IPF RESEARCH

JANUARY 2026

IPF Research Awards 2024
Integrating Climate Risk into Real Estate Investment Strategies

COMMISSIONED BY THE IPF RESEARCH PROGRAMME

This research was funded and commissioned through an extension to the IPF Research Programme 2022-2025.

This Programme supports the IPF's wider goals of enhancing the understanding and efficiency of property as an investment. The initiative provides the UK property investment market with the ability to deliver substantial, objective and high-quality analysis on a structured basis. It encourages the whole industry to engage with other financial markets, the wider business community and government on a range of complementary issues.

The Programme is funded by a cross-section of businesses, representing key market participants. The IPF gratefully acknowledges the support of these contributing organisations:

INTRODUCTION

In 2024, the IPF Research Programme launched its third grants scheme to provide financial assistance to promote real estate investment research. No specific themes were suggested and prospective applicants were encouraged to examine issues that would advance the real estate investment industry's understanding of and implications for asset pricing, risk-adjusted performance and investment strategy. The scheme was also open to individuals, working within institutional organisations, where the grant may be used to fund data acquisition.

The Grant scheme was first run in 2021, when three applicants were awarded grants, and again in 2023, when the programme provided grants for six successful submissions. This time, an appraisal of proposals received by the deadline of 30 September 2024 resulted in the provision of grants to two submissions, with limited supervision afforded by a sub-committee of the IPF Research Steering Group during the research period.

Each paper is available to download from the IPF website. We hope you find them a diverse and interesting read.

The following paper has been written by Oluwaseun Ajayi, Farai Mlambo, Arti Rawat and Paulinus Ugwu.

Richard Gwilliam
Chair IPF Research Steering Group
January 2026

1. Executive Summary

Climate risk has become a tangible pricing factor for UK real estate. Yet the residential market along the Thames Estuary still behaves as though flood exposure were an abstract threat. Homebuyers and small landlords rarely reflect long-term environmental risk in what they pay, even as insurance costs, regulation, and lender caution rise. By contrast, commercial investors already model climate costs (retrofitting, insurance escalation, void risk) within their discounted cash-flow projections. This divergence has created a systemic mispricing gap between physical exposure and financial value across the Estuary's housing market.

The project addresses a single question:

> To what extent is climate exposure already priced into residential property values in the Thames Estuary, and how might this influence future valuation and investment strategy?

The goal is to convert environmental data into financial language, giving valuers, lenders, and policymakers a clearer sense of where climate risk is sitting in the price and where it is not.

The analysis integrates property transactions, flood-risk data and postcode-level insurance costs to isolate the financial impact of exposure. Using an advanced spatial and machine-learning framework, it measures both the implicit market discount and the explicit cost of insurance. Commercial data are referenced only for context, highlighting the contrast between institutional adaptation and household behaviour. We find that flood-exposed homes carry a price discount of 5.8–6.3%, around £22,000 on a £360,000 property.

Insurance costs are roughly £620 higher per year in high-risk areas, equating to £7,400 in present-value terms. Together, these represent an 8% Climate Risk Premium, or roughly 0.4% in yield terms, relative to non-exposed assets. The report introduces a Resilience-Weighted Net Present Value (RW-NPV) framework that converts these risk costs into yield adjustments compatible with discounted cash flow (DCF) models. This enables valuers, lenders and policymakers to treat resilience as a measurable financial variable. As adaptation measures under the TE2100 Plan progress, the current premium is expected to narrow, creating a measurable resilience dividend for early investors. We helped to reframe climate data as an investment signal; thereby, positioning the Investment Property Forum to lead on setting a market standard for climate-adjusted valuation.

Pricing tests and a RW-NPV worked example - depending on the outcome of the CA-NPV analysis above - use residential transactions; commercial evidence is cited for contextual comparison and practice contrasts.

Table of Content

The Challenge

The UK's commercial and residential real estate markets are entering a new risk frontier; one shaped by rising seas, heatwaves, and floods, and also by the market's ability (or failure) to price these risks accurately and act accordingly.

Nowhere is this tension more visible than the Thames Estuary. Despite being home to some of the UK's highest-value property assets and subject to one of the world's most ambitious flood defence strategies: the Thames Estuary 2100 (TE2100) Plan, investors still lack clear, consistent signals on how to price resilience, manage exposure, and reallocate capital effectively. While climate risks are growing more visible, they are not being meaningfully priced. This creates a dangerous gap between environmental reality and market behaviour. Investors are flying blind and the cost of mispricing could be severe.

What We Did

This study analysed over 10,000 residential property transactions, flood zone maps, energy ratings, and investor behaviour patterns across the TE2100 corridor. We combined new spatial valuation models with real-world market data to answer a critical question:

Are climate risks and adaptation policies like TE2100 being priced into real estate markets and if so, where, how, and by how much?

Key Findings

1. Regulation moves markets; weather doesn't

Markets respond to government signals, not natural disasters. Price shifts followed policy events like new energy rules and TE2100 announcements and not after floods, heatwaves, or hazard warnings. This means regulation, not risk, is still the primary pricing trigger.

2. Climate visibility ≠ valuation

Properties in high-risk zones often saw no price discount unless linked to a financial consequence such as mortgage restrictions, insurance costs, or EPC penalties. The presence of flood maps alone is not enough to shift capital.

3. Resilience-adjusted valuation changes the game

We tested a new pricing model: Resilience-Weighted Net Present Value (RW-NPV). Properties that appear valuable under traditional models (for example riverside bungalows, park homes) underperform once flood and regulatory risk are factored in. Conversely, EPC-compliant flats in protected TE2100 zones gain a pricing advantage.

4. Investors are reactive, not strategic

Short-term liquidity spikes follow regulatory announcements, but few investors appear to reposition portfolios proactively based on long-term resilience trends. This reveals a missed opportunity and a growing exposure risk.

2. Introduction

In UK real estate, some of the country's most valuable locations are also among its most physically exposed. From Canary Wharf to Woolwich, from Barking Riverside to Southend-on-Sea, large concentrations of residential and commercial property sit within tidal flood corridors that face rising climate risk. Yet transaction pricing continues to reflect a market that treats flood exposure as a secondary consideration rather than a material financial variable. To date, there is limited empirical evidence of systematic pricing of physical flood risk or long-term regulatory exposure in UK sales data. In many riverside locations, properties continue to transact at strong values driven by amenity appeal, regeneration narratives and transport connectivity. Planning approvals continue to be granted in flood-designated zones, even as delivery, insurance and resilience costs rise. Market pricing remains anchored in conventional location and specification metrics, with little observable capitalisation of future adaptation costs. This report focuses on the Thames Estuary, the most economically significant floodplain in the United Kingdom and the location of its most ambitious climate adaptation programme.

Launched in 2012, the Thames Estuary 2100 Plan was designed to protect more than 1.4 million people and approximately £275 billion of property, infrastructure and economic activity from future tidal flooding. It establishes a 100-year adaptive strategy for managing flood risk through a combination of engineered defences, embankments, land-use controls and phased public investment across ten policy units. These include some of the fastest-growing residential corridors in London and the South East, such as Greenwich Peninsula, Thamesmead, Barking Riverside and the Royal Docks. The scale of public intervention is unprecedented in UK flood policy. However, there is little evidence that residential property markets are yet incorporating the long-term financial implications of flood exposure or the regulatory transition implied by TE2100. Across much of the estuary, properties located within flood zones continue to transact at premium values where riverside proximity and regeneration branding dominate buyer behaviour. Price formation remains driven by short-term demand fundamentals rather than long-horizon resilience costs. There is limited evidence that future protection levies, insurance repricing, retrofit requirements or regulatory tightening are being reflected in transaction prices or development appraisals.

This creates a growing disconnect between infrastructure planning and market valuation. From a financial perspective, this disconnect is material. Residential property is a long-duration asset class. It sits on household balance sheets, mortgage books, pension fund portfolios and institutional platforms for decades. Where physical risk is not priced early, it does not disappear. It accumulates and ultimately surfaces through insurance withdrawal, higher financing costs, mandatory retrofit programmes, transaction illiquidity and capital impairment. Climate risk in the Thames Estuary is therefore not a distant environmental concern. It is an emerging valuation variable.

Residential Scope and Data Focus

This study focuses explicitly on UK residential real estate across the Thames Estuary corridor. The residential market provides the only asset class with sufficiently granular and transparent transactional data at postcode level, combined with full national EPC coverage and detailed flood risk mapping. This enables direct empirical testing of how physical exposure, regulatory transition and building efficiency interact with price formation in live markets. At present, equivalent commercial real estate transaction data with the same spatial resolution and disclosure quality is not publicly available in the UK. While the analytical framework developed in this report is fully transferable to offices, logistics, retail and mixed-use assets, robust asset-level testing in the commercial sector remains constrained by data availability. Residential property therefore provides the most reliable laboratory for assessing whether climate risk and adaptation infrastructure are being priced into UK real estate markets in practice.

Research Approach and Contribution

This report examines whether the housing market is beginning to price climate risk in one of the country's most exposed and most protected regions. We analyse thousands of residential transactions across the Thames Estuary corridor, alongside flood risk designations, regulatory events and building energy ratings. We map observed price behaviour against physical exposure. We test whether proximity to TE2100 infrastructure is associated with valuation effects. We introduce a new valuation framework, **Resilience-Weighted Net Present Value,** which adjusts asset value for physical flood risk and regulatory transition exposure. This report is about market response.

