This document has been prepared as part of the implementation project of Legal Pathways to Deep Decarbonization (Michael B. Gerrard and John C. Dernbach, eds. Environmental Law Institute [2019]) (LPDD). For background information on the project, see https://lpdd.org

**Memorandum to Accompany Model State Legislation:**
**Green Commercial Lease Provisions**[1]

## I. Introduction

This recommendation is drafted for the *Legal Pathways to Deep Decarbonization Project* ("LPDD") at Columbia Law School's Sabin Center for Climate Change[2] to assist state legislatures in developing green commercial lease provisions. The purpose of the proposed legislation is to assist landlords, tenants and other parties-in-interest in drafting lease provisions that comply with state green building code requirements, compliance with Third Party Rating Systems (as defined in the accompanying legislation), and support energy and water efficiency and sustainability in the commercial building sector, including office buildings, shopping centers, retail, and other large commercial properties. The provisions are recommended as voluntary to assist with compliance, energy, water, and sustainability objectives, not to regulate commercial leases among states. It addresses goals set forth in chapters 10 and 11 of *Legal Pathways to Deep Decarbonization in the United States* concerning the significant reduction of energy use by new and existing buildings, and state building code compliance standards aimed at the reduction of greenhouse gas (GHG) emissions and embodied carbon.[3]

In the United States, the building sector is a leading consumer of the nation's energy use, responsible for over one-third of total energy used (roughly 38-40%), including 75% of all electricity and 35% of the nation's carbon emissions.[4] "Globally, in developed and developing countries, buildings contribute[] to 33% of the greenhouse gas (GHG) emissions and 40% of the

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[1] This memorandum was prepared by Jessica M. Simon, Ballard Spahr, LLP (2024), serving as a pro bono volunteer for LPDD.

[2] LPDD, *Model Laws for Deep Carbonization in the United States*, at https://lpdd.org/model-laws/ (last visited December 4, 2023); Sabin Center for Climate Change Law, Columbia Law School, Columbia Climate School, at http:// https://climate.law.columbia.edu/ (last visited December 4, 2023).

[3] Legal Pathways to Deep Decarbonization in the United States (Michael B. Gerrard and John C. Dernbach, eds. Environmental Law Institute [2019]), at https://www.eli.org/eli-press-books/legal-pathways-deep-decarbonization-united-states (last visited December 4, 2023).

[4] National Renewable Energy Laboratory ("NREL"), *Researchers Reveal How Buildings Across United States Do—and Could—Use Energy, New Data Set Reveals How Improvements to U.S. Buildings Could Reduce Carbon Emissions and Increase Occupant Comfort* (September 14, 2023), at https://www.nrel.gov/news/features/2023/nrel-researchers-reveal-how-buildings-across-the-united-states-do-and-could-use-energy.html ("Buildings are responsible for 40% of total energy use in the United States, including 75% of all electricity use and 35% of the nation's carbon emissions.") (last visited December 5, 2023); U.S. Energy Information Administration ("EIA"), Frequently Asked Questions (FAQS), *How much energy is consumed in U.S. buildings?*, at https://www.eia.gov/tools/faqs/faq.php?id=86&t=1 (last visited December 5, 2023) (residential and commercial buildings consumed 38% of total U.S. energy in 2022); US Department of Energy: 2011 Building Energy Data Book 1-1, *at* http://web.archive.org/web/20130214012611/http://buildingsdatabook.eren.doe.gov/DataBooks.aspx ("Forty-one percent of U.S. primary energy was consumed by the buildings sector") (last visited December 5, 2023); United Nations Environment Programme, Buildings and Climate Change, *Summary for Decision-Makers* (2009), at https://wedocs.unep.org/handle/20.500.11822/32152?show=full (last visited December 6, 2023) ("It is estimated that at present, buildings contribute as much as one third of total global greenhouse gas emissions, primarily through the use of fossil fuels during their operational phase.")

global energy consumption which stem from the usage of the equipment, the manufacturing of building materials and transportation."[5] According to a 2018 report, office buildings "consumed more energy than any other type of commercial building."[6] Even when building occupancy fell to historic lows in 2020 (as much as 95%) as a result of the COVID-19 pandemic, "building energy use dropped by just 10% to 20%, according to a [September 2020] study conducted by Johnson Controls."[7] One explanation provided for this "lies in lease terms that require landlords to provide heating and cooling even when leased spaces are unoccupied, permit inefficient tenant buildouts, hardwire lights to stay on 24/7, and mandate excessive plug loads (energy used by equipment that is plugged into an outlet)."[8] In addition to operational emissions, some studies have concluded that "embodied energy" – "the energy required to extract, process, manufacture and transport building materials (within the manufacturing stage), associated with the building"[9] – accounts for 10% to 38% of total energy in a conventional building's lifecycle, and 9% to 46% in low-energy buildings.[10]

Certain states have been addressing the buildings sector's energy use through enactment of advanced building codes aimed at reducing carbon emissions, and more recently in the case of California, "embodied" carbon (discussed herein).[11] In August 2023, California's Building Standards Commission approved a novel amendment to California's Green Building Standards Code (CALGreen), effective July 1, 2024, aimed at reducing embodied carbon in large new or remodeled commercial buildings, including alterations and additions to large commercial

[5] Banu Sizirici, Yohanna Fseha, Chung-Suk Cho, Ibrahim Yildiz, and Young-Ji Byron, *A Review of Carbon Footprint Reduction in Construction Industry, from Design to Operation* (Published online October 15, 2021), at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8540435/ (last visited December 18, 2023).

