,132	134,067
Residential institutions	856	3,726	2,460
Sports and leisure	1,221	5,315	3,506
Transport terminals	92	400	266
Warehouse and storage	19,948	86,837	57,313
Total	148,651	635,801	419,633

Aggregating data

345. The EPC lodgements are grouped into four characteristics: build type, size, current EPC and main heating fuel. These characteristics form the basis of analysis within the ND PRS model, which splits premises into 351 distinct types: 13 main building types split into three sizes (small, medium and large) and three fuel types (gas, electric and oil). These types cover over 96% of all EPC registered buildings, before a final split into two current EPC ratings ('G' or 'F').

Potential EPC calculation

346. The building emissions rate of each EPC (a value included in each lodgement) is used to approximate the current energy use for each building archetype. This, combined with the estimated energy savings from the measures taken up, provides a figure for the potential EPC value for the premises after the energy efficiency measure(s) has been applied.

Recommended measures

347. For each of the EPC lodgements, there is an equivalent EPC recommendation report which categorises the list of available measures that would improve the energy efficiency of the building. The type of measures recommended varies by the property types when these are grouped to the level described above (physical activity, size, main heating fuel and current EPC). However, we construct a 'typical' suite of recommended measures based on a frequency count of the most popular packages recommended for each aggregated build type.

348. This analysis creates 63 possible permutations of packaged measures. It then determines the most cost-effective way in which the minimum energy efficiency standard can be achieved, and then selects the chosen package of measures required to be installed.

349. Most EPCs recommend lighting measures with an assumed five year lifetime. When bundled with cost-effective Green Deal packages (within the model), this would limit the lifetime of the plan to five years. This makes it less likely that higher cost, longer life measures are to be included in a package and meet the Golden Rule. This is because the total credit period of repayment cannot exceed the life of the measures to which it is paying off. A model adjustment was made to assume that all those with lighting measures will reinstall after five years. This has the effect of doubling the costs of lighting (in net terms), but allows a greater number of other measures to be meet the Golden Rule on a 10 year plan.

Costing of typical measures

350. Cost estimates are based on external advice from BRE. BRE categorises the cost estimates and energy saving potential from 32 commonly recommended energy efficiency measures, across the 13 major build types specified above.

Energy savings from measures and new EPC rating

351. The model determines the impact of the chosen package of measures in the following way. The chosen package of measures deemed to be cost-effective, and in particular meeting the Golden Rule, will deliver a reduction in the original KWh energy use of each aggregated build type. This proportionate reduction in energy use is used as a direct proxy indicator to suggest the same proportionate improvement on EPC classification, so that a 30% reduction in KWh energy use creates a 30% improvement in the SBEM classification score feeding into a new EPC rating.

352. In some cases, this methodology creates very high reductions to KWh energy use in our model. This could be down to one or both of the following factors:

- The model underestimates the true original energy use of certain buildings
- The estimated KWh improvements of certain measures are optimistic

353. To overcome this discrepancy, the model contains a maximum improvement ratio of 63% so that any package of measures can only improve the SBEM value by a maximum of 63%. This value has been determined by considering the average KWh improvement across each build type that would occur if all six recommended measures were installed.

Analytical Assumptions

Green Deal mechanism

354. The ND PRS model has been built to replicate how Green Deal credit is currently offered in the domestic sector. Dependant on the businesses' access to capital, energy efficiency measures can be financed in a variety of ways. Businesses will search for a competitive repayment interest rate, or consider self-financing the cost of measures upfront. For the purpose of our modelling, however, the assumed repayment offer in the non-domestic sector will replicate the current Green Deal finance mechanism. This will provide a useful proxy indicator for the cost-effectiveness of each package of energy efficiency measures that is considered.

Alternative finance test

355. As outlined in Section 4, an alternative payback test is to be offered in the non-domestic PRS. Modelling the uptake of energy efficiency measures that pay back within 7 years is carried out in a similar way to the Green Deal 'Golden Rule' test, but ensuring that the measure pays back within 7 years, and replacing the Green Deal interest rate with the Bank of England's Base Rate.

356. Should a measure be installed under this alternative finance test, financing costs are added to the overall costs of installing the measure. The interest rate assumed on the loan is the Bank of England Base Rate.

Interest rate and charges

357. The assumed interest rate within the model is either 6.96 % for Green Deal finance or the Bank of England Base Rate for calculating whether measure pay back in 7 years for the alternative payback test. This is consistent with the current interest rate offered by the Green Deal Finance Company (GDFC) for the domestic sector. Further charges assumed include an upfront fee of £63 to set up the credit mechanism, and a further annual £20 administrative charge on the credit. These cost assumptions are likely to result in a conservative estimate of costs, as some non-domestic landlords could have access to lower cost finance without the Green Deal finance upfront and annual charges.