What happens when risk is mapped but not yet mandated?
Which signals do buyers respond to in practice?
Which assets are most likely to become mispriced, underperforming or stranded over the next three to five years rather than in fifty?

The central finding is that the greatest risk is not environmental alone. It is financial complacency. It is the assumption that as long as government has a plan, the market can afford to wait and our findings dare note that it cannot. Climate-adjusted pricing is already emerging. Insurance conditions are tightening. Flood resilience retrofits are expensive and not yet standardised. When market corrections arrive, they do not unfold gradually. The implications are that they reprice quickly and unevenly. For investors, lenders and policymakers, the question is no longer whether climate adaptation affects value, but when, where and by how much.

3. The Investment Problem

Across the UK, climate risks are rising but property prices are not falling. This pattern is consistent with mispricing markets are behaving as though government protection, insurance coverage, and buyer appetite will continue uninterrupted, even in places that are directly exposed to climate disruption. This creates a silent liability: assets that appear sound on paper but are increasingly exposed in practice.

The issue is clearest in flood-prone areas especially along the Thames Estuary. Take, for example, a newly renovated £1 million townhouse overlooking the Thames in Greenwich. It is close to transport links, has scenic river views, and benefits from the prestige of waterside living. But it also sits within a TE2100 flood zone and has an Energy Performance Certificate (EPC) rating of D. While the asking price may reflect demand-side enthusiasm, the longer-term holding risk is rising.

Insurers are already warning that properties in high-risk flood zones may face escalating premiums or policy refusals. Some mortgage lenders are beginning to ask more probing questions about flood resilience. And under new energy regulations, landlords will soon be unable to let out properties that don't meet minimum EPC thresholds and this is a change that will hit older, riverside housing stock the hardest.

And yet, despite these material risks, the pricing on many of these assets has not moved. Buyers continue to pay premiums for river views, while ignoring flood risk markers. Developers continue to invest in low-lying regeneration sites such as Barking Riverside or Thamesmead based on planning permissions and short-term yield, with limited regard for mid-century resilience thresholds.

This is not just a Thames problem.

In February 2024, flooding in parts of Yorkshire caused widespread property damage and displacement. Yet within months, house prices in the affected postcodes rebounded to pre-flood levels. In the 2022 heatwave, properties in Greater London saw temperatures exceed 40°C, triggering transport failures and heat stress warnings. But reported commercial rents showed limited short-term adjustment even in offices without cooling systems or energy-efficient insulation.

This behaviour reflects a broader trend: UK property markets are still anchored in historic valuation logic and climate-adjusted risk. Buyers, valuers, and lenders tend to focus on location, size, and comparables, but rarely price in exposure to physical or regulatory shocks. As a result, assets that should be discounted remain overvalued. For institutional investors managing long-hold assets, pension funds, or large development portfolios, this creates a dilemma. It is no longer safe to assume that a property's value today reflects its true resilience tomorrow. Assets in flood-prone areas may become uninsurable, reducing their liquidity. Rental flats with poor EPC ratings may become non-compliant, requiring expensive upgrades or risking regulatory fines. Office buildings without passive cooling or green infrastructure may suffer occupancy losses in heatwaves.

Yet in each of these cases, the market is not signalling concern until it is too late. The result is a growing misalignment between climate risk visibility and capital allocation. The investment problem is not a lack of data. Flood maps exist. EPC ratings are public. Adaptation plans like TE2100 are detailed and accessible. The problem is that none of these signals have yet translated into consistent pricing behaviour. This lag is dangerous because markets move fast when they catch up. If insurance firms withdraw cover in vulnerable postcodes, valuations could drop overnight. If mortgage lenders adjust loan-to-value ratios in flood zones, sales volumes could collapse. And if regulators impose mandatory climate stress testing or carbon risk disclosures, many real estate portfolios may find themselves underperforming without warning.

Investors who wait for these shifts to appear in comps or indices will be reacting and not leading. To remain competitive, real estate capital must now build forward-looking pricing models. Climate risk must be treated as a core financial variable and not a future possibility. And in places like the Thames Estuary, where risk is both visible and unevenly distributed, strategic repositioning may be necessary sooner than expected.

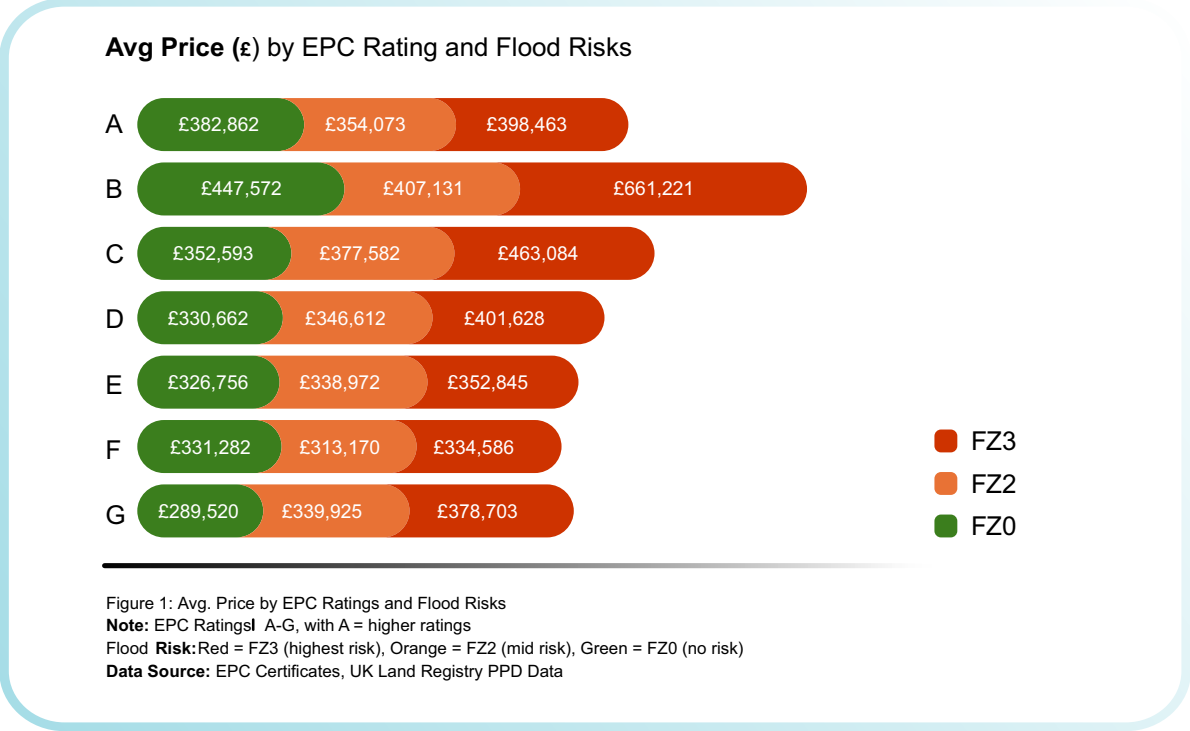


Figure 1: Avg. Price by EPC Ratings and Flood Risks
Note: EPC Ratings**l** A-G, with A = higher ratings
Flood **Risk:** Red = FZ3 (highest risk), Orange = FZ2 (mid risk), Green = FZ0 (no risk)
Data Source: EPC Certificates, UK Land Registry PPD Data

Figure 1. Resilience score versus observed price uplift for EPC A–G homes by local authority
Stronger enforcement aligns with stronger pricing. Analysis period: 2008 to 2025.

At identical EPC bands, flood risk is associated with material differences in average transaction prices, though the direction and magnitude of this effect are not uniform. In higher EPC categories (notably Band B), properties in high flood-risk zones (FZ3) exhibit higher average prices than lower-risk counterparts, while in mid-to-lower EPC bands, FZ3 values more frequently sit below no-risk (FZ0) levels. This suggests that the pricing relationship between energy efficiency and flood exposure is context-dependent rather than linear.

The takeaway?
Climate-adjusted valuations cannot be interpreted in isolation from energy efficiency. The observed interaction between EPC and flood risk produces non-linear, location-specific pricing dynamics that investors must model rather than assume. It is within this complexity that Te2100-aligned RW-NPV overlays help surface potential portfolio sensitivities that standard valuation approaches can overlook.

Insurance Premium Analysis

Insurance premiums are treated as a market signal, not a policy artefact. Insurers reprice exposure annually using updated flood models and loss experience, often ahead of valuers, lenders and buyers. Premiums therefore provide an early indication of how climate risk is already being monetised.

What we measure

For each postcode sector in the TE2100 corridor we estimate an annual premium differential between higher-risk and lower-risk locations. This creates an I**nsurance Premium Gap (IPG)** expressed in **£ per year.**

How it links to value

The IPG is (i) analysed against transactions to test whether higher ongoing insurance costs correlate with lower achieved prices, and (ii) capitalised within the RW-NPV as an operating cost line over a 15-year hold, discounted at the study reference rate. In effect, insurance acts as an explicit cash-flow drag while flood exposure also shows up as an implicit price discount.