[6] EIA, *Use of energy explained, Energy use in commercial buildings*, *at https://www.eia.gov/energyexplained/use-of-energy/commercial-buildings.php* (last visited December 5, 2023).

[7] Stephanie Oppenheimer, Building Owners and Manager Association ("BOMA"), *Green Leasing Becoming More Collaborative* (Nov. 18, 2022), at https://www.boma.org/BOMAKnowledgeCenter/Topics/Sustainability-Energy-Management/Green_Leasing_Becoming_More_Collaborative.aspx (last visited December 8, 2023); A. Banny, J. Gracer, M. Holden, S. Kaplan, and S. Margolis, Environmental Law in New York, v. 32, No. 6, *High-Performance Leases: A Solution for Reducing Carbon Emissions in Commercial Buildings* (M. Gerrard ed. June 2021), *available at* https://www.imt.org/resources/reducing-carbon-emissions-with-high-performance-leases/ (last visited December 8, 2023); 2020 Johnson Controls Energy Efficiency Indicator Study, COVID-19 pulse survey, at https://www.johnsoncontrols.com/-/media/jci/insights/2020/feature-story/files/hq2010004_eei-2020-media-one-page-summary-v3.pdf?la=en&hash=086EF3E7B0EB35082A6F7213B4FFF24178B65BF2 (two page summary) (last visited December 8, 2023).

[8] *High-Performance Leases: A Solution for Reducing Carbon Emissions in Commercial Buildings*, supra, note 7.

[9] Cassandra Thiel, Nicole Campion, Amy Landis, Alex Jones, Laura Schaefer, and Melissa Bilec, *A Materials Life Cycle Assessment of a Net-Zero Energy Building* (2013), at https://www.mdpi.com/1996-1073/6/2/1125 (last visited February 12, 2024).

[10] *See id.*

[11] US General Services Administration ("GSA"), Sustainable Facilities Tool, *Embodied Carbon*, *at* https://sftool.gov/learn/about/658/embodied-carbon ("Embodied carbon, from building materials and construction, comprises about a third of the built environment's substantial total carbon footprint, and that share is expected to grow as buildings trend toward higher operational efficiency.") (last visited December 4, 2023).

buildings.[12] Such requirements have prompted landlords and tenants to adopt green or "high performance" leasing provisions to comply.[13]

Green leasing, sometimes known as "energy-aligned, energy-efficient, or high performance" leasing, has been described as a "practice of realigning the financial incentives of sustainability or energy measures in lease documents."[14] It has been defined as a "legal agreement between owner and tenant outlining the obligations each party will undertake under the lease to promote energy efficiency and sustainability."[15] Certain industry leaders, such as the Building Owners and Managers Association International ("BOMA"), released green lease guidelines nearly two decades ago,[16] while others, such as Green Lease Leaders (launched in 2014 by the U.S. Department of Energy's Better Buildings Alliance and Institute for Market Transformation ("IMT")), have been developing industry standards for over a decade.[17] Many landlords, tenants and leasing teams have voluntarily incorporated green leasing provisions into commercial leases for various reasons, including in response to market demands, such as tenant demands for more energy efficient spaces and sustainable practices,[18] or to take advantage of cost savings from a decrease in utility costs and the ability to charge higher rents (which can offset the upfront costs of creating a sustainable environment).[19] In 2023, 56 landlords, seven (7) tenants, and eight (8)

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[12] Final Express Terms of the California for Proposed Building Standards of the California Building Standards Commission Regarding the 2022 California Green Building Standards Code, California Code of Regulations, Title 24, Part 11), available at https://lpdd.org/resources/california-embodied-carbon-building-code/?mc_cid=db828c9d53&mc_eid=419a9697b0 (last visited December 11, 2023).

[13] Institute for Market Transformation ("IMT") *Performance-based leasing helps landlords and tenants comply with new building policies*, at https://www.imt.org/performance-based-leasing/ (last visited December 4, 2023).

[14] IMT, *What's in a Green Lease?* (2015), at https://www.imt.org/wp-content/uploads/2018/02/Green_Lease_Impact_Potential.pdf ("Green leasing, also known as energy-aligned, energy-efficient, or high-performance leasing, is the practice of realigning the financial incentives of sustainability or energy measures in lease documents.") (last visited December 4, 2023).