Compliance

358. The ND PRS models two types of compliance: compliance with an EPC, and compliance with the PRS Regulations themselves. For the purpose of modelling (and consistent with all other modelling in this IA), 100 % compliance is assumed throughout. That is, in the central scenario where all landlords who become exposed to the Regulations from 2018[165] (when sitting tenants move out and a new one is tenancy is to begin) all will comply with the Regulations unless they are exempt. It has been assumed that 10% of landlords will be exempt, as they own a building with some form of restriction.

Constant pricing

[165] Note that while the Regulations come into force from 2018, some landlords are assumed to act early (from 2016) in complying with the Regulations. Uptake therefore begins from 2018.

359. The installation costs provided by BRE are held constant in 2013 prices, while energy prices for 2018 (in 2013 prices) are used to calculate the Golden Rule. The entire ND PRS model provides a snap shot consideration of the non-domestic sector, facing current energy prices and installation costs. Currently, the policy will require proportions of the stock to comply in later years – however, the model explicitly assumes that those buildings will face the same installation costs and energy prices i.e. that the relationship between installation costs and energy prices is constant.

Non-domestic lease lengths

360. According to the British Property Foundation[166], the average length of new leases has been falling, and is currently considered to be on average 4.8 years in the commercial sector. Further evidence on lease lengths from the BPF/IPD Annual Lease Review[167] shows the distribution of lease lengths (see table below). This distribution forms the basis of the scenario modelling to determine the speed of take-up in the different policy options.

Annex Table 2: Non Domestic PRS Lease Lengths

Lease length	***Rent-weighted distribution***
1-5 years	44.0%
6-10 years	26.5%
11-15 years	11.0%
16-20 years	4.5%
21+	14.0%

Source: BPF/IPD

Build types

361. All EPC data is compressed into identifying circa 350 representative buildings, each with unique characteristics based around main fuel use, current EPC rating, size and building use. Each building has a size based on the median of all observed lodgements pertaining to that particular characteristic, alongside a median asset rating, and energy consumption level. The model assumes that all buildings with this unique suite of characteristics (so, a small gas fuelled 'G' rated office) will benefit equally from the package of measures that is selected by the model.

[166] 2013 report http://www.bpf.org.uk/en/files/reita_files/property_data/BPF_Property_Data_booklet_2013_spreads_web.pdf

[167] 2012 report http://www.bpf.org.uk/en/files/bpf_documents/commercial/BPF_IPD_Annual_Lease_Review_2012.pdf

Annex G – Justice Impact

In brief, what is your proposal?

362. The following information relates to the compliance and appeals process for The Energy Efficiency (Private Rented Property) (England and Wales) Regulations. The regulations include for the domestic private rented sector the provision for a tenant to reasonably request consent for energy efficiency measures from their landlord and also in both the domestic and non-domestic private rented sectors for the introduction of a minimum energy efficiency standard.

363. To use the First-tier Tribunal (General Regulatory Chamber) for a ruling related to the following:

364. Under the domestic tenants energy efficiency improvement regulations (Part 2 of The Energy Efficiency (Private Rented Property) (England and Wales) Regulations) -

- For a tenant to make an application to the tribunal on the grounds that the landlord has failed to comply with the Regulations and the requirement to provide consent for a tenant's request for energy efficiency improvements where reasonable to do so; and
- Also, to use the First-tier Tribunal (General Regulatory Chamber) for appeals against the following:

365. Under the domestic and non-domestic minimum energy efficiency standard regulations (Part 3 of The Energy Efficiency (Private Rented Property) (England and Wales) Regulations) -

- for a landlord to appeal against a civil penalty notice imposed by local authorities for non-compliance with the regulations and the required minimum energy efficiency standard or for the provision of false information in connection with compliance of the regulations.

- Where permission is given there will be a right of appeal following the First-tier Tribunal procedures; the Upper Tribunal will be used for these appeals falling under both Part 2 and Part 3 of The Energy Efficiency (Private Rented Property) (England and Wales) Regulations.

366. In addition to the tribunal processes outlined above, the County Court will be used by a local authority to recover any debt associated with an unpaid penalty issued to a landlord in connection with non-compliance of the minimum energy efficiency standard regulations. The details and the costs associated with this process are being finalised through on-going discussions with Ministry of Justice officials.