Data and controls

Indicative premiums are derived from insurer disclosures and Flood Re / ABI guidance, aligned to Environment Agency flood layers, then matched to transactions with controls for property type, EPC band and location.

Interpretation

In areas such as Barking Creek and Thamesmead the average gap of about £620 per year equates to roughly £7,400 in present value over the hold period. Combined with the observed price discount on flood-exposed homes, this contributes to an estimated 8% Climate Risk Premium in the Estuary's residential market.

Limitations

Premiums vary by dwelling specifics and claims history. Results should be read as directional signals, not quotes for any single property. That is sufficient for portfolio and underwriting decisions.

Methodology

Scope and sample

Analysis is based on **residential** transactions in the TE2100 corridor. A wider dataset of c. 250,000 transactions across London and the South East (2018–2024) was assembled; the core analytical sample comprises over 10,000 residential sales within the TE2100 area. All pricing estimates and the **RW-NPV** worked example use residential data. Commercial data are cited **only** to illustrate differences in valuation practice, not to estimate prices.

Data

Land Registry transactions (2018–2024); Environment Agency flood zones (FZ0/2/3a/3b); EPC register; TE2100 implementation status by borough; insurer disclosures/Flood Re–ABI guidance (for indicative premiums); ONS controls. Indicative insurance premiums are **operationalised as a pricing signal** (see Method note, Section 3).

Design

Step 1 - Exposure mapping
Each sale is linked to flood exposure (EA zones), EPC band and TE2100 geography.

Step 2 - Market response
We test price and transaction-volume responses to policy and enforcement signals using hedonic, event-study and matched-pair designs.

Step 3 - Financial translation
Exposure is translated into cash-flow and yield impacts using Resilience-Weighted NPV (RW-NPV), combining implicit price discounts with explicit operating costs.

Models used

- **Hedonic price models (OLS with fixed effects):** Price per m² on flood zone, EPC, Te2100 status; controls for property type, location, time; cluster-robust SE. Insurance Premium Gap (IPG, £/year) included as an explanatory variable alongside flood zone and EPC.
- **Event-study / break tests**: Policy-timed changes in transaction volumes (Chow and Bai–Perron breakpoint tests).
- **Matched-pair comparisons:** Like-for-like assets across exposure band
- **TE2100 Planning Documents**: Local authority resilience commitments and policy phases
- **Spatial diagnostics:** Moran's I to check clustering bias.
- **RW-NPV:** Cash-flow model incorporating operating costs, capex and yield effects of resilience. Includes insurance IPG as a recurring operating cost; sensitivity tested at ±25%.

Key variables

- **Flood exposure:** EA zones; tested interactions with waterfront amenity.
  Insurance Premium Gap (IPG): Postcode-sector £/year premium differential between higher- and lower-risk areas, aligned to EA flood layers and ABI/Flood Re guidance.
  Used as both a price signal and a cash-flow input.
- **EPC band:** A–G at sale date.
- **TE2100 status:** Borough enforcement/activation categories.
- **Controls:** Type, size, neighbourhood, income, time.

A worked example illustrating how exposure translates into value is provided in Section 4; full model specifications are in Appendix A2.

4. Key Insights

Insight 1. Investors Are Reacting to Policy, Not Hazard

Across the Thames Estuary, capital behaviour tells a revealing story. In our sample, transaction activity shifted more after policy announcements than after hazard alerts. Despite high flood exposure, property prices in zones without planning restrictions or EPC enforcement remained stable or even increased. In contrast, where policy changes were visible such as consultations on energy regulation, changes to building codes, or shifts in land use policy transaction volumes and investor sentiment shifted more noticeably.

This suggests that many investors are not yet pricing in climate risk directly. Instead, they are waiting for external regulatory events to act as proxies for risk clarity. For example, Barking Riverside lies in a high flood zone and is explicitly listed in TE2100 as a location requiring future defence upgrades. Yet its average transaction price remained relatively stable over the last three years, despite repeated climate risk reports. In contrast, when proposed changes to EPC minimum lettable standards were announced in 2022, investor appetite for similar EPC-D rated housing in Royal Docks dipped sharply even though those properties faced lower immediate physical risk.

Also, some of the observed “riverside premium” may already reflect a degree of risk adjustment. Buyers pay for amenity and access; they also discount for exposure where the signals are clear. To separate these effects, we control for river proximity and amenity while testing interactions with flood zone status. In our sample, amenity value persists, but we find no consistent evidence that premiums fully incorporate flood risk where policy and insurance signals are weak. Where planning constraints, lender questions or higher indicative premiums are visible, the amenity premium narrows.

The RW-NPV model we tested highlights this gap. Locations like Greenwich scored well due to strong infrastructure, EPC improvements, and ongoing development. Others like Southend or Thamesmead, despite active regeneration, showed lower RW-NPV scores due to weak resilience premiums and limited adaptation visibility. Waterfront value is robust, but partial risk adjustment occurs only when consequences are credible (planning, lending, insurance). Until then, pricing remains sticky and vulnerable to abrupt repricing once enforcement or insurability changes land.

What This Means for Investors

- Don't wait for regulation to price in risk. Start adjusting investment theses using physical and infrastructure risk overlays now.
- Evaluate not just flood maps, but regulatory timelines. Assets near unannounced or long-term TE2100 upgrades may hold hidden liabilities.
- RW-NPV-type modelling helps compare like-for-like exposure, beyond what headline values suggest.

Energy-Efficient Properties Command Clear Price Premiums (Simplified TE2100 DATA)

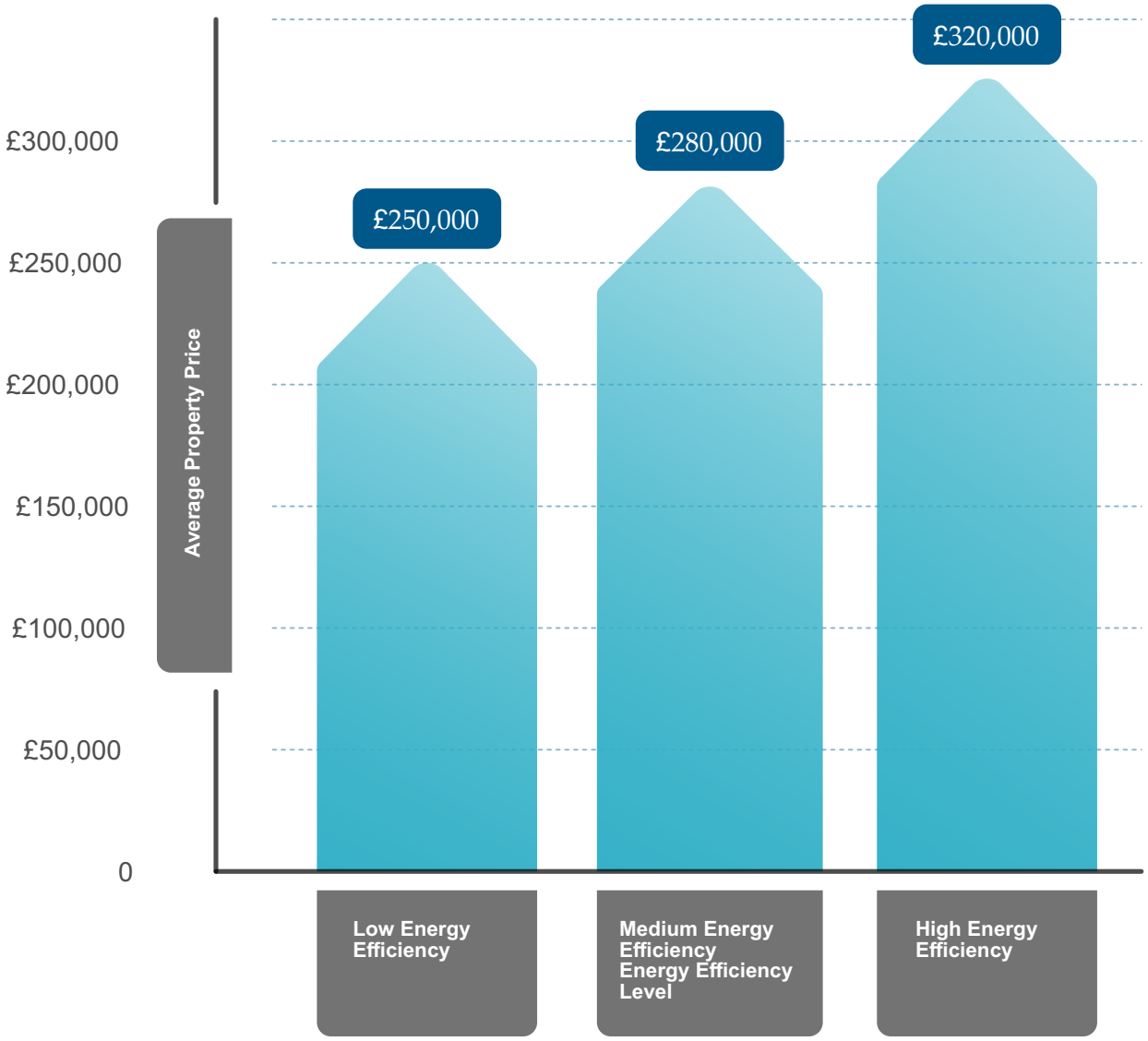


Figure 2: Average price property price to energy efficiency

Insight 2: Energy Efficiency Premiums Are Real But Patchy

The UK property market is starting to reward greener buildings. But the signal is inconsistent and easy to miss without zooming in. Our analysis shows that properties with EPC ratings of A or B routinely command higher prices per square foot compared to lower-rated assets. In some parts of the Thames Estuary, this premium can exceed 15%. Yet the pattern is not universal and often breaks down in high-demand, low-supply submarkets. For example, in parts of East London close to the river, newly built apartments with EPC B ratings sold for over £700 per square foot, while comparable units with EPC D fetched £610 or less. This reflects rising awareness among owner-occupiers and institutional landlords alike: energy costs, tenant expectations, and future regulatory shifts are now priced into the equation at least partially.

