Real Estate, Sustainability, and Climate Risk

Real estate has a significant impact on climate change and faces increasing climate risks. The construction and operation of buildings produce substantial CO2 emissions, but the industry can also be part of the solution.

This chapter explores the relationship between real estate and sustainability, examining both the financial considerations of energy efficiency and the physical climate risks facing the industry.

Real Estate's Environmental Impact

Major Contributor

The real estate sector accounts for 30-40% of global energy demand and greenhouse gas emissions.

Construction Emissions

Cement and concrete production emits significant CO2 during building construction.

Operational Impact

Buildings emit CO2 through gas heating and electricity consumption during use.

Change Potential

The industry has substantial potential to reduce climate risks through improved practices.

Market-Based Environmental Measures (Others exists in several countries)

BREEAM (1990)

First environmental performance yardstick for buildings, established in the UK.

LEED (1998)

US-based certification system with four levels from Certified to Platinum.

Green Star

Australian system measuring performance across nine environmental categories.

GRESB

Portfolio-level benchmark measuring energy performance of property companies and funds.

Corporate Sustainability Drivers

Corporate

Companies choose sustainable buildings as part of their social ESG responsibility policies. ESG = Environmental, Social and Governance.

Workforce Pressure

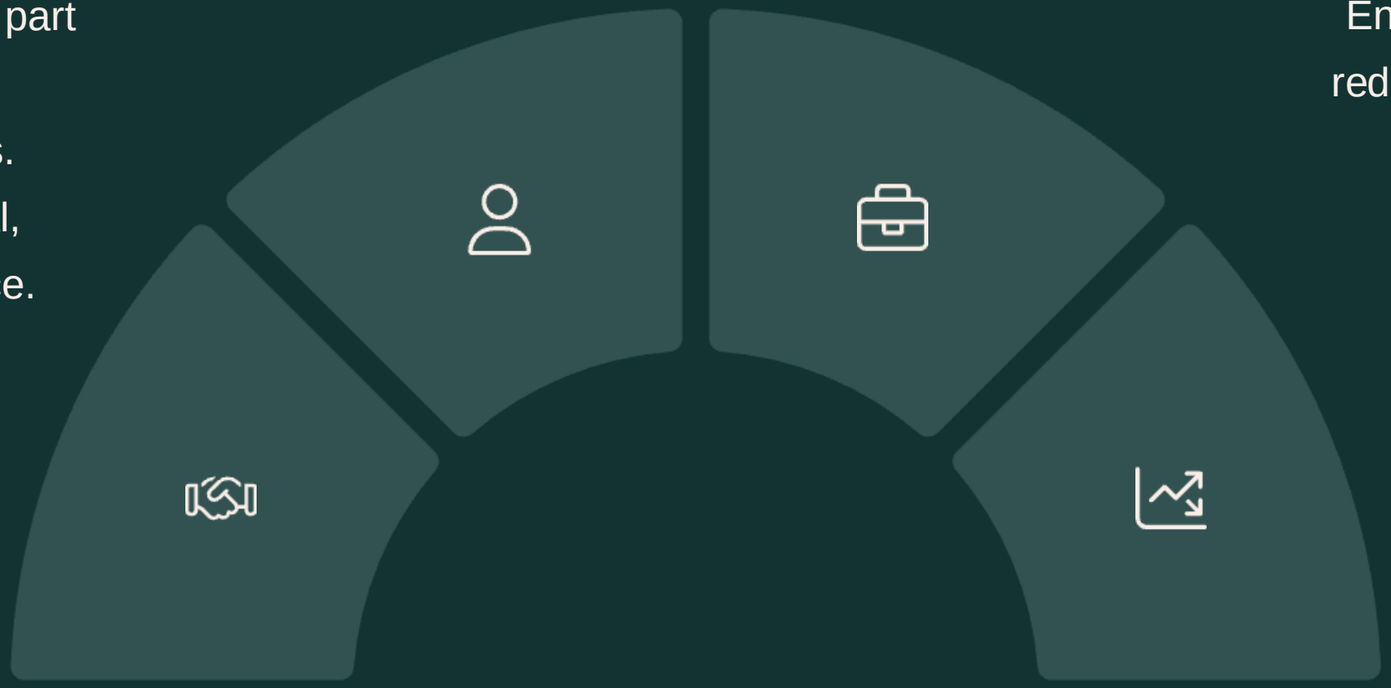
Employee expectations drive drive companies toward sustainable workplaces.

Talent Attraction

Sustainable buildings help attract top talent in competitive markets.

