REALPAC CAGBC Canada Green Building Council

Valuing the Future

A Roadmap for Integrating Climate-Related Risk Factors into Canadian Commercial Real Estate Valuation

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Executive Summary

The Canadian commercial real estate industry is at a pivotal moment.

Disruptions from climate change and shifts in global capital markets, tenant expectations, and regulations are redefining how asset value is determined.

Academic research shows that green certifications and higher energy performance ratings have historically been associated with modest rent and value premiums, particularly in earlier stages of adoption. In practice, however, these premiums are often difficult to isolate, particularly in mature markets where sustainability has become a baseline expectation.

While appraisers consider the impact of major HVAC equipment upgrades in their valuations (through lower utility costs and higher net effective rents), they are not systematically considering climate-related risks. This is primarily due to deficiencies in standards, data systems, benchmarks and methodologies - as well as different perspectives on the impact climate-related risks have on asset value.

As awareness, data, and benchmarks around climate-related risks continue to develop, their impact on asset valuations is likely to be reflected in cash flow durability, capital expenditures, leasing risk, and liquidity rather than in standardized valuation premiums or discounts. It is becoming increasingly clear: valuations that ignore significant climate-related risk factors may underestimate capital investment, credit exposure and liquidity risks.

Internationally, the latest edition of the International Valuation Standards (IVS), effective January 31, 2025, sets a new benchmark by requiring valuers to consider significant sustainability factors in determining value. While the Appraisal Institute of Canada (AIC) has not yet incorporated these updates through the Canadian Uniform Standards of Professional Appraisal Practice (CUSPAP), doing so would enhance alignment with global standards and strengthen the credibility of Canadian valuation practices.

This report offers a roadmap to ensure valuations remain accurate, relevant, and reflective of climate-related risks affecting the Canadian commercial real estate industry.

Roadmap: A Summary of Recommendations

The roadmap outlined in this report includes the following steps, with the lead organization(s) indicated in brackets.

1. Introduction

Purpose

The purpose of this report is to:

1) **Identify the current market and standards landscape around climate-related risks and CRE asset valuations in Canada, and**

2) **Provide a roadmap for incorporating climate-related risks into Canadian CRE asset valuations in the future**

REALPAC and CAGBC have developed this report in collaboration with a range of owners and appraisers from across Canada.

Audience

The primary audience for this report includes building owners and appraisers operating in Canada.

Incorporating climate-related risks into valuations will affect:

- Decision-making by owners across development, asset management, and investment activities.
- Appraisers' professional practices and the services they provide to building owners.

Context

The foundational principle of real estate valuation is to reflect the actions and motivations of market participants.[1]

For decades, these motivations were understood through a relatively stable lens of location, building quality, and tenant creditworthiness. Today, that lens is being fundamentally reshaped by two powerful, interconnected forces: a global reorientation of capital, tenant demand, and regulations toward low-carbon assets (transition climate risk), and the new, non-negotiable reality of climate change (physical climate risk).

For building owners, these climate-related risks are no longer abstract environmental concerns but increasingly material financial considerations that will influence asset liquidity, operating costs, insurability, and long-term value.

For the Canadian valuation profession, understanding and integrating climate-related risks into their appraisals is not a matter of choice, but an imperative for maintaining relevance and accuracy.

2. Climate-Related Risks - Overview

Climate-related risks refer to the potential negative effects of climate change on an entity.

The Task Force on Climate-related Financial Disclosures (TCFD) identified two main types of risks [2] in the context of commercial real estate:[3]

1) risks related to the transition to a lower-carbon economy, i.e., Transition Risks and
2) risks related to the physical impacts of climate, i.e., Physical Risks.

TRANSITION RISK

Transition risk is the risk of building obsolescence due to the shift to a low-carbon economy. Transition risks can result from factors such as changes in the regulatory landscape, reduced resource availability, increased insurance costs, potentially higher taxes and fines, and reputational and market shifts.

- **Mitigation** refers to actions taken to reduce greenhouse gas emissions and reduce transition risk.

PHYSICAL RISK

Physical risk is the risk of building damage and negative impact on tenants due to climate-related factors. Physical risk can be short-term (acute), such as damage from extreme storms, or longer-term (chronic), including threats from rising sea levels or increased temperatures.

- **Adaptation** refers to actions taken to proactively address the safety and comfort of tenants and reduce physical risk.

Climate-related risks in commercial real estate occur at an asset and portfolio level.

They are quantified through metrics such as energy use intensity, greenhouse gas intensity and climate value at risk, and mitigated through management actions such as asset capital plans, carbon transition plans, physical risk assessments/plans and corresponding measures.

The Global Shift in Capital, Tenant Demand & Regulations

CAPITAL ALLOCATION

The flow of global capital is undergoing a systemic transformation. Major institutional investors, pension funds, and sovereign wealth funds are no longer treating sustainability criteria as a peripheral concern but as a pillar of their investment strategy and fiduciary duty. This is not driven by altruism, but by a sophisticated understanding of risk and long-term value creation. A recent global survey of institutional investors found that they are increasing their allocation to low-carbon assets.[4] Most large institutional investors in Canada are reporting on their GHG emissions and have decarbonization targets in place for their portfolios.[5] This redirection of capital means that buildings with strong climate-related risk credentials are not just "nice to have"; they are becoming the preferred assets for the world's largest and most influential pools of capital. This preference will directly affect liquidity and pricing, as a deeper, more motivated pool of buyers competes for a limited supply of high-performing assets.

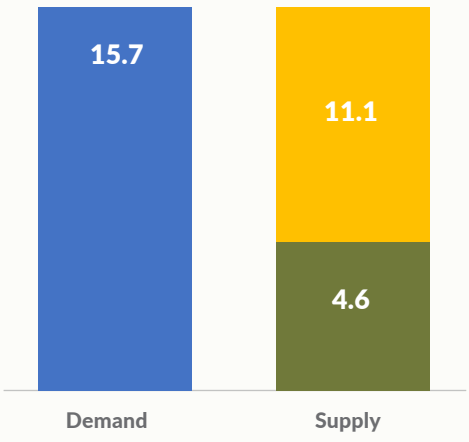
TENANT DEMAND

This shift in investor demand is mirrored on the income side of the ledger by an equally powerful trend in tenant demand. A growing number of multinational corporations and blue-chip tenants have set corporate net-zero carbon commitments and are making decarbonization a non-negotiable criterion in their leasing decisions.[6,7] One study from JLL (Figure 1) shows that the demand for low-carbon, sustainable office space from now until 2030 will be much higher than what is projected to be available in the market.

Many of these same multinational and blue-chip tenants are also committed to sourcing up to 100% of their electricity from renewable energy, including firms like TD Bank, PWC, Deloitte, Walmart, Nike, Ikea, Apple, Microsoft, and Google.[8,9]

Figure 1

Low carbon occupational requirements vs development pipeline, 2024 – 2030[7]



~70%

Unmet Demand

For every 3 square metres of global demand for low-carbon, sustainable office space, less than 1 square metre is currently in the pipeline.

The convergence of these two forces - investor demand for low-carbon assets (capital) and occupier demand for low-carbon spaces (income) - creates a powerful, self-reinforcing cycle for many large investment-grade assets. When the most active and well-capitalized buyers and the most desirable tenants are systematically favouring one type of asset over another, any valuation that fails to account for this preference is no longer a true reflection of the market. It is an opinion based on an outdated and incomplete set of value drivers.

TRANSITION RISK

THE REGULATORY MANDATE

The Government of Canada and its key financial oversight body, the Office of the Superintendent of Financial Institutions (OSFI), have firmly placed climate-related risks on the agenda for the nation's financial sector. OSFI's Guideline B-15: Climate Risk Management is a landmark piece of regulation that compels federally regulated financial institutions — particularly major banks and insurance companies, along with certain federally regulated pension plans — that are significant providers of debt and equity capital for commercial real estate to identify, measure, manage, and disclose their climate-related financial risks.[10]

This guideline is not abstract. It requires these institutions to develop and implement concrete Climate Transition Plans and to integrate climate-related risks into their core governance, risk management, and internal control frameworks.[10] This pressure can flow through to property owners as lenders increasingly incorporate climate-related risk into underwriting and portfolio management. As a result, when assessing a mortgage application for a commercial building, a bank may consider factors such as the property's emissions profile, energy performance, and exposure to future climate policy, including carbon pricing or building performance standards. A building with a high carbon footprint represents a higher transition risk to the lender, which could translate into less favorable loan terms, a lower loan-to-value ratio, or even a refusal to finance.