What is your proposal intending to achieve, over what geographical region (England, England and Wales), and in what timescale?

367. The proposal above is intended to provide rulings in England and Wales for non compliance with the requirement to provide consent for a tenant's request for energy efficiency measures where reasonable to do so and also to provide a right of appeal against any tribunal ruling. The tenants' energy efficiency improvement regulations will come into force in April 2016.

368. The proposal is also intended to provide a right of appeal in England & Wales against civil penalties imposed by the local authorities for non-compliance with the required domestic or non-domestic minimum energy efficiency standard regulations. The minimum energy efficiency standard regulations for both the domestic and non-domestic sectors will come into force from October 2016 although the minimum standard will not apply until April 2018.

What public commitments have been given and to whom?

369. The Energy Act 2011 provides a duty on the Secretary of State to introduce tenants' energy efficiency improvement regulations no later than April 2016 and for minimum energy efficiency standard regulations for the domestic and non-domestic private rented sectors to be introduced no later than April 2018. A

public consultation on the regulations ran between 22 July and 2 September 2014. The Government has stated its intention to issue the consultation response and lay the regulations by the start of 2015.

What are the options under consideration?

370. The Energy Act 2011 provides for the tenant energy efficiency improvement provisions to be enforced through a court or tribunal. The Energy Act 2011 provides for the minimum energy efficiency standard provisions to be enforced by a local authority or local weights and measures, and where the regulations allow, the imposition of a civil penalty also for a right of appeal to a court or tribunal.

371. The options being considered are those provided by the Energy Act through use of a tribunal. Specifically, to use the First-tier Tribunal (General Regulatory Chamber) for:

- making a ruling related to the possible non-compliance with the requirement to provide consent for a tenant's request for energy efficiency improvements where reasonable to do so under the tenants' energy efficiency improvement regulations - Part 2 of The Energy Efficiency (Private Rented Property) (England and Wales) Regulations); and

- for appeals against civil penalties imposed by local authorities for non-compliance with the required minimum energy efficiency standard or for the provision of false information in connection with compliance of the domestic and non-domestic minimum energy efficiency standard regulations - Part 3 of The Energy Efficiency (Private Rented Property) (England and Wales) Regulations).

372. Where permission is given, to use the Upper Tribunal for the following:

- Appeals against the ruling made by the First-tier Tribunal about non-compliance with the requirement to provide consent for a tenants request for energy efficiency measures where reasonable to do so under the tenants' energy efficiency improvement regulations - Part 2 of The Energy Efficiency (Private Rented Property) (England and Wales) Regulations); and

- Appeals against the decision made by the First-tier Tribunal about non-compliance with the required minimum energy efficiency standard or the provision of false information in connection with compliance of the regulations under the domestic and non-domestic minimum energy efficiency standard regulations - Part 3 of The Energy Efficiency (Private Rented Property) (England and Wales) Regulations).

How does the proposal change what happens now? Who will be affected and in what numbers?

373. The proposed tenants' energy efficiency improvement and minimum energy efficiency standard regulations - Part 2 and 3 of The Energy Efficiency (Private Rented Property) (England and Wales) Regulations) are a new approach to improving the energy efficiency of properties in the private rented sector. Energy efficiency improvements are currently carried out in the private rented sector on a voluntary basis. The regulations will mandate energy efficiency improvements for the most energy inefficient properties in the sector. The Energy Act 2011 provides a duty on the Secretary of State to bring in secondary legislation to provide tenants with a right to request consent for energy efficiency improvements no later than 1 April 2016 and to prohibit the least energy efficient properties from being let until they are improved to a specified minimum standard no later than 1 April 2018.

374. In 2012, in the domestic sector, about 18% of all dwellings in England and Wales were in the private rented sector and approximately 9% of these had an F or G Energy Performance Certificate (EPC), the most energy inefficient ratings.Once EPC exemptions are taken into account (the minimum standard regulations will only affect properties with an EPC), approximately 360,000 F and G EPC rated properties will be affectived. These properties will be below the minimum standard (initially set at an E EPC rating) and therefore will be captured by the minimum energy efficiency standard regulations.

375. Under current legislation, an EPC is only required when a property is let or sold. This has only been a requirement in England and Wales since October 2008. Over time, the number of properties with an EPC will naturally increase. Given this, only a proportion of F and G EPC rated properties in the private rented sector will have to comply with the regulations immediately when they are introduced in April 2008.