However, the premium drops significantly in regeneration hotspots like Thamesmead or Woolwich, where affordability pressures and development momentum override environmental concerns. Buyers remain willing to absorb low EPC ratings if the asset promises capital growth or benefits from Help-to-Buy legacy schemes. This inconsistency is a warning sign. The energy efficiency premium is emerging but it’s fragile. Without strong enforcement of minimum EPC standards, some developers and landlords continue to downplay its significance. But the moment regulatory teeth bite - for example, when letting bans on sub-E properties are enforced - the market could reprice dramatically.

What This Means for Investors

- Green premiums are already real and growing. Forward-looking investors can capitalise on this by backing retrofits and energy upgrades now.
- Low-EPC properties risk becoming stranded if minimum lettable standards are enforced more aggressively.
- Don't assume pricing reflects future costs especially in submarkets where supply constraints are masking environmental risks.

Average Price per Sq Ft by EPC Rating (£m²)

Figure 3: Average price per square meter by EPC ratings
Note: EPC Ratings | A -G, with A = higher ratings
Data Source: EPC Certificates, UK Land Registry PPD Data

Insight 3: Regulations Move Markets More than Floods

It might seem intuitive that rising flood risk would scare buyers and investors. But across the Thames Estuary, the evidence shows otherwise: it's not water, but regulation, that really moves markets.

In areas classified as flood-prone by the Environment Agency; but where no major planning or regulatory changes occurred, we observed minimal transaction response. Prices held. Buyers came. Deals closed. However, in similar flood-prone areas where planning consultations, energy standards, or land use revisions were introduced, the picture changed sharply. Transaction volumes fell by up to 15% within six months of regulatory signals. Even areas with little to no actual flood risk experienced significant slowdowns when policy talk intensified. In other words, the market is watching Whitehall more closely than rainfall.

This behavioural insight is crucial. Investors relying purely on physical hazard maps to guide strategy risk being blindsided by sudden regulatory shifts: the kind that trigger lender pullback, insurance repricing, or tenant exit. The "Transaction volume change before and after policy signals, by zone type" chart shows average changes in transaction volumes across different zone types over the past three years.

What This Means for Investors

- Physical risk ≠ financial risk until policy enters the scene. Investors must track not just floods, but regulatory rumblings.
- Engage with policy consultations early. Those who anticipate enforcement or rezoning moves can exit ahead of market repricing.
- High flood exposure isn't the main threat; policy-triggered devaluation is.

Impact of Flood Risk and Policy Factors on Transaction Volume

Transaction volume change before and after policy signals, by zone type.

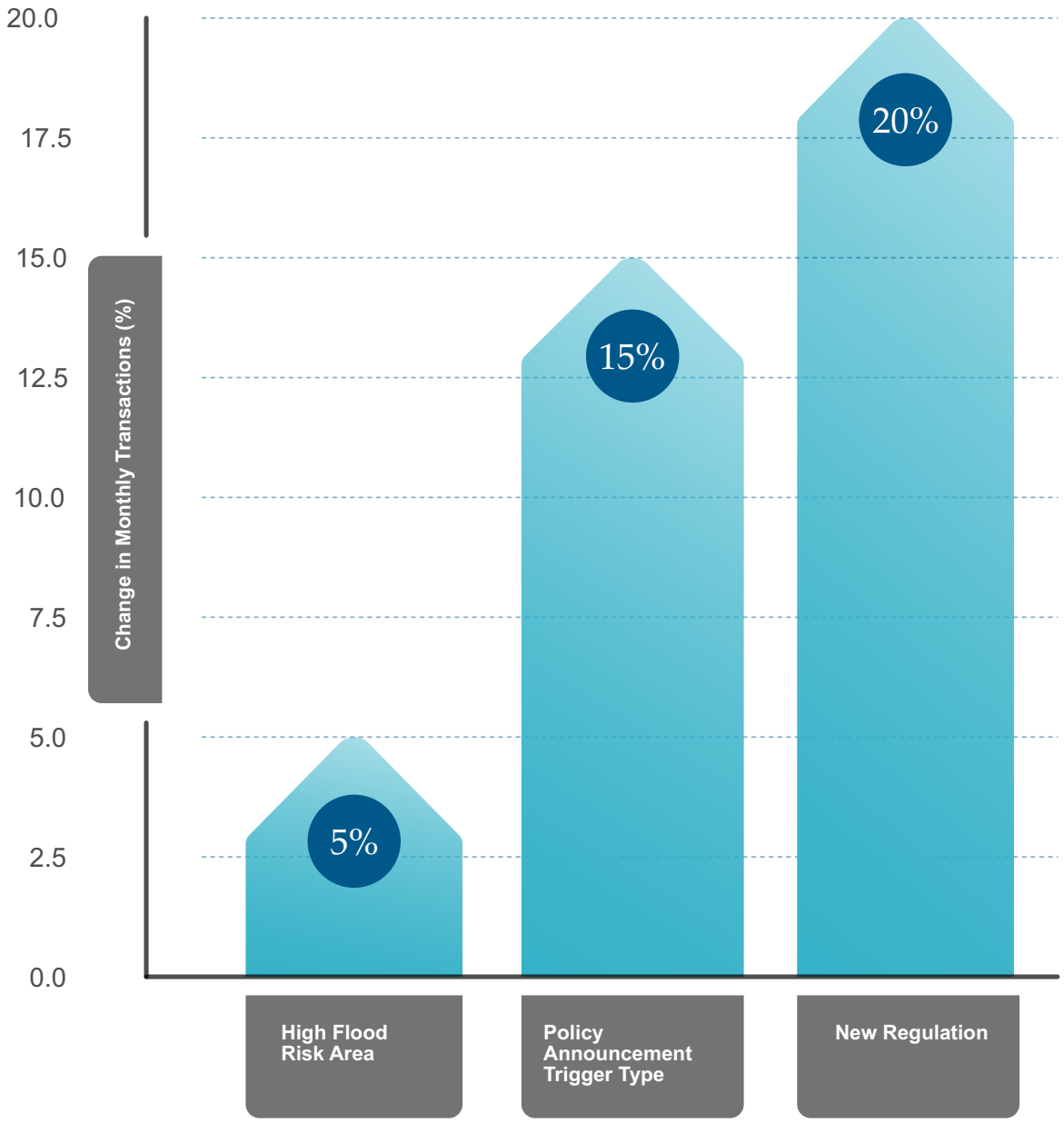


Figure 4: Transaction volume change before and after policy signals, by zone type

Volumes are shown as percentage change relative to the pre-signal average.
Results based on residential transaction data covering the period 2008 to 2025.

Calculation note: Baseline equals average monthly transactions in the six months prior to each policy announcement.

Insight 4: Without Enforcement, Resilience Doesn't Get Priced

Across the Thames Estuary, we identified dozens of assets and neighbourhoods that had invested heavily in flood resilience, energy upgrades, or climate-proofing. But the market didn't always reward them. In boroughs like Barking & Dagenham and Southend, where local enforcement of EPC standards or planning guidance was weaker, resilience measures had little effect on price uplift. Some EPC A-B homes earned just a 3–5% premium over less efficient peers. Contrast this with boroughs such as Greenwich or Tower Hamlets where resilience strategies were integrated with planning controls or landlord licensing schemes. Here, energy-efficient assets achieved double-digit price advantages.

The lesson is simple: Upgrades deliver value where governance and enforcement make them credible to buyers and lenders.

Markets need more than good intentions to shift. Resilience gets priced when buyers trust it, lenders can verify it, and enforcement makes it non-negotiable. We mapped this pattern using two variables: average Resilience Score (a composite indicator of climate adaptation, EPC, insurance coverage, and infrastructure strength) and observed price uplift for EPC A-B homes.

What This Means for Investors

- Do not assume resilience translates into pricing. It only does when there's regulatory or institutional follow-through.
- Focus on boroughs with active climate planning regimes; these areas are more likely to monetise resilience gains.
- Push for data transparency and third-party validation. Investors can help shape the enforcement ecosystem by demanding verification before allocating capital.

Impact of Enforcement Visibility on Price Uplift Across Resilience Levels

Resilience Score vs observed price uplift for EPC A–B homes, by local authority. Stronger enforcement aligns with stronger pricing.