Other regulations, such as Codes (e.g., BC Energy and Zero Carbon Step Code), Energy Performance Ratings (e.g., Bill 41 in the Province of Quebec) and Building Performance Standards (City of Vancouver, Toronto) also present material risks and opportunities for commercial real estate owners.

KEY TAKE-AWAY

TRANSITION RISK IMPACTS

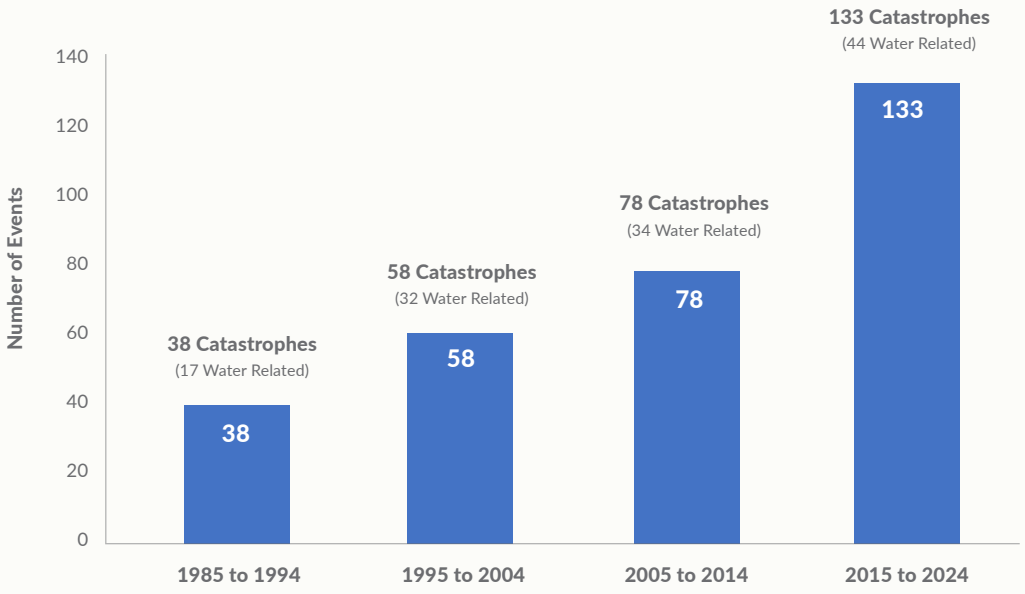
"Green Assets" with lower emissions and limited/no fossil fuel combustion will be better prepared for transition risks and can expect lower impacts on OpEx, CapEx, rent, and vacancy.

"Transitioning Assets" with higher emission profiles and fossil fuels as a primary heating source will be less prepared for transition risks and can expect a higher impact on OpEx, CapEx, rent, and vacancy.

The Tangible Costs of a Changing Climate

The financial impact of physical climate risk in Canada has moved from the theoretical to the tangible. The frequency and severity of extreme weather events have escalated dramatically. Insured losses from such events surged from an annual average of $405 million between 1983 and 2008[11] to $8.5 billion in 2024,[12] driven by catastrophic losses in the billions from events like wildfires, floods, and atmospheric rivers. These numbers are particularly concerning, given that there are an estimated $3-$4 in uninsured losses incurred by businesses for every $1 in insured loss.[13]

Figure 2 Frequency of Insured Catastrophic Losses in Canada [14]

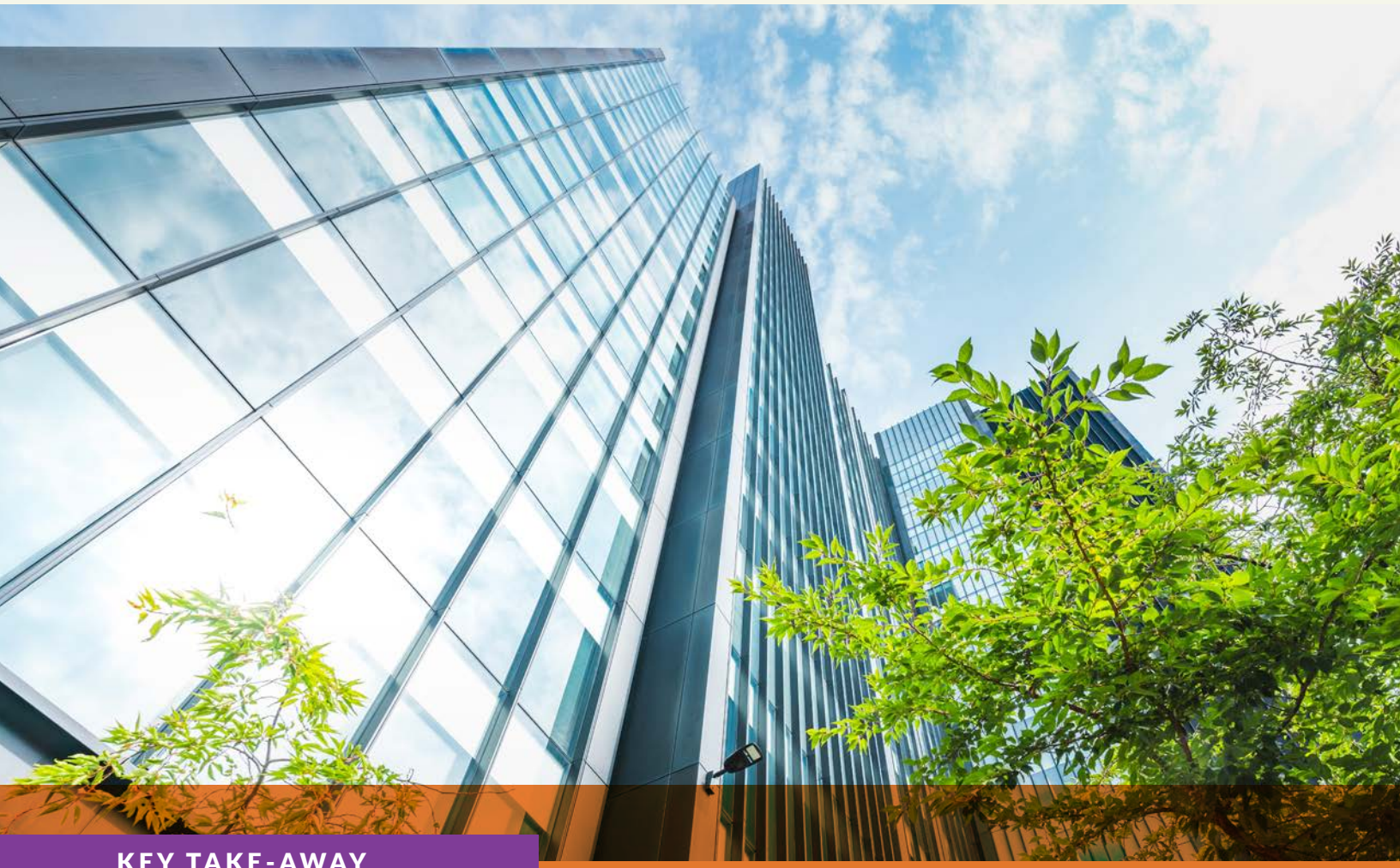


These are not random or evenly distributed risks. Independent analysis reveals that a significant portion of Canada's commercial real estate assets, including those held by publicly traded REITs, are located in areas with high exposure to physical hazards, such as flooding.[14] One study found that 17% of analyzed REIT properties were in a 200-year floodplain, compared to a national building average of 11%, with particularly high concentrations of risk in provinces like Alberta and Quebec.[15]

The insurance industry, which operates at the front line of pricing physical risk, is responding predictably. Insurers are employing sophisticated physical climate risk modeling to underwrite and price their annual policies, leading to a surge in premiums for properties in high-risk zones.[16,17] In some extreme cases, coverage is becoming prohibitively expensive or simply unavailable. Repriced annual insurance premiums can have a direct and immediate impact on a building's Net Operating Income (NOI). A sudden doubling or tripling of insurance premiums - typically treated as part of a building's operating costs - can reduce the cash flow available to owners where these costs cannot be fully or immediately passed through to tenants, thereby lowering building values.

PHYSICAL RISK

This situation creates a critical and dangerous disconnect between different professional assessments of the same asset. A lender, guided by OSFI, may underwrite a loan based on a detailed assessment of a building's climate risk. An insurer will price its policy based on granular, location-specific physical climate hazard modelling. Yet, a property valuer, adhering to current CUSPAP standards, may produce a "market value" opinion that makes no explicit mention or quantification of these very same risks. This creates a systemic vulnerability where asset values reported to investors and used for lending purposes do not reflect the full spectrum of known, priced risks. A valuation that ignores a quantifiable, multi-million-dollar future liability for retrofits or a six-figure annual increase in insurance premiums is both incomplete and misleading.