376. There are around 1.2 million non-domestic PRS hereditaments in the non-domestic PRS, comprising around 66% (by value) of the non-domestic stock. In total around 18% of non-domestic properties have an EPC rating of below E EPC. This represents around 0.4 million properties which will be caputred by the minimum energy efficiency standard regulation. The only exceptions will be: any property which is let on a tenancy which is granted for a term of 6 months or less (provided the granting of the tenancy does not mean the tenant will have occupied the property for in excess of 12 months); any property let on a tenancy for 99 years or more; and any property that is not required to have an EPC.

377. Under the minimum energy efficiency standard regulations there are also temporary exemptions which will apply to properties in scope. A temporary exemption may apply if:

- consent is not obtained from all interested parties for the energy efficiency measures;
- improvements cannot be made at no net or upfront costs to the landlord, i.e. the cost of works, including finance costs, exceed the expected savings from the measures.
- there is a material net decrease in the property's value following the installation of measures that is greater than 5%.

378. A temporary exemption is granted to a property under the minimum energy efficiency standards for five years, unless the exemption relates to tenant consent being denied, where it will expire at the end of the tenancy if before five years. Where a temporary exemption is sought, the landlord will be required to register the exemption on a private rented sector exemptions database, and provide evidence when asked by a Local Authority. Failure to register any exemption will amount to non-compliance with the regulations and may result in a financial penalty. A penalty may also be issued by a local authority for non-compliance with the minimum energy efficiency regulations. The right to appeal to the First-tier Tribunal under the regulations will be against penalties imposed by a local authority or in relation to false proof being provided to show compliance of the regulations.

379. Under the tenant energy efficiency improvement regulations, any tenant in one of the 4.2 million private rented sector properties will have the right to request consent for energy efficient measures from their landlord. (There is currently no requirement for a landlord to respond to a reasonable request from tenants for such improvements.) It is anticipated that the number of tenants who choose to exercise this new right may be very low. Of these cases, it will only be where there is a dispute relating to the tenant request for consent for energy efficiency improvements and the associated landlord response that one of the parties

may take the dispute to the tribunal. Again, we anticipate the number of disputes being taken to the tribunal will be very low.

Criminal Offences and Civil Penalties and Sanctions

Are you creating new civil sanctions, fixed penalties or civil orders with criminal sanctions or creating or amending criminal offences?

380. The Energy Act 2011 has provisions for sanctions and penalties for energy efficiency in the private rented sector as follows:

- A tribunal or court will be used for a ruling on non-compliance by the landlord of a tenant request for consent to energy efficiency improvements; and

- A tribunal or court will be used for appeals against civil penalties imposed by local authorities for non-compliance of the required domestic and non-domestic minimum energy efficiency standard or for the provision of false information in connection with compliance of the regulations.

381. The maximum penalty for non- compliance with the requirements of the domestic minimum energy efficiency standard regulations is £5,000. A maximum penalty is not specified in the Energy Act 2011 for the non-domestic regulations.

382. Details of the penalty regime will be provided in the secondary legislation for the private rented sector regulations within the framework given by the Energy Act 2011.

383. The secondary legislation, The Energy Efficiency (Private Rented Property) (England and Wales) Regulations, creates new civil sanctions, the details are below in the response to the second part of question 3.

Please provide details of the relevant legislation (where appropriate) and confirm whether the creation or amendment to criminal offense and penalties has been agreed with MoJ.

384. Sanctions and penalties for The Energy Efficiency (Private Rented Property) (England and Wales) Regulations:

385. The domestic and non-domestic minimum energy efficiency standard regulations will create new civil sanctions to be imposed by local authorities as follows:

- Where a local authority suspects a landlord with a property in scope of the regulations is not compliant, or has not sufficiently proved an exemption, the local authority can serve a compliance notice on the landlord requesting further information it considers necessary to confirm compliance. If is not provided, or is provided and is not sufficient to prove compliance, the local authority may proceed to issuing a penalty notice.

- Under the domestic minimum energy efficiency standard regulations, penalties for a single offence may be cumulative, up to a maximum of £5,000. Further penalties may be awarded for non-compliance when: there is a change to the tenant in the property; the regulatory backstop comes into effect on 1 April 2020 for domestic landlords, 1 April 2023 for non-domestic landlords; or when the minimum energy efficiency standard increases on 1 April 2025.