Stable Cash Flow

Energy-efficient buildings reduce exposure to volatile energy prices.



Institutional Investor Focus

ESG Policies

Energy performance is a cornerstone of institutional investors' Environmental, Social, and Governance policies.

Portfolio Assessment

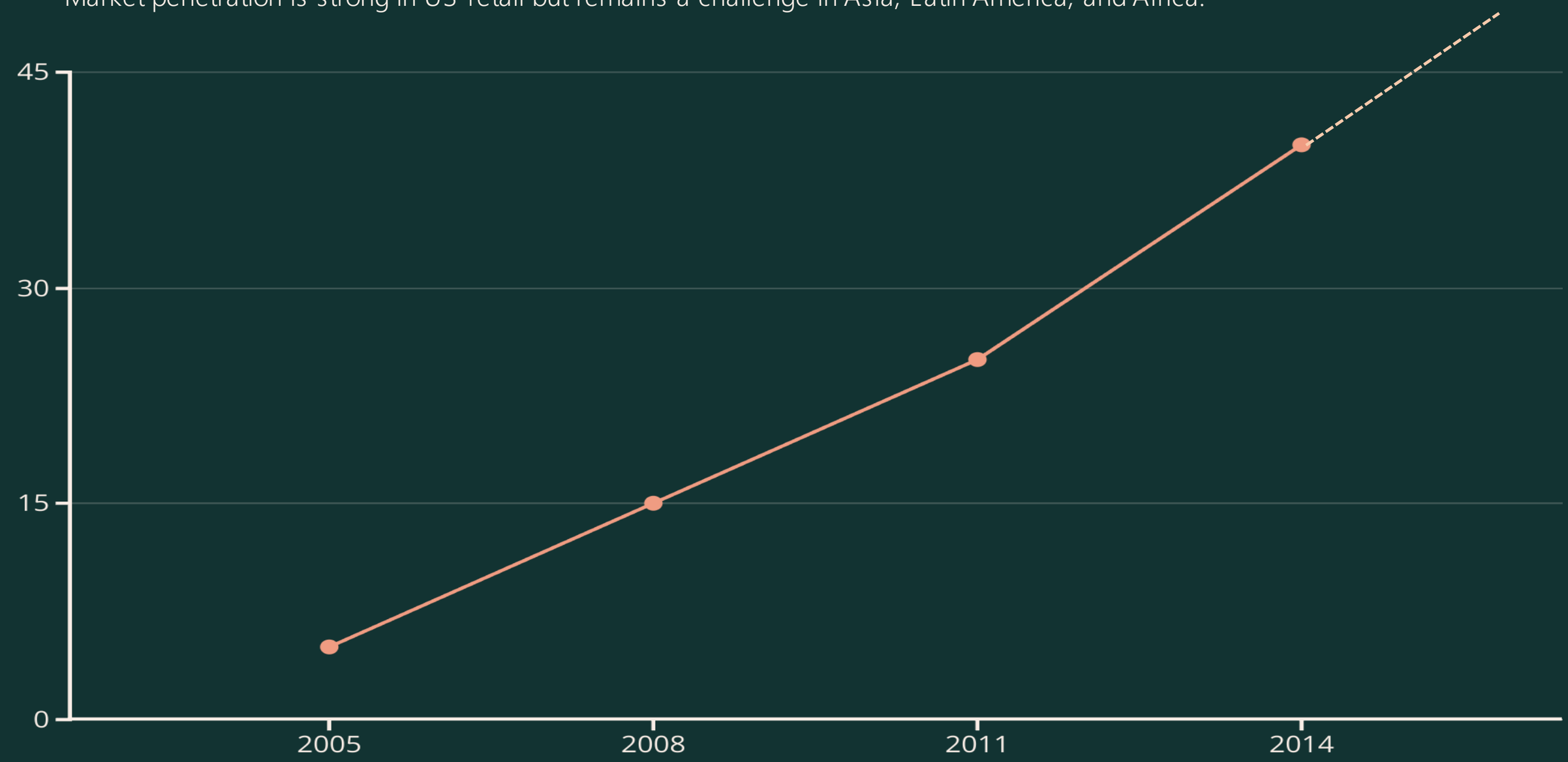
Investors use tools like GRESB and CRREM to evaluate sustainability performance of property investments.

Engagement Strategy

Information drives engagement with property companies to improve environmental performance.

Market Penetration (%) of Green Certification

LEED certification in the US office market rose steadily from just 5% in 2005 to 40% in 2014 and continues to grow. Market penetration is strong in US retail but remains a challenge in Asia, Latin America, and Africa.