KEY TAKE-AWAY

PHYSICAL RISK IMPACTS

"Climate Resilient Assets" with lower exposure to/preventive measures in place for extreme weather (flooding, wildfires, heat stress) will be better prepared for physical risks and can expect a lower impact on OpEx, CapEx, rent and vacancy.

"Climate At-Risk Assets" with higher exposure to/no preventive measures in place for extreme weather (flooding, wildfires, heat stress) will be less prepared for physical risks and can expect a higher impact on OpEx, CapEx, rent and vacancy.

3. The Financial Performance of Sustainable Buildings

What the Academic Literature Shows

Academic research on the financial performance of sustainable buildings can be framed through the lens of two market disruptions: the emergence of (i) green building certifications and (ii) energy performance certificates (EPC) ratings. Over the past two decades (e.g., 2002-2024), these disruptions have generated a substantial body of academic literature examining whether sustainability attributes translate into superior financial outcomes.

Green Building Certifications

Across 40 peer-reviewed studies from North America, Europe, and the Asia-Pacific, the average observed value premium for green-certified buildings ranges from 3–10% after controlling for location, age, and quality.[18] These results are most prominent in office and residential asset types but also include some industrial and retail assets.

Energy Performance Certificates

Similarly, a review of 35 peer-reviewed studies of EPC ratings from Europe and Australia shows that buildings with higher EPC ratings (A to C) consistently demonstrate measurable rent, sale price and value advantages relative to those with lower scores (D to G).[18] Although the scale of these premiums differs by region and asset class, the overall trend remains uniform: better energy performance aligns with better financial outcomes.

Market Experience & Practitioner Perspectives

Market experience presents a more nuanced picture. Owners and investors frequently report that clear, standalone "green premiums" are difficult to observe in day-to-day transactions, especially in mature markets where green certifications and higher energy performance are now commonplace. In these contexts, sustainability features are often evaluated as part of overall building quality rather than as attributes that command incremental pricing.

LaSalle Investment Management's *Value of Green* analysis helps reconcile the gap between research and practice. Their meta-analysis of 100+ studies emphasizes that the distinction between a "green premium" and a "brown discount" is largely a matter of timing and market maturity.[19] When sustainability attributes are novel and scarce, observable uplifts may occur; as adoption increases, those same attributes become market expectations and pricing effects fade. Underperformance then increasingly appears on the downside – and becomes more visible and financially material - through higher risk, weaker demand, or greater capital expenditure requirements.[19]

As a result, many owners and investors view sustainability less as a source of predictable upside and more as a stabilizing factor that positively influences income, liquidity, and long term competitiveness.

Implications for Valuation & Investment Decisions

Taken together, the evidence suggests that sustainability is best understood as a risk and performance modifier rather than a guaranteed source of incremental value. While sustainable buildings may benefit from stronger tenant demand, higher occupancy, and lower operating volatility, these effects are uneven, time-dependent, and sensitive to market context. They can also be offset by capital costs, execution risk, and changing expectations.

Climate-related risks represent the next phase of market disruption. Transition and physical climate risks, decarbonization equipment costs, regulatory requirements, and insurance availability increasingly affect capital planning, operating expenses, and long-term asset viability. Although robust evidence of price premiums for low-carbon/climate-resilient assets remains limited, experience from earlier disruptions suggests that assets failing to adapt may face higher costs, constrained demand, eroding rents, or impaired liquidity over time.

For valuation purposes, climate-related risk should be increasingly considered through cash flow, capital expenditure, leasing, and exit liquidity assumptions, rather than through standardized green premiums or discounts. Professional judgment, informed by evolving market evidence and local context, will be essential.

4. Valuation Standards & Sustainability

International Valuation Standards (IVS)

The global valuation profession has formally recognized the imperative to integrate sustainability and climate-related risk into standard practice. The International Valuation Standards Council (IVSC), the global standard-setting body, has issued a comprehensive update to the International Valuation Standards (IVS), effective January 31, 2025. These updates, particularly the introduction of IVS 104 Data and Inputs and its explicit ESG (sustainability) appendix, establish a new, non-negotiable global benchmark for professional competence in valuation.[20]

The latest edition of IVS weaves the consideration of sustainability factors throughout the entire valuation process, moving it from a peripheral topic to a core component of a compliant valuation.

IVS 101 SCOPE OF WORK: The scope of work for a valuation must now explicitly identify any client requirements related to the *"consideration of significant environmental, social and governance factors"*.[20]

IVS 103 VALUATION APPROACHES: When using the Market Approach, valuers are now directed to analyze and make adjustments for *"differences in ESG considerations"* between the subject property and comparable transactions.[20]

IVS 104: DATA AND INPUTS AND APPENDIX A10: The most significant changes are in the introduction of a new standard, IVS 104, and its crucial appendix, A10: Environmental, Social and Governance (ESG) Considerations.[20] This appendix provides clear and direct guidance:

- Mandatory Consideration: *"The impact of significant ESG factors should be considered in determining the value of a company, asset or liability"* (A10.01).[20] The use of "should" in IVS denotes a presumptively mandatory requirement that is expected to be followed unless the valuer can demonstrate that alternative actions are sufficient.
- Risks and Opportunities: *"ESG factors may impact valuations both from a qualitative and quantitative perspective and may pose risks or opportunities that should be considered"* (A10.02).[20] This dual perspective is critical; it directs valuers to look not only at downside risks (like climate hazards) but also at upside opportunities (like lower operating costs or access to green financing).
- Measurability and Professional Judgment: *"ESG factors and the ESG regulatory environment should be considered in valuations to the extent that they are measurable and would be considered reasonable by the valuer applying professional judgement"* (A10.06).[20] This provides a clear framework: if a factor is measurable (e.g., quantifiable energy savings, a known insurance premium increase, a projected carbon tax) and a reasonable market participant would consider it, then the valuer is obligated to consider it as well.

IVS 106 DOCUMENTATION AND REPORTING: In a critical step toward transparency, this standard now mandates that valuation reports must convey, at a minimum, the *"significant environmental, social and governance factors used and considered"*.[20] This requires valuers to explicitly state how they have addressed these issues in their analysis.

Canadian Uniform Standards of Professional Appraisal Practice (CUSPAP)

The comprehensive update to IVS creates a stark contrast with the current state of valuation standards in Canada. The Appraisal Institute of Canada (AIC) is the national professional body responsible for setting the standards of practice for its members through the Canadian Uniform Standards of Professional Appraisal Practice (CUSPAP).

CUSPAP does not currently contain the explicit sustainability and climate-related risk integration mandates found in the new IVS; however, the AIC is expected to incorporate sustainability considerations into the next update of the CUSPAP standards and/or through its practice notes/bulletins.

For the Canadian valuation community that values commercial real estate assets, understanding and adopting this new standard is essential to maintaining alignment with global best practices and ensuring the continued credibility of their work.

5. Roadmap for Moving Forward

1 Adopt the IVS Standards for use in Canada (AIC)

The AIC has a responsibility to its members and to the public trust to ensure that Canadian valuation practices remain rigorous, relevant, and aligned with the highest international standards. Adopting the new IVS framework in Canada is a logical evolution to ensure that valuations continue to provide an accurate and defensible reflection of market value in a rapidly changing world.

RECOMMENDATION 01

AIC should adopt the new IVS framework around sustainability into the Canadian Uniform Standards of Professional Appraisal Practice (CUSPAP).

2 Establish a Climate-Related Risk Data Framework for Asset Valuations

A recurring and legitimate concern from the valuation community is the perceived lack of standardized, reliable, asset-specific data required to quantify climate-related impacts.

By adopting a standardized framework for data disclosure during the valuation process, building owners can shift the dynamic. The following framework is an example of the type of essential data package owners could prepare in the future for every valuation assignment.