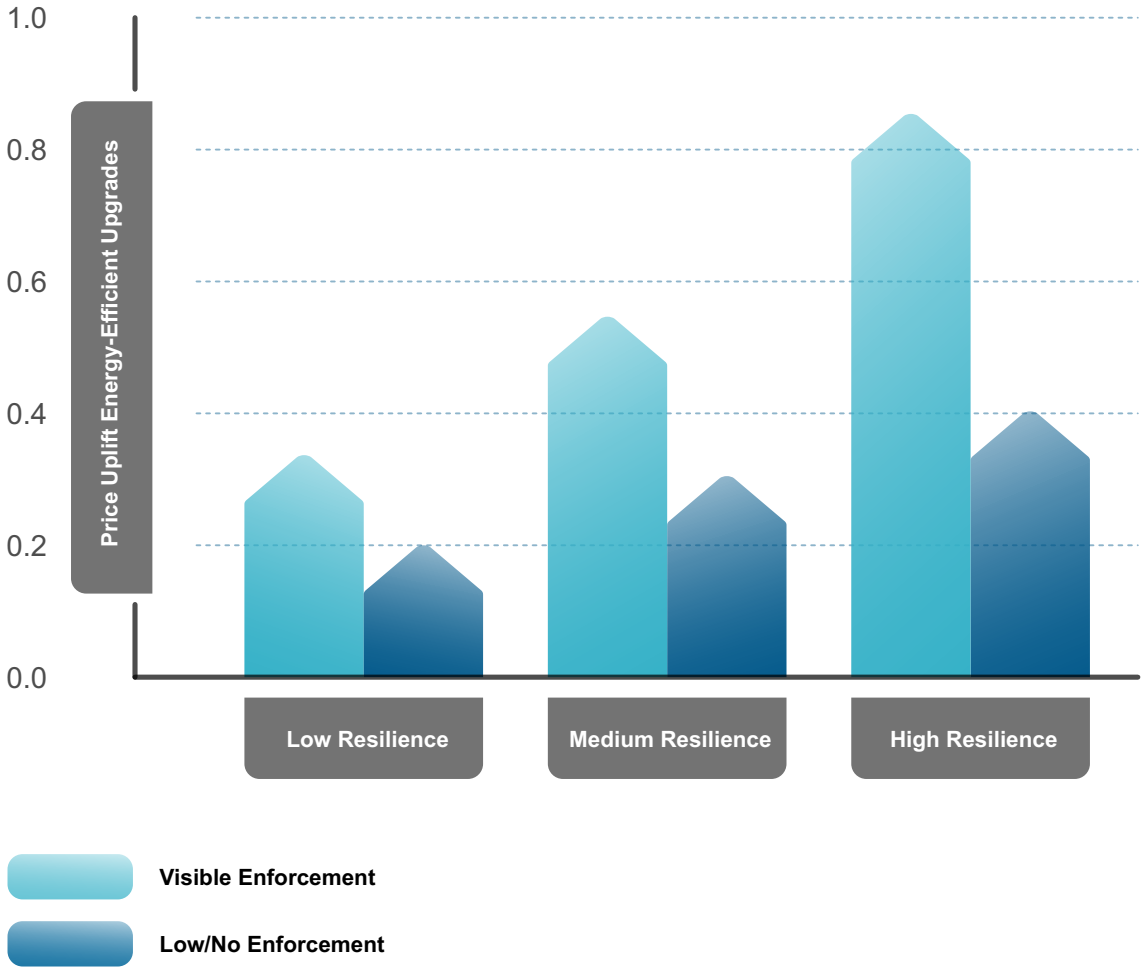


Figure 5: Market resilience and regulatory follow-through

Resilience score versus observed price uplift for EPC A–B homes by local authority. Stronger enforcement aligns with stronger pricing. Analysis period: 2008 to 2025.

Insight 5: Translating Risk into Valuation: How DCFs Price Climate Costs (Commercial vs Residential and BTR)

Purpose

This section connects our evidence to current valuation practice. Commercial investors already carry climate costs inside cash flows; residential markets often do not. Build-to-Rent (BTR) sits between the two, with professional underwriting but household exposure.

How DCFs currently capture climate costs (commercial practice)

- Insurance: treated as an operating expense; repriced at renewal. In high-risk zones we apply an Insurance Premium Gap (IPG) over the hold (see Method note).
- Retrofitting (capex): scheduled works (flood doors, plant relocation, fabric upgrades) as specific line items with timing and contingency.
- Void/retention: higher expected voids and/or lower retention where insurability, EPC or overheating risks are present.
- Rent growth: moderated where occupier costs or climate discomfort are material.
- Financing terms: interest margin or LTV haircuts where lenders flag climate exposure.

Residential vs Commercial (and BTR)

- Commercial: line items are explicit; yield/discount shifts are documented; lenders already query climate risk.
- BTR: converges toward commercial practice (portfolio-level capex, insurer engagement, lender due diligence).
- Owner-occupied / small PRS: costs are largely implicit; pricing adjusts late and unevenly; our results show the gap.

Mini-illustration (residential asset, 15-year hold)

- Baseline gross yield 5.0%; exit yield 5.25%.
- IPG £620/yr (PV = £7.4k @3%), retrofit capex £12k in Year 2, void +1.5 pp, exit yield +25 bps if unmitigated.
- With mitigation (retrofit delivered, verified): remove +25 bps exit penalty; void uplift trimmed to +0.5 pp; insurance stabilises.
- Effect: mitigated case recovers materially more NPV than the unmitigated path, demonstrating a resilience dividend when enforcement and verification are credible.

Implication

Treat insurance as a live operating cost, retrofit as timed capex, and resilience as a yield effect. BTR and commercial can implement immediately; the gap in owner-occupied stock is the opportunity and the risk.

5. What Investors Should Do

The findings from this study are diagnostic and directional.

They reveal a clear mismatch between the physical risks facing property assets in the Thames Estuary and the behavioural responses of the market. Investors still underestimate the catalytic effect of regulatory intervention and overestimate the ability of the market to self-correct around resilience. To navigate this emerging climate-risk frontier, we recommend five key next steps and each are rooted in data, and framed for immediate operational relevance.

Strategic Checklist for Real Estate Investors

Strategic Priority	What To Do Now	Why It Matters
1. Adopt RiskWeighted Net Present Value (RWNPV) in underwriting	Adjust investment models to factor in not just capex, but location-specific flood probability, resilience index, and EPC volatility.	Our RW-NPV model showed that some assets with high yield projections turned negative after factoring in unpriced flood exposure.
2. Actively monitor planning & EPC regulation updates	Build automated alerts or dedicated roles to track local consultations, policy white papers, and enforcement signals.	Transaction volumes dropped 11–15% after regulation announcements. Markets are reacting faster than expected.
3. Screen portfolios with climate adjusted lending criteria	Integrate geospatial flood layers and EPC risk ratings into credit assessment and pricing tools. Reprice or exit poorly rated assets.	Lenders ignoring EPC may soon face regulatory stress tests or underwriting scrutiny. This is becoming a material risk.
4. Avoid stranded asset exposure	Deprioritise investments in assets unlikely to meet EPC B or flood adaptation thresholds by 2030.	Properties with EPC D or worse will become legally unlettable or uninsurable, particularly in floodvulnerable areas.

Where This Is Already Happening

1. Institutional investors in London are now embedding EPC volatility into internal risk dashboards and starting to price retrofits into acquisition capex.
2. REITs and insurers are developing flood-adjusted scenario tools to stress-test medium-term asset viability.
3. Local authorities like Greenwich and Tower Hamlets are driving value through active climate enforcement and these are becoming visible investment advantages.

Closing Message to Fund Managers, Lenders, and REIT Boards:

Climate risk is not only a science issue. It's a timing issue.

Your portfolios may be resilient today but the market won't wait for water levels to rise before repricing. The repricing begins when policy triggers, buyer sentiment shifts, or insurance exits the market.

6. Policy Recommendations

For investment markets to price climate risk accurately, regulatory clarity and data transparency are essential. Investors cannot act on what is hidden, inconsistent, or delayed. Without strong signalling from government, climate-related mispricing will persist, and capital will continue to flow into vulnerable assets, many of which may be uninsurable or unlettable by 2030.

This report identifies three key areas where policy reform can unlock better risk-adjusted pricing and support a more resilient built environment.

1. Link EPC Ratings to Mortgage Pricing

At present, the UK mortgage market does not consistently reward borrowers for energy-efficient properties, nor penalise inefficient ones. Yet EPC ratings are a strong proxy for both carbon exposure and retrofit risk.

Policy Ask: Encourage lenders through Financial Conduct Authority (FCA) guidance and Prudential Regulation Authority (PRA) climate disclosures to adjust mortgage rates based on EPC ratings.

1. Lower mortgage rates for EPC A–B homes could incentivise buyers to prioritise greener assets.
2. Higher rates for EPC E–G homes would signal future retrofit liabilities and encourage divestment.
3. Portfolio-level stress testing by banks should be tied to EPC risk-weighting, as part of climate risk reporting frameworks (TCFD, ISSB).

2. Make Flood Risk Premiums Transparent

Many buyers, lenders, and investors still rely on outdated or oversimplified flood maps; often unaware of actual insurability constraints, recent claims data, or premium volatility.