Government Regulatory Approaches

Carbon Tax

Makes CO2 emissions expensive, allowing market forces to drive emission reductions.

Cap-and-Trade

Sets emission limits and allows trading of emission permits between companies.

Subsidies

Provides financial incentives for green investments, though effectiveness varies. This may include tax credits or property tax reductions.

Building Codes

Prescribes minimum energy efficiency standards for new construction.

Transition Risk for Property Investors

Stranded Assets

Buildings that fail to meet evolving standards risk becoming obsolete.

Brown Discount

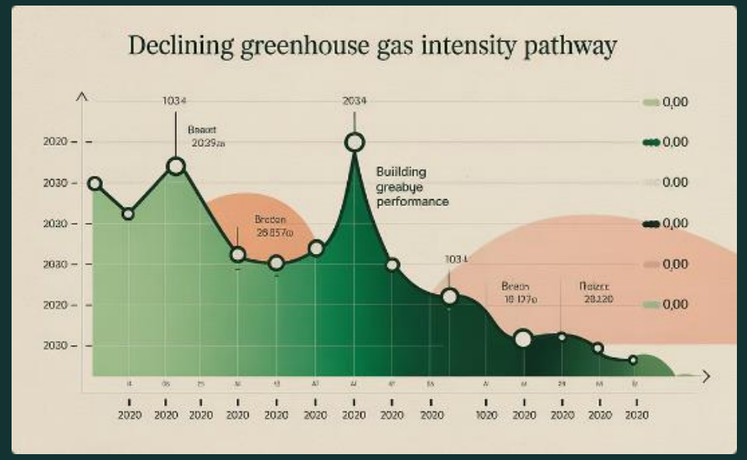
Non-green buildings may only be rentable at significant price reductions.

Regulatory Pressure

Stricter government regulations increase compliance costs for older buildings.

The CRREM (Carbon Risk Real Estate Monitor) Tool for Transition Risk

[CRREM Tool: roadmap for the decarbonisation of real estate]



Risk Assessment

CRREM provides a pathway to the 2050 2050 energy efficiency target based on Paris climate goals.

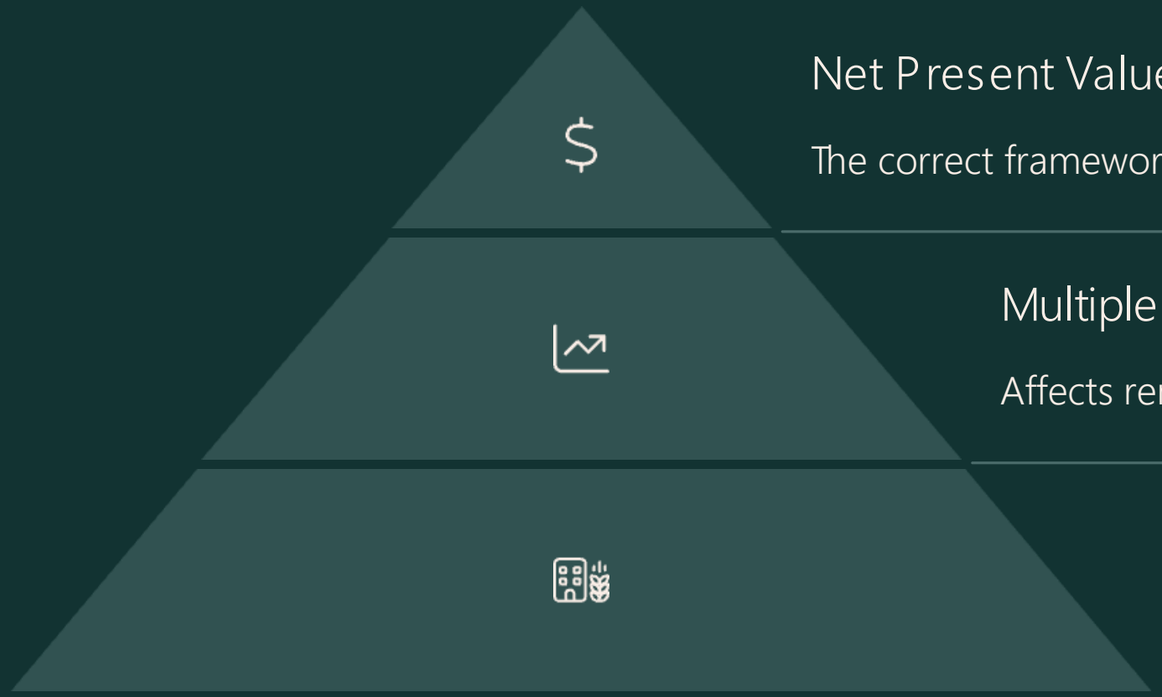
Decision Support

Helps investors determine when buildings will face transition risk and plan refurbishments.