Figure 3 Sample Climate Risk Data Framework for Asset Valuations

Category	Description/Purpose	Key Metrics/Evidence
1. Energy	Provides objective, third-party-verified evidence of a building's energy efficiency.	**1. Energy Use Intensity (EUI):** Total Energy Use (kWh) ÷ Floor Area (ft^2 or m^2).
2. GHG Emissions & Transition Climate Risk	Demonstrates a building's emissions footprint, % onsite GHG emissions, and response to transition climate risk.	**2. Greenhouse Gas Intensity (GHGi):** Total GHG Emissions (kg) ÷ Floor Area (ft^2 or m^2). **3. % Onsite GHG Emissions**: (Total Onsite GHG Emissions ÷ Total GHG Emissions) × 100. **4. Asset Response to Transition Climate Risk:** Documentation from the owner describing decarbonization targets and transition plans - including planned OpEx/CapEx investments.
3. Physical Climate Risk	Demonstrates how an asset addresses physical climate risks (flooding, heat, wildfire, windstorms).	**5. Asset Response to Physical Climate Risk:** Documentation from owner describing mitigation plans, OpEx/CapEx investments. **6. Insurance Policy:** Copies of property insurance policy showing premiums, deductibles, coverage, and any riders/exclusions (e.g., flood, wildfire).
4. Green Building Certifications & Financing	Provides evidence of recognized green building achievements and green financing instruments.	**7. Green Building Certifications:** Copies of certifications with level, date, and detailed scorecards (e.g., Energy Star, LEED, BOMA BEST, ZCB). **8. Green Financing:** Documentation of green/sustainability-linked bonds or loans, showing favorable terms linked to environmental performance.

A standardized data framework (and package) for every valuation, such as the one above, would empower the valuer to move beyond default market assumptions and perform a more granular, defensible analysis that reflects the property's true financial attributes.

RECOMMENDATION 02

REALPAC and AIC should lead the development of an asset-level climate-related risk data framework to support the valuation process, in collaboration with CAGBC.

3 Establish Data Systems & Benchmarks for Evaluating Climate-Related Risk Performance

Objective, credible data systems and performance benchmarks are required to help owners and appraisers consistently reflect climate-related risks in asset valuations.

Without these, owners and appraisers are constrained in their ability to make effective comparisons and potential adjustments. Fragmented or competing frameworks also present challenges.

Some data systems and benchmarks already exist – such as Energy Star (for Energy), Global Real Estate Sustainability Benchmark or "GRESB" (for Energy and GHG emissions), and Carbon Risk Real Estate Monitor or "CRREM" (for GHG emissions). Other areas are distinctly lacking, such as how an asset is responding to physical climate risk.

Owners and appraisers require clear, credible and widely adopted data systems and performance benchmarks across the market to support the incorporation of climate-related risk factors in valuations.

RECOMMENDATION 03

CAGBC should lead the identification of credible data systems and benchmarks for evaluating asset-level climate-related risk performance across markets and asset classes, in collaboration with REALPAC and AIC.

4 Ensure Climate-Related Risk is Addressed in Asset Valuations

As market practices, methodologies, and data continue to evolve, appraisers should begin incorporating climate-related risk factors into the qualitative analysis and narrative discussion within appraisal reports, with quantitative impacts reflected where supportable.

Guidance materials and training will be required to support appraisers in developing the competencies needed to assess and apply climate-related risk considerations in practice.

RECOMMENDATION 04

AIC, REALPAC and CAGBC should collaborate on the development of climate risk guidance and training materials to support the valuation process.

5 Sensitize Key Inputs within Valuation Methodologies to Incorporate Climate-Related Risk Factors

As standardized climate-related risk data is consistently provided to appraisers — supported by credible and widely accepted data systems and benchmarks — the valuation profession will be better positioned to systematically incorporate climate-related risk into asset valuations.

As the IVSC has noted, this does not require entirely new valuation methodologies, but rather the refinement and adaptation of existing approaches. The discounted cash flow (DCF) method, widely used in Canada, is particularly well suited to this purpose, as it provides a transparent framework for assessing and quantifying the financial impacts of climate-related risk.

The following table illustrates how appraisers could adapt valuation methodologies, such as the DCF, to reflect evolving market realities.

Figure 4 DCF Method - Conventional vs. Climate Risk-Informed Approach

DCF Input	Conventional Approach	Green/Resilient Assets	Transition/At Risk Assets
OPEX	Based on historical utility costs + inflation/insurance premiums + escalation	Model lower utility cost inflation/insurance premium escalation	Model higher utility cost inflation/insurance premium escalation
CAPEX	Standard, fixed structural reserve/no consideration of transition or physical risk impacts	Model lower long-term replacement/additional costs	Model higher long-term replacement/additional costs
Rent Growth	Market trends, by asset class	Model above market rent growth	Model flat or declining rent growth
Vacancy	Market average	Model lower than average and shorter downtime	Model higher than average and higher downtime
Discount Rate	Based on comparable sales and market risk	Model discount rate at lower end of market range	Model discount rate at higher end of market range
Terminal Cap Rate	"Going-in" rate + small premium for age	Stable or slightly lower terminal rate	Higher terminal rate

By systematically applying adjustments, such as those outlined above, valuers can transform valuation methodologies, such as the standard DCF, from a static, historically focused tool into a more dynamic model that accurately captures the tangible risks and opportunities posed by climate change.

RECOMMENDATION 05

AIC and REALPAC should collaborate on a review of valuation methodologies, such as the DCF model, to sensitize key inputs and consider a new climate-related risk-informed approach.

Implementation Considerations

A focused and thoughtful implementation approach is required to successfully execute the recommendations above. The following should be considered as part of the implementation approach.

PILOT PROJECTS FOR PARTICULAR REGIONS & ASSET CLASSES

Pilot a new climate-related risk-informed approach for areas with strong regulatory drivers, data systems and benchmarks. Vancouver Office/Retail may be a suitable candidate due to Vancouver's advanced Building Performance Standard (BPS) that includes GHG emission limits.

"SHADOW" VALUATIONS

Provide owners with a "shadow" valuation that considers climate-related risk scenario analysis alongside traditional valuations. This could start as a pilot for a period designated by the AIC, be provided at the owner's request, or incorporated into future versions of CUSPAP.

ALIGNMENT WITH CANADA'S SUSTAINABLE FINANCE TAXONOMY

The Government of Canada's Budget 2025 reconfirmed the government's support for made-in-Canada sustainable investment guidelines (also known as a taxonomy) for priority sectors by the end of 2026. These investment guidelines will provide credible definitions for "green" and "transition" investments, including commercial real estate.

The Sustainable Finance Taxonomy definitions should be considered/incorporated across all recommendations above.