386. The domestic minimum energy efficiency standard regulations will set the details of the penalty regime as follows:

- Failure to notify a central Private Rented Sector Exemptions Database with required informatioon relating to compliance with the regulations: Penalty £1,000

- Provision of false or misleading information to the Private Rented Sector Exemptions Database: Penalty £1,000

- Failure to comply with a compliance notice from a local authority: Penalty £2000

- Renting out a non-compliant property with less than three months non-compliance: Penalty £2,000 fixed rate

- Renting out a non-compliant property with three months or more non-compliance: Penalty £4,000 fixed rate

387. The non-domestic minimum standard energy efficiency standard regulations will set the details of the penalty regime as follows:

- Failure to notify a central Private Rented Sector Exemptions database with required information relating to compliance with the regulations: Penalty £2,000

- Provision of false or misleading information to the Private Rented Sector Exemptions Database: Penalty £5,000

- Failure to comply with a compliance notice from a local authority: Penalty £5,000

- Renting out a non-compliant property with less than three months non-compliance: Penalty 10% of rateable value, but with a minimum penalty of £5,000 and a maximum penalty of £50,000

- Renting out a non-compliant property with more than three months non-compliance: Penalty 20% of rateable value, but with a minimum penalty of £10,000 and a maximum penalty of £150,000

388. Upon receiving a penalty notice from a local authority, a landlord may request a review of the local authority's decision to serve the notice. If a landlord requests a review, the local authority must consider any representations made by the landlord and all other circumstances of the case, decide whether to confirm the penalty charge notice, and give notice of their decision to the landlord. If the local authority is not satisfied that the landlord committed the breach specified in the notice, or given the circumstances of the case it was appropriate for a penalty charge notice to be served, they must withdraw the penalty notice.

HM Courts & Tribunals Service

Increasing Business for the Courts and Tribunals

Do you expect there to be an impact on HM Courts and Tribunals Service through the creation of or an increase in applications/ cases? Please provide an estimate.

389. It is difficult to estimate the impact of the private rented sector energy efficiency regulations on the tribunal service. The number of civil penalties that might be issued under the minimum energy efficiency standard regulations and the number of cases requiring a ruling under the tenant energy efficiency improvements regulations and consequently the number of appeals taken to a tribunal will depend on a number of factors:

- the proportion of the properties in the private rented sector that that have an EPC, that also have an EPC rating of F or G and do not fall under one of the exemption categories after April 2018 will affect the number of properties that will have to comply with the minimum energy efficiency standard regulations.
- levels and effectiveness of enforcement by local authorities of the minimum energy efficiency standards regulations. We are investigating funding for local authorities for enforcement so that non-compliance can be identified and acted upon. The Government is committed to ensuring that any new burden on local authorities for enforcement of the regulations is funded
- awareness among tenants of their new right to request consent for energy efficiency improvements from their landlords and their willingness to approach landlords to make a request. Issues such as fears of retaliatory evictions may prevent tenants from taking action initially. However, there is little in the nature of the tenant's request process that is disadvantageous to the landlord and that may lead to retaliatory evictions, as the tenant is making the request to improve the landlord's property and ensuring any improvements are funded at no upfront cost to the landlord.

390. Based on these factors, it seems reasonable to assume that the number of appealed rulings under the tenant energy efficiency improvement regulations could be ten or less per annum from April 2016. The Government plans to produce guidance for the private rented sector to raise awareness and understanding of the regulations with the aim of ensuring the number of cases going to tribunal is kept to a minimum.

391. In terms of the minimum energy efficiency standard regulations, it seems reasonable to assume that the number of appealed civil penalties may be similar at around ten or less per annum each for both the domestic and non-domestic sectors from April 2018.

Would you expect fewer cases to come to HM Courts & Tribunals Service as a result of the proposal? Please provide an estimate of the number of cases.

392. As the number of properties with EPCs increases and a greater number of properties within the private rented sector will need to comply with the minimum energy efficiency standard regulations we expect an initial increase in cases being taken to the tribunal in the early years after April 2018 when the regulations will apply to new tenancies and tenancy renewals and then another increase in April 2020 when the regulations will apply to all existing tenancies. However, as the percentage of properties already in compliance with the regulations increases in subsequent years and the sector and enforcement bodies become more familiar with the requirements of the regulations then this should result in a levelling off and then a reduction in the number of cases being taken to the tribunal.

393. Similarly with the tenant energy efficiency improvements regulations we expect an initial rise, albeit small number of cases being taken to the tribunal from April 2016, however as the minimum energy efficiency standard regulations come into force in April 2018 we antipate the number of cases related to the tenant energy efficiency improvement regulations should reduce.

Appeal Rights

Does your proposal create a new right of appeal or route to judicial review? If so, how will be handled (i.e. by HM Courts & Tribunals Service)?