Implementation

Used by leading institutional real estate owners globally to manage transition risk.

Financial Value of Energy Efficiency



Net Present Value

The correct framework for evaluating energy investments

Multiple Value Drivers

Affects rents, occupancy, costs, and discount rates

Building Performance

Higher energy efficiency typically increases financial value

Building owners should use the net present value rule to evaluate energy efficiency investments, not simple payback period. This accounts for all cash flow effects and the time value of money.

Evidence: Green Building Premiums from Research

6%

Average Rental Premium

Green buildings command higher rents across markets.

8.2%

Residential Premium

Green homes see significant rental advantage.

5.4%

Commercial Premium

Offices and retail spaces benefit from certification.

7.6%

Sales Value Premium

Green buildings sell for more than conventional ones.

Risk Reduction Benefits

Improved Liquidity

Green properties sell faster, especially in down markets.

- Shorter time on market
- Broader buyer interest
- More stable transaction volume

Stable Occupancy

Higher and more consistent tenant retention rates.

- Lower vacancy risk
- Reduced turnover costs
- More predictable cash flows

Lower Cost of Capital

Reduced financing costs for green buildings.

- 24-29 basis points lower mortgage rates
- 35-40 basis points lower cost of equity
- 34% lower chance of mortgage default

Timing Energy Efficiency Investments

Evaluate Technology

Consider current efficiency of green building technology

Make Decision

Invest now if discount rate exceeds technology improvement rate

Compare Rates

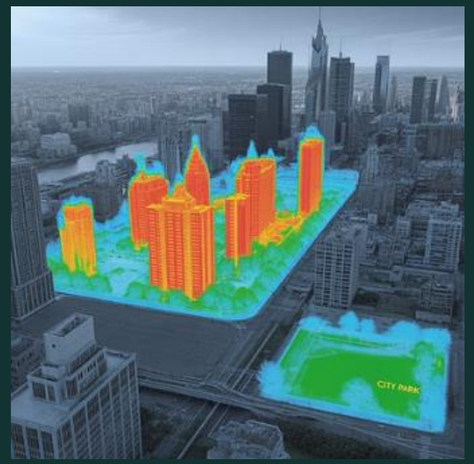
Weigh discount rate against speed of technological improvement

Consider Building Cycle

Align with natural maintenance/redevelopment schedule. Retrofits are often done after the loss of a major tenant while the building is fully or partially vacant.

Physical Climate Risk and Real Estate





Physical climate risk is both specific and systematic. It can affect individual properties differently even at small distances but also adds an undiversifiable layer of risk to all real estate investment.