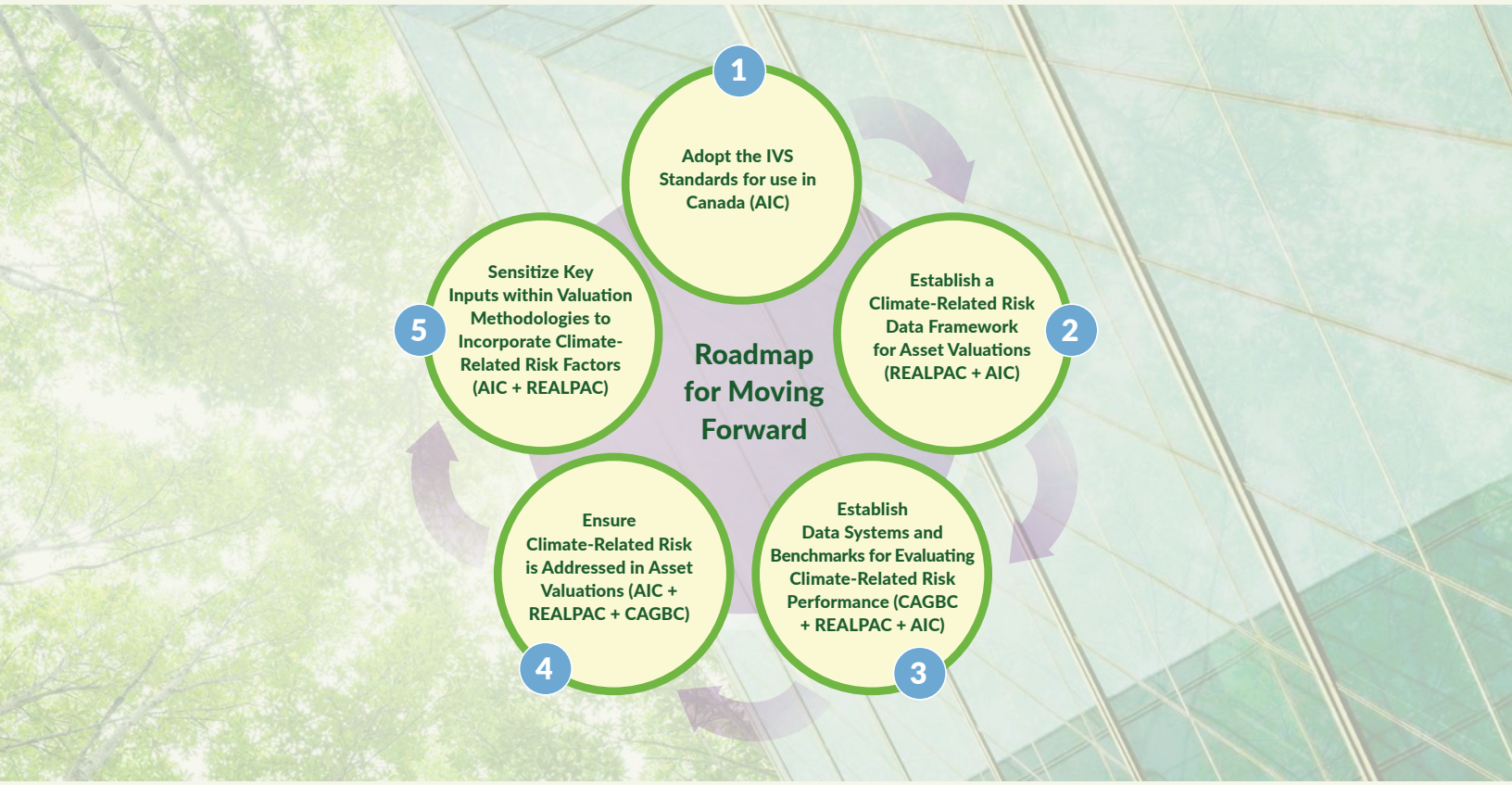
Conclusion

This report concludes that Canada's commercial real estate valuation practices must evolve to fully integrate climate-related risks.

As awareness, data and benchmarks around climate-related risks continue to develop, their impact within asset valuations is likely to be reflected through cash flow durability, capital expenditures, leasing risk, and liquidity rather than standardized valuation premiums.

International standards, notably IVS 104, now require valuers to consider sustainability factors, offering a clear framework for doing so.

This report provides a roadmap for ensuring valuations remain accurate, relevant, and reflective of key shifts around climate-related risks impacting the Canadian commercial real estate industry (suggested lead organizations in brackets):



For the Canadian valuation profession, this is a moment of truth: continuing with the status quo means knowingly ignoring quantifiable climate-related risks and measurable performance differences, leading to valuations increasingly disconnected from the decisions of investors, lenders, insurers, and tenants.

Integrating climate-related risk going forward is not optional - it is essential to ensure valuations remain accurate, credible, and aligned with global market and climate realities.

END NOTES

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Appendix 1 - Summary of Research Studies

Over 100 academic peer-reviewed research papers were published between 2002 and 2024, covering North America, Europe, and the Asia-Pacific. The research papers examined whether energy performance and green building certifications provided financial benefits in terms of rent, sales price, and valuation. While over 100 studies were analyzed as part of this report, a selection of high-quality studies is summarized below as a representative sample. The criteria used to select these studies included the following: (i) published in a reputable journal, (ii) credible methodologies that normalized for a range of intervening variables, (iii) large datasets, (iv) geographic distribution, and (v) coverage across asset classes and timeframes.

Table 1 **Summary of Green Certification Studies**

Study Details	Dataset and Location	Study Objective	Methodology	Key Findings
SINGLE-FAMILY RESIDENTIAL				
Figure Reference: USA (2007 – 2009) Authors: Benefield, J. D., Hefner, F., & Hollans, H. Publication Year: 2019 Title: Green certifications in residential real estate: Discounted cost savings or name recognition?	• 345 green-certified residential properties • A medium-sized coastal city in the southeastern United States • Data from the Multiple Listing Service (MLS)	• Compare property value differences among U.S. homes with different green certifications, focusing on ENERGY STAR versus EarthCraft programs.	• Hedonic pricing regression controlling for property, time, location, and green certification variables to isolate certification impacts on sale price.	• ENERGY STAR homes sold for 6.2% more than other green-certified homes. • EarthCraft certification was not significant, suggesting buyers value recognizable certification brands.
Figure Reference: Netherlands (2008 – 2009) Authors: Brounen, D., & Kok, N. Publication Year: 2011 Title: On the economics of energy labels in the housing market	• 100,000+ residential homes • The Netherlands • Transactions that took place between 2008-2009 • Datasets from Dutch Association of Realtors (NVM), Agentschap NL, Dutch Central Bureau of Statistics	• Analyze (1) the adoption dynamics of the EU's new 2008 Energy Performance Certificates (EPCs) in the Dutch housing market and (2) whether these labels affect residential sale prices.	• Logistic regression and two-stage Heckman selection model to assess the pricing effects of green labelled vs. non-green labelled homes, incorporating dwelling, neighbourhood, political, and regional characteristics across Dutch provinces.	• Homes with an EPC label sell for a premium of 3.6% relative to comparable dwellings with no green label. • Adoption of energy labels is low and declining over time, concentrated in smaller homes with more difficult selling conditions.

Study Details	Dataset and Location	Study Objective	Methodology	Key Findings
MULTI-UNIT RESIDENTIAL				
Figure Reference: USA (2012) Authors: Bond, S. A., & Devine, A. Publication Year: 2016 Title: Certification matters: Is green talk cheap talk?	• 97 LEED multifamily rental properties (26,744 units) and 193 comparable non-LEED properties (57,115 units) • Major U.S. urban markets • Data from LEED certification database; property websites; Walk Score; leasing agents	• Determine whether LEED certification affects rental values of U.S. market-rate multifamily apartments compared to green and non-green properties.	• Hedonic semi-log regression using unit-level rental data and Coarsened Exact Matching to compare LEED, green non-certified, and non-green apartments.	• LEED-certified apartments earn approximately 8.9% higher rents than non-certified units and 4% higher than green non-certified ones, confirming a strong certification-driven premium.
Figure Reference: USA (2016 – 2017) Authors: Gabe, J., McGrath, K., Robinson, S., & Sandford, A. Publication Year: 2023 Title: An analysis of U.S. multi-family housing, eco-certifications, & walkability	• 82,094 market-rate multifamily properties (736 LEED-certified, ≥50 units) • 36 U.S. urban areas, including Chicago, Portland, Seattle, Washington D.C. • Rental rates covering 2016-2017 Data from CoStar Group's Apartments.com database	• Determine whether LEED certification continues to produce rental premiums in U.S. multifamily housing amid increasing market adoption.	• Semi-log hedonic regression analyzing annual average rents per square foot, controlling for property traits, location, and Walk Score.	• LEED-certified properties show rental premiums of 10.2% nationwide and 14.7% in high-certification areas. • When adjusting for urban form using Walk Score, rental premiums reduce to 7.4% nationwide and 9.6% in high-certification areas. • Results align with earlier research, indicating consistent pricing advantages for certified buildings. • Findings suggest that rental premiums persist over time and grow with broader LEED adoption.
Figure Reference: Singapore (2000 – 2010) Authors: Deng, Y., Li, Z., & Quigley, J. Publication Year: 2011 Title: Economic Returns to Energy-Efficient Investments in the Housing Market: Evidence from Singapore	• 1,439 private multifamily residential buildings with 74,278 dwelling units (62 Green Mark-certified buildings with 18,296 dwelling units) • Singapore • Transactions between 2000-2010 • Data from Singapore housing transaction records and Green Mark certification database	• Evaluate how Singapore's Green Mark certification affects residential property values and provides evidence of financial returns to green buildings.	• Two-stage analysis: hedonic pricing model on housing transactions, followed by regression of project fixed effects on Green Mark certification and locational factors.	• Residential units certified under the government's Green Mark program sold at an average 4% price premium, demonstrating strong financial returns and market recognition for sustainable buildings in Singapore.

Study Details	Dataset and Location	Study Objective	Methodology	Key Findings
MULTI-UNIT RESIDENTIAL				
Figure Reference: Singapore (2000 – 2016) Authors: Fesselmeyer, E. Publication Year: 2018 Title: The value of green certification in the Singapore housing market	• 119,826 new private apartments in 889 residential developments • Singapore • Transactions that took place between 2000-2016 • Data from Real Estate Information System (REALIS), Singapore Land Authority	• Estimate the effect of Singapore's Green Mark certification on housing prices by comparing sales before and after certification within developments.	• Hedonic price regression with development fixed effects comparing pre- and post-certification transactions; key variable is Green Mark certification status.	• Green certification increases apartment sale prices by about 3%. • The largest premium of 4.1% in marginally green developments, indicating certification reduces buyer uncertainty.