394. Yes. The intent is to create a right of appeal against penalties issued by local authorities under the domestic and non-domestic minimum energy efficiency standard regulations. Also the intent is to create a right to appeal against rulings by the tribunal in relation to the tenant energy efficieincy improvement regulations.

Do you expect to establish a new tribunal jurisdiction? If so, has this been discussed with HM Courts & Tribunals Service?

395. No. As agreed with MoJ the First-tier Tribunal, General Regulatory Chamber will be responsible for hearing applications relating to the tenant's energy efficiency improvement regulations and for handling appeals relating to the issue of penalties for non-compliance with the minimum energy efficiency standard regulations.

Alternative Dispute Resolution

Has the use of alternative dispute resolution (ADR) procedures (Including mediation) been considered? If not, why not?

396. Yes. However, the Energy Act 2011 specifically states that a tribunal or court will be used for appeals against civil penalties and does not give powers for an alternative route such as an ombudsman to be used. Therefore it is proposed that in line with the primary legislation that a tribunal will be used rather than an alternative dispute resolution.

HMCTS Enforcement

Will the proposal require enforcement mechanisms for civil debts, civil sanctions or criminal penalties?

397. The proposal will require enforcement for civil debts in relation to unpaid penalties. All other enforcement procedures under the minimum energy efficiency standard regulations including issuing of penalties will be the responsibility of local authorities.

HMCTS Procedural Rules, Sentencing and Penalty Guidelines

Do you anticipate that Court and/or Tribunal procedural rules will have to be amended? If so, when is the likely date for the changes?

398. The private rented sector energy efficiency regulations will use the existing First-tier Tribunal and General Regulatory Chamber Rules that are already in place.

Will the proposals require sentencing and/ or penalty guidelines to be amended?

399. The proposals will require new penalty guidelines for the private rented sector energy efficiency regulations for example to reflect the cumulative nature of penalties and the criteria for issuing penalties. We will work with MoJ to ensure that appropriate guidance is in place.

Legal Aid

Is you proposal likely to have an impact on the Legal Aid fund?

400. No. But we will continue to work with MoJ and will follow any guidance given.

If legal aid may be affected, will (i) criminal, or (ii) civil and family, or (iii) asylum legal aid be affected?

401. Not applicable.

If legal aid may be affected, would legal aid costs increase or be reduced (and by what margin)?

402. Not applicable.

Prisons and Offender Management Services

Will the proposals result in an increase in the number of offenders being committed to custody (including on remand) or probation (community sentences)?

405. No

Will the proposals result in an increase in the length of custodial sentences? If so, please provide details.

406. No.

Will the proposals create a new custodial sentence? If so, please provide details.

407. No.

What do you expect the impact of the proposals on probation services to be? Please give explanation/ calculations.

408. None.

Summary

Who will be affected by this proposal in MoJ? (details from the information provided above)	Volumes	Type (e.g. prison place, tribunal hearing, fixed, penalty, etc.)	Estimated costs (£)
Criminal Offences and Civil Penalties and Sanctions	It is difficult to estimate the impact on the tribunals but expect the number of cases requiring a ruling under the tenant energy efficiency improvement to be less than ten per annum from April 2016. This level is expected to decrease substantially as the minimum energy efficiency standard regulations come into force in April 2018	Tribunal hearing to make rulings regarding non-compliance by a landlord in relation to a tenant request for consent for energy efficiency measures.	Low scenario - based on 2 cases per year for the first two years between April 2016 & April 2018: Start-up costs £7,000 First year running costs £35,000 Total £49,000 Median and expected scenario - based on 10 cases per year for first two years between April 2016 & April 2018 Start-up costs £7,000 First year running costs

			£35,000 Additional cases: £35,000 Total: £77,000 High scenario based on 25 cases per year for first two years between April 2016 & April 2018 Start-up costs £7,000 First year running costs £35,000 Additional cases: £140,000 Total £182,000
	It is difficult to estimate the impact on the tribunals but expect the number of appeals against civil penalties to be less than ten per annum for each of the domestic and non-domestic sectors by April 2018. This number will start to decrease as the number of properties in compliance with the regulations increases.	Tribunal hearing for appeals against fixed civil penalties to be imposed by local authorities for domestic and non-domestic minimum energy efficiency standard regulations or for provision of false information in connection with non-compliance of the regulations.	Low scenario - based on 2 cases each for domestic & non-domestic per year for the first two years from April 2018: Start-up costs £7,000 First year running costs £35,000 Total £56,000 Median and expected scenario - based on 10 cases each for domestic & non-domestic per year for first two years from April 2018 Start-up costs £7,000 First year running costs £35,000 Additional cases: £105,000 Total: £147,000 High scenario based on 25 cases each for domestic & non-domestic per year for first two years from April 2018