The Big Wet Climate Risks

Rising Sea Levels

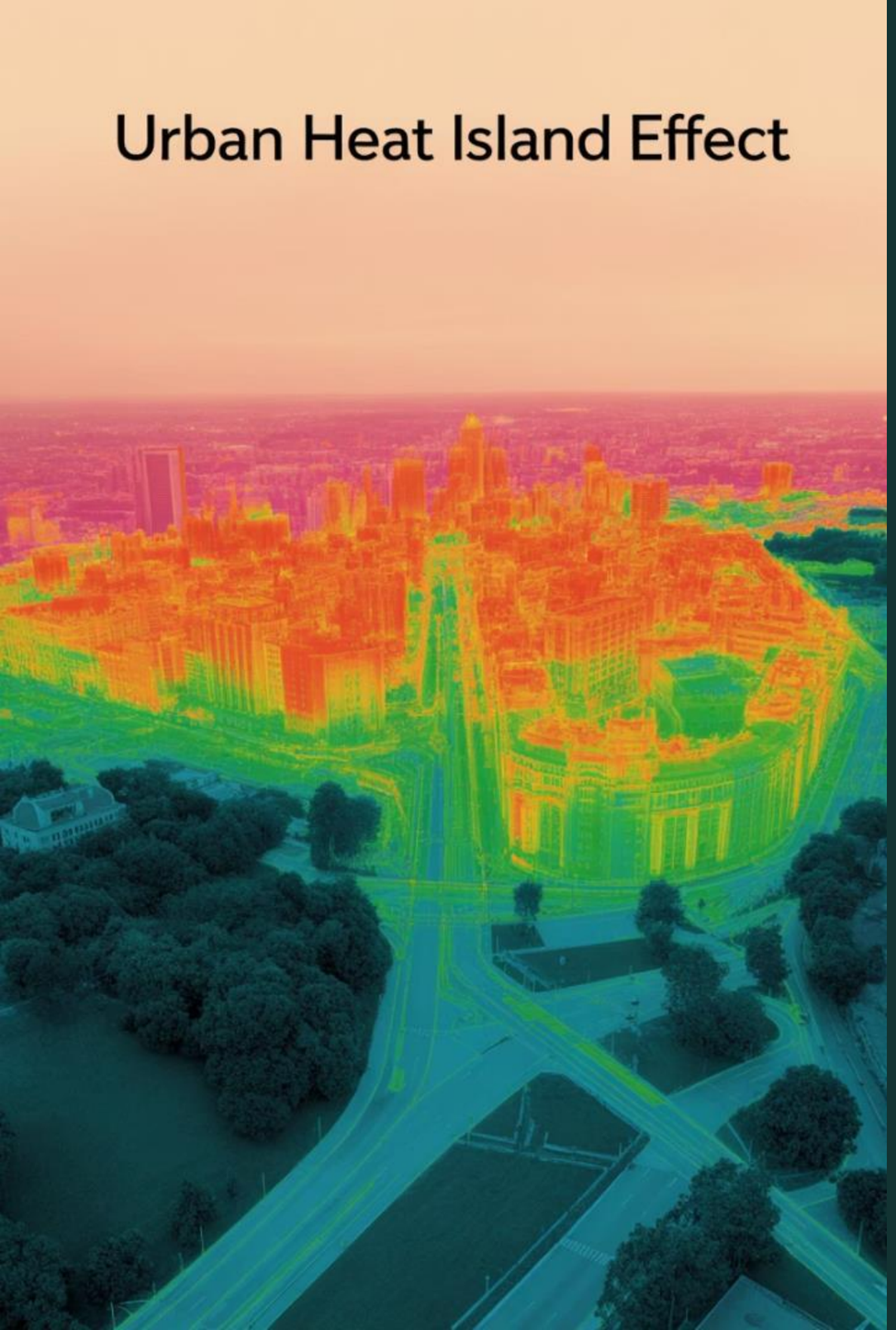
Already up 35cm globally, projected 40-100cm by 2100 even with Paris agreement compliance.

River Flooding

Changing rain patterns create more unpredictable and severe flooding events.

Hurricanes/Typhoons

Increasing in frequency, severity, and geographic range due to warming oceans.



Additional Physical Climate Risks

Wildfires

Unprecedented frequency in traditional and new locations due to longer, more severe droughts.

Heat Stress

Urban heat islands intensify impact, affecting health and increasing energy demands.

Soil Subsidence

Drought creates unstable soil, destabilizing buildings and infrastructure.

Climate Risk Measurement Tools

Government Maps	FEMA flood maps, wildfire risk zones, often limited in detail and lag the market, so they are generally out of date.
Financial Providers	Moody's, SwissRE, S&P Global, MSCI, Bloomberg offering climate risk scores.
Specialized Services	ClimateCheck, FirstStreet Foundation, Jupiter Intelligence, Sustainalytics
Limitations	Low correlation between different providers' risk scores, inconsistent methodologies

Effects of Physical Climate Risk

First Order Effects

Immediate physical damage and business disruption, largely insurable but with rising premiums.

Second Order Effects

Medium-term impacts on property values, occupancy rates, and regional economies.

Third Order Effects

Long-term large-scale relocation of people and businesses from repeatedly affected areas.

Insurance Challenges can significantly lower property values

Changing Risk Profiles

Climate change makes risks less predictable and more frequent.

- Higher probability of events
- Greater severity of damage
- New locations affected

Market Withdrawal

Insurance companies pulling out of high-risk areas.

- California wildfire zones
- Coastal flood zones
- Hurricane-prone regions

Financing Impact

Property financing depends on insurance availability.

- Collateral requirements
- Loan-to-value restrictions
- Development feasibility

The Path Forward is challenging

Financial Value

Energy efficiency investments generally add value and are good business opportunities.

Timing Matters

Delay only makes sense when technology improvement outpaces discount rate.

Risk Management

Physical climate risk requires diversification and adaptation strategies.

Collective Action

Avoiding the "tragedy of the commons" requires industry-wide commitment to sustainability.