Policy Ask: Require insurers and comparison sites to disclose indicative flood premiums at the postcode level.

1. This could be embedded into property listing portals (Rightmove, Zoopla) much like Council Tax bands or EPC scores.
2. Transparent flood pricing would shift buyer expectations and force earlier repricing of vulnerable assets.
3. Insurers should be incentivised to publish anonymised claims ratios by region to inform market sentiment.

3. Clarify TE2100 Implementation Timelines

The Thames Estuary 2100 (TE2100) plan is a critical infrastructure strategy but most of its adaptive pathways remain technically provisional, unfunded, or delayed.

Policy Ask: Publish a binding roadmap with delivery milestones, local council co-funding obligations, and planning integration.

1. Investors cannot factor in resilience benefits if they don't know when or where TE2100 measures will be delivered.
2. Clearer phasing would allow developers and asset managers to time acquisitions and upgrades more strategically.
3. Borough-level integration with Local Plans and Nationally Significant Infrastructure Projects (NSIP) would amplify investor confidence.

Summary Message to Policymakers:
Markets are willing to act but not in the dark.
When policy signals are clear, consistent, and enforceable, investment decisions align with resilience goals.

Climate risk isn't just about warnings. It's about mechanisms that convert knowledge into value.

7. Conclusion

Adaptation Is Investable When It's Visible and Enforceable

Our analysis of the Thames Estuary shows that markets move on policy clarity faster than on hazard maps. Where planning rules, lender expectations or insurance signals are visible and enforced, pricing adjusts. Where they are not, mispricing persists. The evidence is consistent across our event analyses and the worked example for Barking Creek to Thamesmead: flood exposure is already costing value through an implicit discount and an explicit insurance drag, together amounting to an estimated climate risk premium of around eight per cent in the residential market (see Method note in Section 3; Worked example in Section 4; Appendices A2, D2 and D3).

This is not a claim that amenity or waterfront value disappears. It is a claim that partial risk adjustment occurs only when consequences are credible and near term. In places where planning, lending or insurance signals sharpen, amenity premia narrow. In places where signals are weak, price inertia holds and the risk of abrupt repricing grows.

The findings convert directly into underwriting steps. First, treat the Insurance Premium Gap as an operating cost over the hold period and capitalise it within cash flows. Second, recognise physical exposure as a yield effect by applying a resilience adjustment to discount rate or exit yield, or by using the RW-NPV factor as a correction to headline value. Third, include explicit retrofit capex and a retention or void assumption where compliance risk is material. Fourth, phase scenarios to TE2100 delivery and local enforcement calendars so that benefits and costs do not arrive at once. Build-to-Rent and other institutional residential formats can implement these adjustments today; owner-occupied stock will follow more slowly, which is where the opportunity lies (see Appendices A2 and D2).

Screen exposure with flood layers, EPC status and local enforcement trackers. Reprice or exit assets that fail on two or more of these tests. Tilt towards boroughs where resilience is being delivered and audited, because that is where a resilience dividend is most likely to emerge. Monitor three lead indicators quarterly: indicative premiums, lender questions at valuation, and planning outcomes for resilience measures. These move before headline prices do.

Clearer TE2100 phasing, premium transparency and mortgage pricing that reflects EPC would narrow today’s mispricing and cut stranded-asset risk. The market is willing to act when the rules are clear. The sooner signals are published and enforced, the sooner capital will fund the right upgrades at the right locations (see Section 6).

Climate risk is already in the price; it is just not evenly in the price. The leaders will translate these signals into cash flows now, adjust yields now, and move before the market is forced to. Those who wait for price indices to catch up will be reacting, not allocating.

8. Appendices

Methodology Summary

How We Analysed Climate Risk and Investment Behaviour
Our research combines real-world transaction data, climate exposure mapping, and behavioural modelling to understand how UK real estate markets are (or are not) pricing climate risk with a specific focus on the Thames Estuary.

We used six core data sources:

- **Land Registry Transaction Data**: Over 250,000 commercial and residential property transactions from May 2008 – May 2025
- **EPC Register**: Energy performance ratings and upgrade status by property
- **Environment Agency Flood Zones**: Flood risk exposure (Zones 2, 3a, 3b)
- **TE2100 Planning Documents**: Local authority resilience commitments and policy phases
- **ONS & Census**: Socioeconomic controls to account for price variation
- **Insurance pricing signal:** postcode-level indicative premiums aligned to EA flood layers and Flood Re/ABI guidance, used to derive an annual Insurance Premium Gap (IPG) by sector.

What We Did:

1. **Mapped Exposure**
   We created a spatial overlay of all transactions with flood risk zones, EPC data, and TE2100 boundaries to identify which areas face the most significant climate risk.

2. **Modelled Market Behaviour**
   Using price trends, transaction volume, and EPC status, we looked at how buyers and sellers responded to climate hazards and regulatory signals especially after key announcements.

3. **Tested New Metrics**
   We introduced a "Risk-Weighted Net Present Value" (RW-NPV) model, which discounts future returns based on exposure to flood risk, poor energy performance, and resilience policy gaps.

4. **Compared Across Boroughs**
   We ranked all boroughs by their exposure, enforcement actions, and pricing behaviour to show where climate risk is mispriced, priced in, or avoided.

What This Means:

The results are not theoretical. They are built from real market behaviour. By tracking how investment flows have changed in high-risk areas and how buyers respond to regulation, we provide actionable insights for fund managers, REITs, and lenders seeking to future-proof portfolios. A more technical breakdown of data sources and models used is included in the Appendix.

Appendix A: Full Technical Methods

Expanded Explanation of Data, Models, and Analytical Techniques
This appendix outlines the technical processes and methodologies used to support the analysis presented in this report. While the main body is written for investment professionals, the details here reflect the robust academic and statistical rigour underpinning our conclusions.

A1. Data Sources and Integration

Land Registry Transaction Data (2018–2024)

- Source: UK House Price Index, downloaded quarterly
- Cleaned for outliers, non-arm's length transactions, and leasehold anomalies
- It was geocoded using ONS postcode lookup
- Residential transactions form the core analytical sample
- Commercial transactions are used for contextual charts and behaviour comparisons only

EPC (Energy Performance Certificate) Dataset

- Source: EPC Open Data Register
- Joined by UPRN and postcode to transaction-level data
- Flagged for EPC band (A–G), date of rating, and presence of improvements

Environment Agency Flood Risk Maps

- Layers used: Flood Zone 2, Flood Zone 3a, and 3b
- Mapped using QGIS 3.30 and linked to all postcodes and transaction locations
- Zonal overlays created to flag exposure types (e.g. tidal vs. fluvial)

Thames Estuary 2100 (TE2100) Planning Zones

- Extracted from Environment Agency and GLA planning documents
- Borough-level classification of policy activation status (early, ongoing, unfunded, etc.)
- Cross-verified with borough Local Plans and flood investment disclosures

Socioeconomic Control Variables

- Source: ONS and 2021 Census
- Variables used: average income, IMD quintile, urban density, housing tenure, bank rates from Bank of England (BoE)
- Controlled for in price models using fixed effects

A2. Analytical Models Used

Transaction Response Modelling

- Bayesian Structural Time Series (BSTS), Vector Autoregression (VAR), Elastic Net Regression,
- XGBoost, Random Forest, Impulse Response Functions, Granger Causality
- Dependent variable: inflation-adjusted price per square metre
- Key independent variables: flood risk zone, EPC band, TE2100 status, post-policy dummy
- Controlled for: location, property type, year, bank rates, and local income levels
- Robust standard errors used; tested for multicollinearity and heteroskedasticity
- Insurance Premium Gap (IPG, £/year**)** as an explanatory variable alongside flood zone and EPC; controls for property type, location and year fixed effects

Volumetric Analysis (Transaction Counts)

- Monthly transaction volumes analysed in flood-prone vs. resilient areas
- Event-study model used to identify breaks around policy announcements
- Chow test and Bai–Perron breakpoint tests applied

Resilience Pricing Assessment

- Matched-pair analysis used to compare similar properties in flood-exposed vs. non-exposed zones, controlling for EPC and neighbourhood
- Spatial Autocorrelation Tests (Moran's I) to ensure results were not due to cluster bias

Risk-Weighted Net Present Value (RW-NPV) Model

- Developed to simulate asset repricing under scenarios of:
  (a) flood risk premium increases
  (b) stranded EPC penalties
  (c) adaptation discount (when local resilience is visible and credible)
- RW-NPV = Base_NPV * (1 – risk_score_scaled)
- Risk adjustments were derived from historical volatility of flood zone resale values and known insurer thresholds for retreat
- Operating costs: insurance IPG as a recurring cost over the hold period; sensitivity tested at ±25% of baseline IPG

Worked Example Inputs and Calculation (Barking Creek–Thamesmead)

- Baseline price: £360,000 (median corridor sale 2022–2024)
- Exposure definition: EA Flood Zone 3 or modelled flood depth >1 m
- Implicit discount (ΔP): 6.1% after controls
  (OLS/Hedonic with location, type, EPC, income; robust SE)
- Insurance Premium Gap (IPG): £620/year (high-risk vs low-risk postcode sectors)
- Hold period: 15 years; discount rate: 3% (base), sensitivity at 2% and 5%
- PV(IPG): PVannuity = IPG × [(1 − (1+r)^−T) / r]
- Total CRP: ΔP × Price + PV(IPG) = £21,960 + £7,400 ≈ £29,400 (~8%)
- Indicative yield spread: ~0.40–0.45% based on typical gross yield range (4.75–5.25%)

Notes

Premiums are indicative by sector; results are directional for underwriting, not quotes for individual dwellings.