Study Details	Dataset and Location	Study Objective	Methodology	Key Findings
OFFICE				
Figure Reference: USA (2004 – 2007) Authors: Eichholtz, P., Kok, N., & Quigley, J. M. Publication Year: 2010 Title: Doing well by doing good? Green office buildings	• 1,360 certified buildings (286 LEED, 1,045 ENERGY STAR, 29 both) and ~8,105 control office buildings (~10,000 total) • 853 submarkets across the U.S. • Sales data from 2004–2007; certifications identified as of September 2007 • CoStar commercial real estate database matched with USGBC and EPA ENERGY STAR datasets	• Measure how green certification (LEED, ENERGY STAR) affects rents, effective rents, and sale prices of U.S. commercial office buildings.	• Hedonic regression comparing rents and sale prices of certified versus nearby non-certified office buildings within 0.25-mile clusters, controlling for characteristics.	• Green buildings command:16% higher sale prices, 3% higher rents, 7% higher effective rents. • Value premiums increase with energy savings and in lower-cost regions.
Figure Reference: USA (2004 – 2013) Authors: Holtermans, R., & Kok, N. Publication Year: 2019 Title: On the value of environmental certification in the commercial real estate market	• 26,212 commercial office buildings • 7 largest U.S. metropolitan areas • Transactions that took place between 2004-2013 • CoStar database and U.S. Green Building Council (USGBC) data	• Analyze how environmental certification affects rents, occupancy, and pricing of U.S. commercial office buildings over time.	• Longitudinal rent and performance analysis using hedonic and propensity-weighted models; key variables include certification type, rating, rent, occupancy, and climate factors.	• Buildings with LEED certification transact on average 14.8% higher compared to non-certified buildings. • LEED buildings command a rent premium of 2.2%, with effective rental premiums of 4.6%.

Study Details	Dataset and Location	Study Objective	Methodology	Key Findings
OFFICE				
Figure Reference: London, UK (2000 – 2009) Authors: Chegut, A., Eichholtz, P. M. A., & Kok, N. Publication Year: 2013 Title: Supply, demand and the value of green buildings	• 2,103 commercial sale transactions in London: 68 BREEAM-certified, the rest uncertified • Data from BRE's database on BREEAM certified buildings; matched address files to sales transactions between 2000-2009	• Investigate the role of green building supply on market dynamics by assessing the impact of growing competition of environmentally certified real estate on the prices of 'certified' and 'non-certified' office buildings.	• Ex post transaction-based hedonic model comparing BREEAM-rated office buildings and a control sample of conventional office buildings.	• 14.7% premium for sales transactions for certified buildings compared to non-certified buildings in the same locational cluster. • 19.7% premium for rental transactions. • The marginal effect of certified vs. non-certified buildings in a neighbourhood decreases as the number of certified buildings increase, meaning late entrants do not realize the same rental and price premiums as early adopters.
Figure Reference: Global (2008 – 2019) Authors: Leskinen, N., Vimpari, J., & Junnila, S. Publication Year: 2020 Title: A review of the impact of green building certification on the cash flows and values of commercial properties	• Over 70 peer-reviewed studies on income-generating commercial investment properties • Primarily U.S.; some European • Studies published between 2008-2019 • Data from peer-reviewed academic studies retrieved via Google Scholar and Scopus; industry reports excluded	• Review empirical research on how green building certificates affect property cash flows and values for professional real estate investors.	• Systematic literature review categorizing 70+ peer-reviewed studies using discounted cash flow framework analyzing rents, operating costs, occupancy, yields, and values.	Certified buildings show higher: • Sales prices (14.1%) • Rents (median average 4.6%) • Occupancy (4.3%) • Lower yields and inconclusive operating cost results.
Figure Reference: USA (2001 – 2011) Authors: Robinson, S., & McAllister, P. Publication Year: 2015 Title: Heterogeneous price premiums in sustainable real estate? An investigation of the relation between value and price premiums	• 25,422 office sales • 50 U.S. metropolitan statistical areas (MSAs), 56 defined markets • Transactions that took place between 2001-2011 • CoStar commercial real estate database	• Determine whether LEED and ENERGY STAR certification price premiums vary across building value segments in U.S. office markets.	• Hedonic and quantile regressions, value-weighted by sales and rent revenue, comparing LEED, ENERGY STAR, and dual-certified offices by value tier.	• LEED certified offices sold at a price premium of 13%. • Certified offices show premiums mainly in smaller, lower-value buildings. • High-value offices display minimal premiums, suggesting market saturation in top segments.

Study Details	Dataset and Location	Study Objective	Methodology	Key Findings
OFFICE				
Figure Reference: Hong Kong (2016) Authors: Wadu Mesthrige, J., & Chan, H. Publication Year: 2019 Title: Environmental Certification Schemes and Property Values: Evidence from the Hong Kong Prime Commercial Office Market	• 67 grade A office buildings; 46 certified by HKBEAM, BEAM-Plus and LEED • Hong Kong • Projects certified as of March 2016 • Datasets from Hong Kong Green Building Council, BEAM Society, US Green Building Council, Economics Property Research Centre	• Investigate whether the green-certification schemes help buyers to recognize the benefits of green office buildings by their willingness to pay a premium for such buildings	• Hedonic price model through a fixed effects approach, modelling the effects of physical, locational, and neighbourhood attributes plus the effect of environmental certification.	• Green certified offices achieve an average rental premium of 10.9%. • Findings indicate that the higher rental income from green office buildings can cover the additional costs of obtaining green certification within a period of 22 months.
Figure Reference: EU (2007 – 2018) Authors: Ghosh, C., & Petrova, M. T. Publication Year: 2023 Title: Building sustainability, certification, and price premiums: Evidence from Europe	• 16,559 office building transactions (≥€5 million), including 7% certified and 93% non-certified • France, Germany, Italy, Netherlands, Spain, United Kingdom • Transactions that took place between 2007-2018 • Data from the Real Capital Analytics transaction database	• Assess how green certification affects office building cashflows and transaction prices across six Western European countries.	• Hedonic regression model with multivariate-distance matching of certified and non-certified buildings, controlling for age, location, transaction year, and market conditions.	• Certified offices achieve ~12% higher operating income and ~10% higher sale prices. • Premiums persist across markets, higher for Gold/Platinum ratings, stable over time.
Figure Reference: Tokyo (2009-2019) Authors: Onishi, J., Deng, Y., & Shimizu, C. Publication Year: 2021 Title: Green Premium in the Tokyo Office Rent Market	• 37,346 new lease contracts for office buildings in Tokyo's 23 wards; 1,981 green certified buildings • Between 2009-2019 • Dataset from Xymax Corporation rent database, CASBEE, CASBEE for Real Estate, and DBJ Green Building Certification	• Measures the green rent premium in Tokyo's office market, and examines how this premium varies across building types and market segments.	• Hedonic regression model, repeat sales model, propensity score matching, and propensity score clustering.	• On average, office properties with a green label gain a premium of 6.5% on contract rents. • The green premium is larger in older, smaller buildings, suggesting certification acts as a differentiating factor where other quality features are lacking.

Study Details	Dataset and Location	Study Objective	Methodology	Key Findings
OFFICE				
Figure Reference: Australia (2011) Authors: Newell, G., MacFarlane, J., and Kok, N. Publication Year: 2011 Title: Building Better Returns: A Study of the Financial Performance of Green Office Buildings in Australia	• 366 office buildings: 206 NABERS-rated, 160 non-NABERS-rated, 23 buildings Green Star • Data as of March 2011 • Sydney and Canberra • Datasets from NABERS Energy ratings and Green Star rating, and JLL and CBRE databases	• Assess whether green-rated office buildings in Australia (NABERS Energy and Green Star rated) achieve financial performance premiums (higher rents, values, and lower vacancies) compared to non-rated office buildings.	• Hedonic regression model to isolate the impact of green certification while controlling for other building attribute, controlling for size, building quality, and submarket location	• A 5% green premium in rents for Green Star rated office buildings. • Office buildings with a 5-Star NABERS energy rating deliver a 9% green premium in value. • Green premiums were also evident in reduced vacancy, reduced outgoings, reduced incentives and reduced yields, particularly at the higher rated NABERS energy categories.
Figure Reference: USA (1999 – 2008) Authors: Fuerst, F., & McAllister, P. Publication Year: 2010 Title: Green noise or green value? Measuring the effects of environmental certification on office values	• 127 LEED, 559 ENERGY STAR, and 15,000+ benchmark non-certified office buildings (plus 559 ENERGY STAR and 127 LEED sales) • 81 U.S. metropolitan areas • Transactions that took place between 1999-2008 • Rent observations as of Q4 2008 • CoStar national commercial real estate database (in collaboration with USGBC and EPA)	• Quantify the rental and sale price effects of LEED and ENERGY STAR certification in U.S. commercial real estate markets.	• Hedonic regression comparing rents and prices of LEED/ ENERGY STAR-certified versus non-certified office buildings controlling for physical and locational attributes.	• Certified buildings earn average 4.5% higher rents and average 25.5% higher sale prices, with stronger premiums for higher certification levels, indicating investor preference for eco-certification.