			Start-up costs £7,000 First year running costs £35,000 Additional cases: £315,000 Total £357,000

Who Will be Affected by this Proposal in MoJ? (details from information provided above).	**Volumes**	**Type (e.g. prison place, tribunal hearing, fixed penalty, etc).**	**Estimated Costs (£)**
HM Courts and Tribunal Services	As above under civil penalties and sanctions section	As above under civil penalties and sanctions section	As above under civil penalties and sanctions section
Legal Aid	N/A	N/A	N/A

Prisons and Offender Management Services (Only complete if maximum penalty is something other than a fine)

Offence	Maximum Penalty	No. of prosecutions brought per annum	Likely conviction rate	Likely Sentence

Annex H – Energy Saving Measures Included in the Non-Domestic PRS Model

Annex Table 9 Most commonly recommended on non-domestic EPCs

Measure type	*Measure description*
EPC-L5	Consider replacing T8 lamps with retrofit T5 conversion kit.
EPC-E5	Some windows have high U-values - consider installing secondary glazing.
EPC-L7	Introduce HF (high frequency) ballasts for fluorescent tubes: Reduced number of fittings required.
EPC-H7	Add optimum start/stop to the heating system.
EPC-L2	Replace tungsten GLS lamps with CFLs: Payback period dependent on hours of use.
EPC-V1	Some spaces have a significant risk of overheating. Consider solar control measures such as the application of reflective coating or shading devices to windows.
EPC-H8	Add weather compensation controls to heating system.
EPC-E8	Some glazing is poorly insulated. Replace/improve glazing and/or frames.
EPC-R3	Consider installing solar water heating.
EPC-H5	Add local time control to heating system.
EPC-E4	Some walls have un-insulated cavities - introduce cavity wall insulation.
EPC-R5	Consider installing an air source heat pump.
EPC-H6	Add local temperature control to the heating system.
EPC-H2	Add time control to heating system.
EPC-W1	Install more efficient water heater.
EPC-R4	Consider installing PV.
EPC-L1	Replace 38mm diameter (T12) fluorescent tubes on failure with 26mm (T8) tubes.
EPC-H3	Consider replacing heating boiler plant with a condensing type.
EPC-L4	Replace tungsten GLS spotlights with low-voltage tungsten halogen: Payback period dependent on hours of use.
EPC-E6	Some loft spaces are poorly insulated - install/improve insulation.
EPC-H1	Consider replacing heating boiler plant with high efficiency type.
EPC-R1	Consider installing a ground source heat pump.
EPC-W2	Consider replacing HWS with point of use system.
EPC-E2	Roof is poorly insulated. Install or improve insulation of roof.

EPC-E1	Some floors are poorly insulated - introduce and/or improve insulation. Add insulation to the exposed surfaces of floors adjacent to underground, unheated spaces or exterior.
EPC-W3	Improve insulation on HWS storage.
EPC-C3	Ductwork leakage is high. Inspect and seal ductwork.
EPC-E3	Some solid walls are poorly insulated - introduce or improve internal wall insulation.
EPC-W4	Add time control to HWS secondary circulation.
EPC-L3	Replace high-pressure mercury discharge lamps with plug-in SON replacements.
EPC-L6	Replace high-pressure mercury discharge lamps with complete new lamp/gear SON (DL).
EPC-C2	Chiller efficiency is low. Consider upgrading chiller plant.

Annex I – Underlying assumptions underpinning the National Household Model and Non-Domestic PRS model

409. Table 10, below, shows our cost assumptions underpinning our modelling for the National Household Model, as well as each measure's assumed lifetime.