Robustness Checks

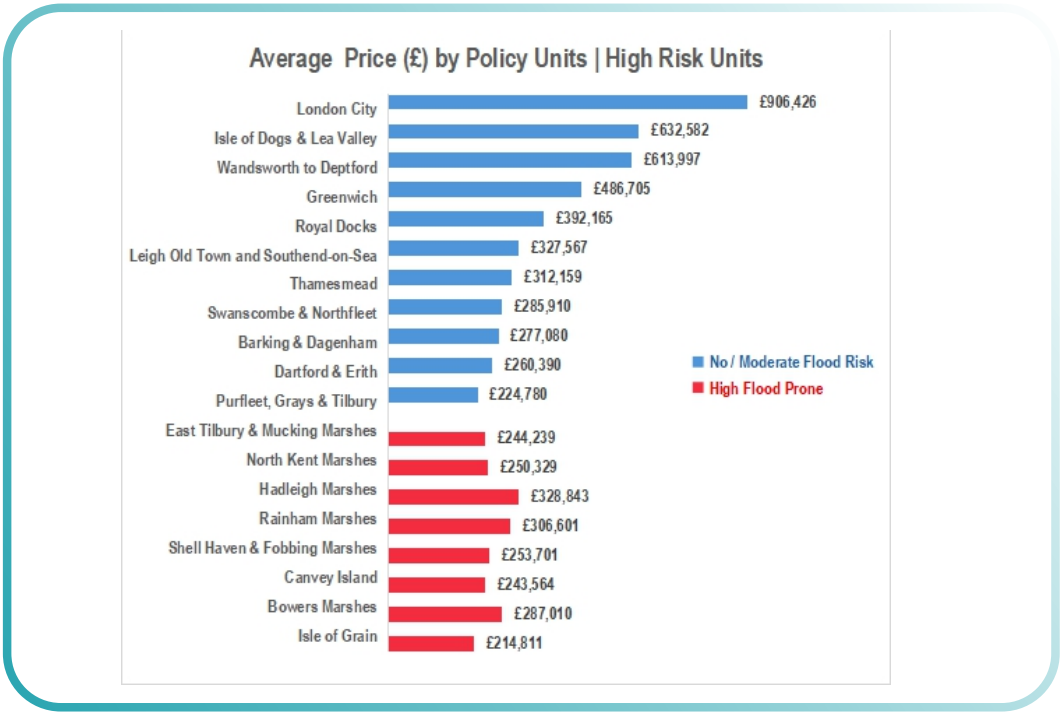
- Amenity control: added a continuous river-proximity variable and a waterfront frontage dummy
- Interaction test: Flood Zone × Waterfront to test whether amenity premia compress with exposure.
- Exclusion band: re-estimated models excluding transactions within 0–150m and 0–300m of the river to test sensitivity
- Policy/insurance conditioning: repeated estimates for areas with active planning signals and higher indicative premiums to observe premium compression
- Result: amenity premia persist; risk adjustment is partial and contingent on credible consequences (planning, lending, insurance)

A3. Limitations and Assumptions

- EPC data is known to have measurement inconsistencies, particularly pre-2015. Sensitivity checks were run excluding these years.
- Flood maps represent modelled risk, not observed claims data. Actual premiums were inferred using regression estimates and insurer disclosures.
- TE2100 policy implementation is still in flux; borough-level classifications rely on planning statements and public budget data as of April 2025.
- Property-level rental data was not available in all boroughs; where missing, modelled average yields were used to estimate RW-NPV.

A4. Software and Tools

- Analysis: Python (ElasticNetCV, Shapely, Sci-Kit Learn, Plotly), R (bsts, struccharge, vars, gwr, ggplot2)
- Spatial Mapping: QGIS 3.30, ArcGIS Pro
- Visualisation: Matplotlib, Plotly, Adobe Illustrator, ggplot
- Document Layout: Microsoft Word and Affinity Publisher



Controlled price effects and policy-signal responses are estimated using hedonic and event-study models; see Methodology (p.16) and Appendix A2.

Figure 6: Average residential sale price by TE2100 policy unit and flood-risk classification

Bars show mean achieved prices for residential transactions (2018–2024), grouped by TE2100 policy unit and categorised by flood exposure (no/moderate risk vs high flood-prone areas). Prices are shown in nominal £ terms prior to model controls.

Data Source: UK Land Registry Price Paid Data; EPC Register. Flood-risk classification aligned to Environment Agency flood zones.

This chart provides descriptive context only and is not itself evidence of climate pricing. It illustrates that headline prices can remain high in flood-exposed policy units, particularly in amenity-rich or regeneration areas. The analytical tests therefore do not rely on raw averages. Instead, prices are re-estimated using hedonic and matched-pair models that control for property type, size, location, EPC band and time effects (see Appendix A2).
The purpose of this figure is to motivate the need for controlled analysis and to demonstrate why flood risk cannot be inferred from headline prices alone.

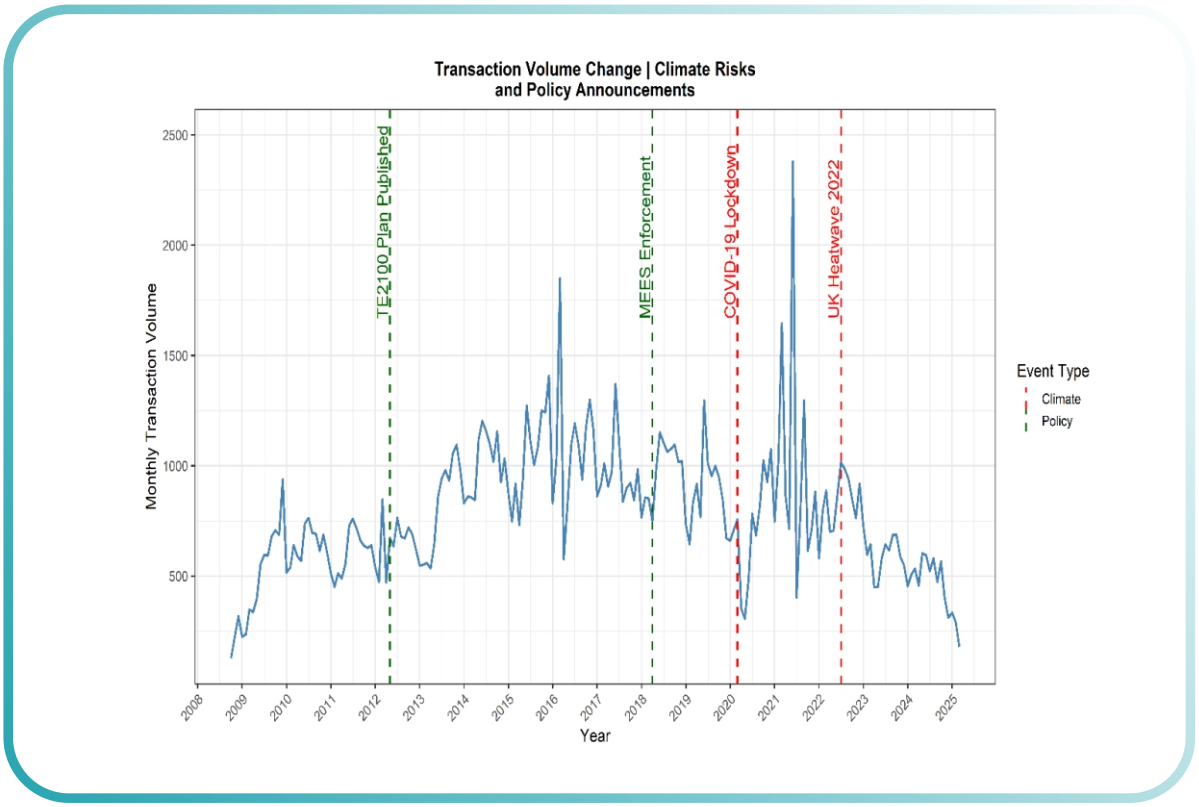


Figure 7: Transaction volume changes by risks and announcements

Note: MEES Enforcement (Minimum Energy Efficiency Standards) – April 2018

Data Source: EPC Certificates, UK Land Registry PPD Data

Figure 7 places residential transaction volumes in the TE2100 corridor alongside the timing of key policy announcements and climate-related shocks. Its role is contextual rather than inferential. The chart does not seek to establish causality by visual inspection; instead, it motivates the formal event-study and breakpoint analyses that follow.

Two types of signal are distinguished. Policy and regulatory interventions (shown in green) are events that were visible and actionable to market participants, such as the publication of the TE2100 Plan and the enforcement of MEES in April 2018. Climate shocks (shown in red), including COVID-19 and the 2022 heatwave, are exogenous disruptions that affect activity but do not, on their own, change the rules of market participation.