Study Details	Dataset and Location	Study Objective	Methodology	Key Findings
OFFICE				
Figure Reference: USA, Canada (2004 – 2013) Authors: Devine, A., & Kok, N. Publication Year: 2015 Title: Green certification and building performance: Implications for tangibles and intangibles	• 291 office buildings • Canada and U.S. • Transactions that took place between 2004-2013 • Proprietary dataset from Bentall Kennedy (now known as BentallGreenOak)	• Assess how LEED and BOMA BEST affect building performance: financial (rent, occupancy, and tenant concessions) and non-financial (tenant satisfaction and utility use).	• Hedonic pricing model estimated via ordinary least squares to isolate the impact of green certification on rent and occupancy outcomes.	• Certified buildings offering rent concessions show a smaller rental rate discount (7%) compared to non-certified ones (11%), suggesting that certification reduces the impact of concessions on rent by 4%. Certified buildings compared to non-certified buildings also achieved: • 9.4% higher net effective rent • 10-20% higher tenant satisfaction • 8.5-18.7% higher occupancy rates • 3.4-5.6% higher lease renewal rates

Study Details	Dataset and Location	Study Objective	Methodology	Key Findings
INDUSTRIAL				
Figure Reference: Netherlands & UK (2019 – 2023)* Authors: Crighton, T., Woodhead, J., & Bruer, S. Publication Year: 2024 Title: Sustainable Logistics: Navigating Change in European Logistics Real Estate	• Logistics and industrial assets of over 10,000 square meters • 1,500 transactions between 2019-2023 (18% with a BREEAM rating of Very Good or higher) • The Netherlands and UK	• Understand how investors are putting a premium on sustainability-rated assets.	• Analyze the pricing differential for higher sustainability-rated assets that investors have paid over the past 5 years (broadly the period that a difference in pricing has emerged in real estate investment), comparing assets with BREEAM ratings of Very Good or better and assets with low/ no rating.	• 12% pricing premium in 2021 as market activity in logistics and industrial investment reached unprecedented levels. • Pricing premium has evolved over time as market conditions change, ranging from 7-31% from 2019-2023.

Study Details	Dataset and Location	Study Objective	Methodology	Key Findings
INDUSTRIAL				
Figure Reference: USA (2007-2009) Authors: Harrison, D.M., & Seiler, M.J. Publication Year: 2011 Title: The Political Economy of Green Industrial Warehouses	• 20,172 industrial properties across the U.S. • Datasets from CoStar, U.S. Census Bureau, National Climatic Data Center, Bureau of Labour Statistics, Federal Elections Commission • Likely between 2007-2009	• Examine the relationship between LEED or ENERGY STAR certification and valuation in a previously unexplored property type: industrial warehouse facilities.	• Two sets of Ordinary Least Squares (OLS) regressions: determinants of rent per square foot and determinants of occupancy rates; controlling for geographic and regional effects plus regulatory environment	• Green warehouses in politically liberal areas rent at an 8% premium

NOTE: "The Netherlands & UK (2019-2023)" is not an academic peer-reviewed study, but has been included as it provides recent insights into the premiums associated with green certifications in the industrial asset class sector.

Table 2 **Summary of Energy Performance (EPC Ratings) Studies**

Study Details	Dataset and Location	Study Objective	Methodology	Key Findings
OFFICE				
Figure Reference: Australia (2011) Authors: Newell, G., MacFarlane, J., and Kok, N. Publication Year: 2011 Title: Building Better Returns: A Study of the Financial Performance of Green Office Buildings in Australia	• 366 office buildings: 206 NABERS-rated, 160 non-NABERS-rated, 23 buildings Green Star • Data as of March 2011 • Sydney and Canberra • Datasets from NABERS Energy ratings and Green Star rating, and JLL and CBRE databases	• Assess whether green-rated office buildings in Australia (NABERS Energy and Green Star rated) achieve financial performance premiums (higher rents, values, and lower vacancies) compared to non-rated office buildings.	• Hedonic regression model to isolate the impact of green certification while controlling for other building attribute, controlling for size, building quality, and submarket location	• Office buildings with a 5-Star NABERS energy rating deliver a 9% green premium in value. • Green premiums were also evident in reduced vacancy, reduced outgoings, reduced incentives and reduced yields, particularly at the higher rated NABERS energy categories. • A 5% green premium in rents for Green Star rated office buildings.

Study Details	Dataset and Location	Study Objective	Methodology	Key Findings
OFFICE				
Figure Reference: England & Wales (2018) Authors: Akhtyrska, Y., & Fuerst, F. Publication Year: 2024 Title: The effectiveness of climate change regulations in the commercial real estate market	• 33 London local authorities • Leases signed between 2008-2020 • Datasets from Radius Data Exchange, UK non-domestic EPC register, and CoStar	• Assess the market impacts of Minimum Energy Efficiency Standards (MEES) on office rental values in London.	• Machine learning methods, Difference in Differences (DiD) and Fixed Effects (FE) panel data estimation.	• MEES reduced rents of affected London office units by 6-8% (average 7%), with a smaller 4.4% discount for nearby EPC E-rated buildings.
Figure Reference: Netherlands (2005 – 2010) Authors: Kok, N., & Jennen, M. Publication Year: 2012 Title: The impact of energy labels and accessibility on office rents	• 1100 leasing transactions between 2005-2010 • The Netherlands • Datasets from CBRE, JLL and DTZ Zadelholf	• Evaluate the financial implications (in terms of rent) of energy efficiency in the European commercial real estate market.	• Hedonic regression to analyze the effect of energy efficiency, approximated by EPCs, controlling for age, size of building, density, and location.	• Buildings with EPC levels D-G command rental levels 6.5% lower than buildings with EPC levels A-C.

Study Details	Dataset and Location	Study Objective	Methodology	Key Findings
RETAIL				
Figure Reference: Netherlands (2015 – 2021) Authors: Zhang, J. J., Ward, H., & Qian, Q. Publication Year: 2024 Title: The spatial dynamics of energy efficiency: EPC impact on retail property values	• 1015 lease and 478 sale transactions • Between 2015-2021 • The Netherlands • Datasets from The Dutch Cooperative Association of Estate Agents and Appraisers, the Netherlands Enterprise Agency, and Locatus	• Analyze the effect of energy efficiency on transacted rental and capital value of retail assets.	• Multi-variant ordinary least squares regression using a log-linear model, controlling for geographic region, retail positioning, physical characteristics, and transaction type.	• Premium of 11% for rental transactions with C-label or higher on a price per square meter basis. • Capital premiums for energy efficient transactions are more marginal and complex.

Study Details	Dataset and Location	Study Objective	Methodology	Key Findings
MULTI-UNIT RESIDENTIAL				
Figure Reference: Northern Ireland (2022) Authors: McCord, M., McCord, J., Davis, P., Haran, M., & Squires, G. Publication Year: 2024 Title: Do private rental tenants pay for energy efficiency?: The dynamics of green premiums and brown discounts	• 2,914 rental transactions • Northern Ireland • Dataset from Ulster University Rental Price Index (UURPI) • Covering the period of Q2 2022 to Q4 2022	• Examine the relationship between EPCs and rental prices in the private rental sector to alleviate the split-incentive problem between landlords and tenants within the U.K.	• Hedonic and quantile regressions, controlling for variables such as size, year, number of bedrooms, furnishings, grade, and location.	• Rental premiums for B- and C-rated dwellings of 8.2% and 2.4%, respectively. • Discount effects for E, F, and G-rated properties between 3.9-5.5%.
Figure Reference: Barcelona (2015) Authors: Marmolejo-Duarte, C., & Chen, A. Publication Year: 2019 Title: The uneven price impact of energy efficiency ratings on housing segments and implications for public policy and private markets	• Transactions for 3,479 multi-family units from Q1 2015 • 178 municipalities of the Metropolitan Transport Authority of Barcelona • Listing data from Habitaclia (real estate listing website)	• Examine if the impact of EPCs on housing prices is homogenous across residential market segments within Barcelona.	• Standard hedonic pricing model and multivariant segmentation to split the sample into housing segments, controlling for size, unit type, building level amenities, location, and local economic conditions.	• Market premium of 7.8% for the sale of A-rated units compared to G-rated units. • For modern apartments, the energy rating did not significantly impact the difference in pricing. • For cheaper apartments or those in low-income areas, the “brown discount” was observed for lower energy rated units.
Figure Reference: Italy (2018) Authors: Bisello, A., Antoniucci, V., & Marella, G. Publication Year: 2020 Title: Measuring the price premium of energy efficiency: A two-step analysis in the Italian housing market	• 825 housing unit listing prices • Bolzano, Italy • Dataset from online provider of housing market prices available in 2018	• Analyze how local real estate markets react to mandatory energy performance certificates.	• Hedonic pricing model using ordinary least squares method to isolate the relationship between energy efficiency labels and housing unit price, controlling for state of repair and location.	• Listing price premium of 6.5%, 5.5%, and 3% for A-, B-, and C-labelled housing units, respectively, compared against G-labelled houses.