Annex Table 10 Costs and assumed lifetimes of measures within the National Household Model

Measure Description	Small Flat	Large Flat	Small semi-detached or end-of-terrace	Large semi-detached or end-of-terrace	Small detached house	Large detached house	Small mid-terrace	Large mid-terrace	Measure lifetime
Loft insulation	£288	£491	£232	£368	£313	£643	£217	£341	42
Cavity wall insulation	£119	£204	£387	£613	£555	£1,140	£223	£350	42
Hot water cylinder insulation	£30	£30	£30	£30	£30	£30	£30	£30	10
Draught proofing	£48	£82	£77	£123	£104	£214	£72	£114	10
Low energy lights	£30	£50	£50	£70	£60	£80	£50	£70	10
Cylinder thermostat	£300	£300	£300	£300	£300	£300	£300	£300	12
Heating controls	£450	£450	£450	£450	£450	£450	£450	£450	12
Condensing Gas Boiler	£2,435	£2,435	£2,435	£3,086	£2,435	£3,086	£2,435	£3,086	12
New/replacement storage heaters	£1,050	£1,750	£1,750	£2,450	£2,100	£2,800	£1,750	£2,450	20
Replacement warm air unit	£1,750	£1,750	£1,750	£1,750	£1,750	£1,750	£1,750	£1,750	20
Double/secondary glazing	£1,933	£3,301	£3,483	£5,517	£4,012	£8,241	£3,432	£5,379	20
Solid wall insulation	£4,012	£4,960	£4,860	£6,018	£5,759	£8,444	£3,978	£5,085	36
Floor insulation	£480	£819	£774	£1,226	£1,043	£2,142	£725	£1,136	42
Condensing oil boiler	£3,136	£3,295	£3,295	£4,010	£3,295	£4,678	£3,295	£4,010	12

Source: National Household Model

410. Table 11 below shows how dwelling sizes are split into large and small subtypes, within the National Household Model, which is determined using the median floor area for that dwelling type:

Annex Table 11 Classification of housing type.

Dwelling type	Threshold between sizes (m2)
Small Flat	54.29
Large Flat	
Small semi-detached or end-of-terrace	80.45
Large semi-detached or end-of-terrace	
Small detached house	117.03
Large detached house	
Small mid-terrace	75.5
Large mid-terrace	

Source: National Household Model

411. Energy savings are based on those assumed within the standard assessment procedure, adjusted for 'in use factors'[168].

412. Table 12, below, shows the life expectancy of measures and average cost of measures assumed within the Non-Domestic PRS model. The costs of measures within the model are assumed to vary between different building types.

Annex Table 12 Average Cost of measures and their assumed lifetime within the Non-domestic PRS model

Measure	life expectancy	Average cost per sq metre
Consider replacing T8 lamps with retrofit T5 conversion kit.	10	£7
Some windows have high U-values - consider installing secondary glazing.	20	£49
Introduce HF (high frequency) ballasts for fluorescent tubes: Reduced number of fittings required.	10	£4
Add optimum start/stop to the heating system.	12	£11
Replace tungsten GLS lamps with CFLs: Payback period dependent on hours of use.	10	£4
Some spaces have a significant risk of overheating. Consider solar control measures such as the application of reflective coa	20	£17
Add weather compensation controls to heating system.	12	£10
Some glazing is poorly insulated. Replace/improve glazing and/or frames.	20	£122
Consider installing solar water heating.	25	£253
Add local time control to heating system.	12	£2
Some walls have uninsulated cavities - introduce cavity wall insulation.	42	£5
Consider installing an air source heat pump.	15	£50
Add local temperature control to the heating system.	12	£5
Add time control to heating system.	12	£1
Install more efficient water heater.	15	£5
Consider installing PV.	25	£95
Replace 38mm diameter (T12) fluorescent tubes on failure with 26mm (T8) tubes.	10	£1
Consider replacing heating boiler plant with a condensing type.	12	£3
Replace tungsten GLS spotlights with low-voltage tungsten halogen: Payback period dependent on hours of use.	10	£16
Some loft spaces are poorly insulated - install/improve insulation.	42	£2
Consider replacing heating boiler plant with high efficiency type.	12	£3
Consider installing a ground source heat pump.	20	£87
Consider replacing HWS with point of use system.	15	£4
Roof is poorly insulated. Install or improve insulation of roof.	42	£35
Some floors are poorly insulated - introduce and/or improve insulation. Add insulation to the exposed surfaces of floors ad	42	£27
Improve insulation on HWS storage.	15	£0
Ductwork leakage is high. Inspect and seal ductwork.	15	£9
Some solid walls are poorly insulated - introduce or improve internal wall insulation.	36	£33
Add time control to HWS secondary circulation.	15	£1
Replace high-pressure mercury discharge lamps with plug-in SON replacements.	10	£8
Replace high-pressure mercury discharge lamps with complete new lamp/gear SON (DL).	10	£18
Chiller efficiency is low. Consider upgrading chiller plant.	15	£12

Source: Non Domestic PRS Model

[168] See the 2012 ECO impact assessment for more information. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42984/5533-final-stage-impact-assessment-for-the-green-deal-a.pdf