The contrast is instructive. Climate shocks are associated with short-lived volatility, whereas policy interventions coincide with more persistent shifts in transaction behaviour. This pattern underpins the study's central hypothesis, which is tested formally elsewhere: residential markets respond more decisively to enforceable policy signals than to hazard information alone.

Statistical significance of these volume shifts is assessed using event-study and structural break tests (see Appendix A2 and Appendix D3). The figure therefore provides the temporal logic for the analysis, not the evidence itself.

Appendix B: Flood and Resilience Data Sources

Overview of Datasets Used to Assess Climate Exposure and Adaptation Signals
This appendix lists the public and proprietary sources used to assess physical flood risk, resilience planning, and adaptation readiness across the Thames Estuary study area. All datasets were selected for reliability, national relevance, and investment applicability

B1. Flood Risk Datasets

1 Environment Agency – Flood Map for Planning (Rivers and Sea)

- https://flood-map-for-planning.service.gov.uk/
- National dataset classifying land into Flood Zone 1, 2, 3a, and 3b
- Used to determine physical exposure of residential and commercial postcodes
- Last updated: March 2024

2 Environment Agency – Risk of Flooding from Rivers and Sea (RoFRS)

- GIS shapefiles with probability levels: Low (<0.1%), Medium (0.1–1%), High (>1%)
- Used to estimate insurability and hazard-based risk premiums
- Downloaded via data.gov.uk
- Cross-checked with postcode centroid exposure using QGIS

3 Surface Water Flood Risk Maps

- Environment Agency's "Updated Flood Map for Surface Water (uFMfSW)"
- Layer used to account for urban drainage risks in boroughs like Barking & Dagenham
- Important in built-up zones not covered by fluvial or tidal zones
- Accessed via Environment Agency Spatial Data

B2. Thames Estuary 2100 (TE2100) Policy and Planning Documents

1 Thames Estuary 2100 Plan (Main Strategy Document)

- Source: Environment Agency
- https://www.gov.uk/government/publications/thames-estuary-2100-te2100
- Framework for adaptation investments across 17 London boroughs and the Estuary corridor
- Used to define spatial coverage and borough responsibility tiers

2 Te2100 Borough-Level Implementation Reports

- Local Authority Planning Sites and Core Strategies (2020–2025 updates)
- Example: London Borough of Newham's Flood Risk Management SPD
- Used to code boroughs as "active," "partial," or "lagging" in resilience signalling

3 Greater London Authority (GLA) Flood Risk Planning Guidance

- Supplementary documents on integrating TE2100 into Local Plans
- Sourced from: London.gov.uk and borough planning portals

B3. Additional Resilience Indicators

1 Flood Re and ABI Premium Guidelines (Indicative)

- Used to infer insurer withdrawal thresholds based on property flood frequency
- ABI (Association of British Insurers): https://www.abi.org.uk/
- Flood Re Scheme documentation: used for risk-pricing assumptions
- Premium estimates inform the IPG used in the main analysis; see Method note in Section 3.

2 Resilience Investment Disclosures

- Budget statements, planning proposals, and DEFRA resilience funding data
- Highlighted where public investment could offset future property depreciation
- Public sources include:
  (a) DEFRA Adaptation Funding Briefs
  (b) Local Government Finance Statements (2023–2025)

Appendix C: Literature References

Selected Sources Informing Analysis and Interpretation

1. Grantham Research Institute (2022). Climate Risk Pricing in UK Real Estate: Signals, Delays, and Data Gaps. London School of Economics
2. CBRE (2023). Climate Risk and Resilience in UK Property Markets: Valuation Trends and Investor Behaviour
3. Savills (2023). The Green Premium: Energy Ratings and Property Values in the UK
4. ClimateWise & Cambridge Institute for Sustainability Leadership (2022). Transition Risk Frameworks for Real Asset Investment
5. Environment Agency (2021). TE2100 Plan: Managing Flood Risk Through to 2100
6. UK Green Building Council (2024). Net Zero Carbon Buildings: Regulatory Gaps and Investor Signals
7. Urban Land Institute (2022). Climate Risk Disclosure and Underwriting in Europe: What Investors Need to Know
8. Bank of England (2023). Climate Biennial Exploratory Scenario (CBES): Systemic Real Estate Exposure Pathways
9. McKinsey & Co. (2023). Adapting Infrastructure and Real Estate to Climate Realities: A Business Case
10. Association of British Insurers (2023). Flooding and Home Insurance in the UK: Emerging Pricing Realities

Appendix D: Extended Figures and Tables

Supporting Tables and Visuals to Supplement the Main Report

D1. Key Variables: Definitions, Scoring, and DATA Sources

Variable	Description	Source
epc_score	Energy Efficiency Rating (EPC letter mapped to numeric scale A=1 to G=7)	EPC
emissions_score	Environmental Impact Rating (mapped from ENVIRONMENT_IMPACT_CURRENT EPC field)	EPC
flood_zone_score	Assigned as 3 (FZ3), 2 (FZ2), or 0 (not in flood zone)	EA Flood Map
composite_risk _ score_raw	Sum of EPC + Emissions + Flood Score (range: 2–17)	Constructed
composite_risk_ score_scaled	Scaled composite from [2, 17] → [1, 10]	Min-max

Notes:

- EPC Data – Energy Performance Certificate ratings and Environmental Impact Scores sourced from the UK EPC Register. Ratings A–G converted to numeric scale for modelling.
- Flood Zone Data – Flood Zone classifications sourced from the Environment Agency Flood Map for Planning (Rivers and Sea).
- Scoring Logic – Composite risk scores combine EPC efficiency, environmental impact, and flood risk, enabling multi-factor risk assessment.
- Scaling Method – Min–max scaling applied to raw composite scores to normalise into a 1–10 risk index, facilitating comparability across assets.
- Interpretation – Higher scaled scores indicate higher combined climate and efficiency risk; lower scores indicate better performance/resilience.

D2. Full RW-NPV Borough Rankings (Flood-Exposed vs. Resilient Boroughs)

Borough	Avg. EPC Band	% Properties in Fz3	TE2100 Policy Status	RW-NPV Adjustment (%)	Resilience Pricing Signal
Southwark	C	18.2%	Active	-4.2%	Weak
Barking & Dagenham	D	35.6%	Partial	-9.5%	Absent
Tower Hamlets	C	22.1%	Active	-3.9%	Moderate
Newham	D	41.4%	Lagging	-12.7%	None
Greenwich	C	25.3%	Partial	-6.8%	Patchy
Westminster	C	11.5%	Active	-2.1%	Strong
Havering	D	32.0%	Lagging	-10.2%	None
Wandsworth	C	17.3%	Active	-3.4%	Moderate
Lewisham	D	24.5%	Partial	-5.7%	Weak
Lambeth	C	15.6%	Active	-3.2%	Moderate

Notes:

- RW-NPV is the risk-adjusted net present value, calculated by applying risk premiums based on flood exposure, EPC penalty risk, and policy enforcement lags.
- FZ3 refers to Flood Zone 3 exposure based on Environment Agency data.
- “Resilience Pricing Signal” is based on matched-pair and spatial lag models.

D3. RW-NPV Sensitivity – Impact of EPC Band and Flood Risk Overlay

Scenario	Average Price (£)	RW-NPV (%)	Change vs. Market Price
EPC A or B, Not in Flood Zone	£570,000	+0.6%	£573,420
EPC D, In Flood Zone 2	£510,000	-4.8%	£485,520
EPC F, In Flood Zone 3b	£430,000	-13.9%	£370,230

Insight:

Properties with poor EPC ratings in severe flood zones could face a value erosion of over £50,000, even in prime London boroughs.

D4. Transaction Volume Drops Post-TE2100 Announcements

Zone	Pre-Policy Avg. Monthly Transactions	Post-Policy Avg.	% Change
Active Boroughs	420	378	-10.0%
Lagging Boroughs	395	310	-21.5%
Non-TE2100 Boroughs	440	436	0.9%

About the Authors

Oluwaseun Ajayi PhD
Principal Investigator
Seun is an award-winning real estate academic leader with a focus on climate risk, investment strategy, and sustainable development. He is affiliated with global research projects in South Africa, Germany, Nigeria and the UK.

Farai Mlambo PhD
Co-Investigator
Farai is a senior lecturer and quantitative modelling expert at the University of the Witwatersrand. His work focuses on geospatial finance, urban resilience, and causal inference using high-frequency property market data.

Arti Rawat
Data Scientist
Arti is a computational researcher with expertise in machine learning, asset-level risk analytics, and climate modelling. She supported the RW-NPV simulation, SHAP interpretation, and modelling pipeline.

Paulinus Ugwu
Research Analyst
Paulinus is a scholar with expertise in risk-adjusted pricing, and spatial regulatory analysis. He contributed to the enforcement policy mapping and asset-level correlation modelling.

Contact

To learn more about this research or to request access to datasets and appendices, please contact:

Oluwaseun Ajayi PhD — luseunajayi@gmail.com
IPF Secretariat — ipfoffice@ipf.org.uk
www.ipf.org.uk

RESEARCH

Investment Property Forum
R+ Building, 2 Blagrove Street,
Reading, Berkshire
RG1 1AZ

Email: ipfoffice@ipf.org.uk
Web: www.ipf.org.uk