Study Details	Dataset and Location	Study Objective	Methodology	Key Findings
MULTI-UNIT RESIDENTIAL				
Figure Reference: Netherlands & UK (2010 – 2015) Authors: Chegut, A., Eichholtz, P., Holtermans, R., & Palacios, J. Publication Year: 2020 Title: Energy efficiency information and valuation practices in rental housing	• 12,000 dwellings in England and 53,000 dwellings in The Netherlands (mix of apartments and single-family homes) • 2010 (The Netherlands), 2012 (England) and 2015 (both) • Datasets from one English and one Dutch affordable housing provider	• Analyze the relationship between energy efficiency labels and the assessed market values of affordable housing.	• Standard hedonic pricing model, controlling for building quality, location, and general housing market conditions.	• 6.5% and 3.1% value premiums for A- and B-labelled dwellings compared to C-labelled dwellings (2015 datasets). • 3.7% valuation discount for D to F-labelled dwellings compared to C-labelled (2015 dataset). • Premiums were not observed in the 2010 or 2012 datasets, suggesting that valuation practices have changed over time. • Did not find evidence for an energy efficiency rental premium.

Study Details	Dataset and Location	Study Objective	Methodology	Key Findings
SINGLE-FAMILY RESIDENTIAL				
Figure Reference: Wales (2003 – 2014) Authors: Fuerst, F., McAllister, P., Nanda, A., & Wyatt, P. Publication Year: 2016 Title: Energy performance ratings and house prices in Wales: an empirical study	• 191,554 dwelling transactions and 47,158 repeat sales in the original dataset • Wales • Transactions between 2003-2014	• Investigates the price effect of EPC ratings on residential dwelling prices in Wales.	• Hedonic price modelling to estimate the impact of EPC ratings on house prices using label-D as the comparison, controlling for size and age.	• 11.3% sales premium for A/B-rated dwellings compared to D-rated dwellings. • Discounts for EPC-ratings lower than D: -2.1% for E-rated, -4.7% for F-rated, and -7.2% for G-rated.

Study Details	Dataset and Location	Study Objective	Methodology	Key Findings
SINGLE-FAMILY RESIDENTIAL				
Figure Reference: Netherlands & UK (2010 – 2015) Authors: Chegut, A., Eichholtz, P., Holtermans, R., & Palacios, J. Publication Year: 2020 Title: Energy efficiency information and valuation practices in rental housing	• 12,000 dwellings in England and 53,000 dwellings in The Netherlands (mix of apartments and single-family homes) • 2010 (The Netherlands), 2012 (England) and 2015 (both) • Datasets from one English and one Dutch affordable housing provider	• Analyze the relationship between energy efficiency labels and the assessed market values of affordable housing.	• Standard hedonic pricing model, controlling for building quality, location, and general housing market conditions.	• 6.5% and 3.1% value premiums for A- and B-rated dwellings compared to C-rated dwellings (2015 datasets). • 3.7% valuation discount for D to F-rated dwellings compared to C-rated (2015 dataset). • Premiums were not observed in the 2010 or 2012 datasets, suggesting that valuation practices have changed over time. • Did not find evidence for an energy efficiency rental premium.
Figure Reference: Europe (2011 – 2024) Authors: Ou, Y., Bailey, N., McArthur, D.P., Zhao, Q. Publication Year: 2025 Title: The price premium of residential energy performance certificates: A scoping review of the European literature	• 68 studies and 111 models • Representing over 32 million housing transactions (single-family and apartment units) • Covering 29 countries in Europe • Data sources from peer reviewed journals, working papers, and institutional reports published between 2011-2024	• Quantify the relationship between residential EPC ratings and sale price differentials, using a meta-analysis of existing empirical studies.	• Collected effect sizes (price premiums) across studies. • Calculated median price premium per EER band relative to Band D. • Examined the approximate incremental effect per one-band improvement.	• Highest-rated homes (A-rated) command the highest sale premium of 6.3% compared to D-rated homes. • The median price premium of EPC bands relative to D are: A (6.3%), B (4.6%), C (1.4%), E (-1.0%), F (-2.6%) and G (-3.4%). • The relationship is approximately linear, with 1-3% price change per EPC band.
Figure Reference: Denmark (2007 – 2012) Authors: Jensen, O.M., Hansen, A.R., & Kragh, J. Publication Year: 2016 Title: Market response to the public display of energy performance rating at property sales	• 117,483 single-family detached home sales with EPCs and energy performance ratings • Denmark • Transactions between 2007-2012 • Dataset from the Danish Building Stock Register and the database of the Energy Performance Certification Scheme	• Examine the impact of the Danish adoption of the 2010 EU Directive concerning mandatory commercial advertising of energy performance on sales prices.	• Descriptive statistic examining property sales and energy performance ratings, as well as regression modelling to isolate the effect of energy performance ratings on sales price (controlling for time of sale and location).	• Properties with an EPC rating A or B sold 6.2% higher compared to properties with an EPC rating of D post 2010 EU Directive. • C-rated properties saw a 5.1% increase; E-, F- and G-rated properties saw a sales decrease of 5.4%, 12.9% and 24.3%.

Study Details	Dataset and Location	Study Objective	Methodology	Key Findings
SINGLE-FAMILY RESIDENTIAL				
Figure Reference: England (1995 – 2012) Authors: Fuerst, F., McAllister, P., Nanda, A., & Wyatt, P. Publication Year: 2015 Title: Does energy efficiency matter to home-buyers? An investigation of EPC ratings and transaction prices in England	• 333,095 dwellings • Transactions between 1995-2012 • England and Wales • Dataset from Calnea Analytics, comprising residential transaction prices as submitted to the UK Land Registry; socio-economic data from the Office for National Statistics; EPC data from Landmark	• Investigates the relationship between energy performance ratings and sale prices of dwellings in England.	• Hedonic regression model to estimate the effect of EPC ratings on house prices, controlling for location, dwelling quality, property type, age, number of bedrooms.	• Sale premium of 5% for dwellings rated A/B and 1.8% for dwelling rated C compared to D-rated dwellings. • Discounts for dwellings rated E (-0.7%) and F (-0.9%).
Figure Reference: Global (Yr. pub. 2019) Authors: Cespedes-Lopez, M., Mora-Garcia, R., Perez-Sanchez, V., & Perez-Sanchez, J. Publication Year: 2019 Title: Meta-Analysis of Price Premiums in Housing with Energy Performance Certificates (EPC)	• Data from 66 studies with 173 housing sales registers covering Europe (31 studies) North America (20), Asia (13), and Oceania (2) • Certificates examined in studies include EPC (A-G), ENERGY STAR, LEED, CASBEE, Green Star, NABERS, Minergie, Green Mark • Studies span multiple periods globally	• Determine whether housing with energy performance certificates (EPCs) achieve positive sales price premiums through a global meta-analysis of prior studies.	• Systematic review, meta-analysis, and meta-regression assessing EPC impact on housing sales price premiums by region and energy performance certificate type.	• Global average sales premium of 4.2% for properties with an EPC. • North America showed the highest average premium at 5.36%; Asia was found to have a 4.81% average premium. • Although a 2.32% premium was found in Europe, the results were inconclusive because the studies reviewed did not achieve consensus on the base letter (A-G) to be used for comparison.

REALPAC
77 King St West,
TD North Tower
Suite 4030 PO Box 147
Toronto ON M5K 1H1
Canada

realpac.ca

CAGBC
100 Murray Street,
Suite 400
Ottawa ON K1N 0A1
Canada

cagbc.org

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