[15] Green lease definition, at https://www.lawinsider.com/dictionary/green-lease (last visited January 19, 2024).

[16] BOMA, *Green Lease Guide: A Guide for Landlords and Tenants to Collaborate on Energy Efficiency and Sustainable Practices*, at https://www.boma.org/GreenLeaseGuide ("In 2005, BOMA greened its model lease to provide the industry with a step-by-step guide on how to execute a lease with sustainability attributes.") (last visited January 19, 2024).

[17] Green Lease Leaders was "[l]aunched in 2014 by the U.S. Department of Energy's Better Buildings Alliance and the Institute for Market Transformation," and "sets the standard for what constitutes a green lease." Green Lease Leaders, https://www.greenleaseleaders.com/about/ (last visited January 19, 2024); *see also id*. https://www.greenleaseleaders.com/green-lease-library/ (last visited January 19, 2024); Audi Banny, IMT's *Green Lease Language Examples* (January 2020), at https://www.imt.org/resources/green-lease-language-examples/ (last visited February 9, 2024).

[18] Institute for Building Efficiency, an initiative of Johnson Controls, *High Performance Tenant Buildouts: a Primer for Tenants* ("Why Go Green?), *at* http://resources.cleanenergyroadmap.com/SCPP_M_High-Performance-Tenant-Buildout-Primer.pdf (last visited December 4, 2023).

[19] Allison Heraty, *Revamping green leases is critical to driving decarbonization* (JLL) (March 20, 2023), at https://www.us.jll.com/en/newsroom/revamping-green-leases-is-critical-to-driving-decarbonization ("The U.S. market could reap $3.3 billion in annual cost savings if every leased office building implemented green leases, as estimated by" IMT) (last visited February 20, 2024); American Council for an Energy-Efficient Economy ("ACEEE") 2020 Summer Study, Collaboration with RE Tech Advisors, US Department of Energy Fellow, and IMT, *New Leasing Languages – How Green Leasing programs Can Help Overcome the Split Incentive*, *at* https://www.imt.org/wp-content/uploads/2020/08/ACEEE-Summer-Study-2020-Final-Paper.pdf ("Estimates of utility cost savings from green leasing range from $0.26–$0.51 per square foot in office space") (last visited February 20, 2024); Nora Knox, U.S. Green Building Council, *Green building costs and savings* (March 25, 2015), *at* https://www.usgbc.org/articles/green-building-costs-and-savings (a 2007 public opinion study by World Business Council for Sustainable Development

teams were recognized by Green Lease Leaders, which recognition program may be viewed as the leasing equivalent to the Leadership in Energy and Environmental Design ("LEED") certification for buildings.[20]

There are various challenges and barriers discussed herein to revamping current lease terms and addressing new lease terms incorporating green lease provisions. But as the United States shifts toward achieving net-zero emissions by 2050,[21] including promoting the use of construction materials with lower embodied carbon, green leasing is likely to play a pivotal role in Decarbonization efforts in the coming decades. Now is the time to address legislation promoting recommended green lease provisions.

Section II of this Memorandum discusses net-zero initiatives at the federal and state level, including green building code requirements related to the construction, alteration, renovation and additions to new and existing buildings and operating standards, showing the importance and necessity of green commercial leases to Decarbonization efforts.

Section III of this Memorandum examines the impact of green leasing on property owners, landlords, and tenants, including the financial and non-financial impact, along with potential challenges to implementation of the model legislation.

Section IV of this Memorandum provides an overview of significant model provisions recommended in the model legislation.

No model legislation is perfect or addresses every issue that may be encountered. In addition, full credit is given to the numerous agencies, organizations, companies, councils, nonprofits, and individuals who have laid the groundwork and been at the forefront of these issues

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found green features add an actual average marginal cost of less than 2%, but a Berkley study analyzing 694 certified green buildings and comparing them with 7,489 other office buildings, found that, on average, certified green office buildings rented for 2% more) (last visited December 5, 2023); Green Lease Leaders, *Landlord Application*, at https://www.greenleaseleaders.com/apply/landlord-application (citing 22% in operational savings from performance-based leases) (last visited February 20, 2024).

[20] Green Lease Leaders, *supra* note 17. *Green* Lease Leaders provides three levels of recognition to landlords, tenants, and teams for green leases, with a three-year recognition period. In 2023, it recognized 56 landlords, 7 tenants, and 8 teams as 2023 Leaders, which "represent portfolios totaling over 3 billion sq. ft. and comprise a diverse range of buildings from large and small commercial offices to industrial buildings to data centers." Green Lease Leaders, *at* https://www.greenleaseleaders.com/leaders/ (last visited December 6, 2023). Green Lease Leaders recognition may be viewed as the equivalent of LEED certification and rating system for buildings. For information on LEED certification, see U.S. Green Building Council, at https://www.usgbc.org/leed ("LEED certification is a globally recognized symbol of sustainability achievement, and it is backed by an entire industry of committed organizations and individuals paving the way for market transformation.") (last visited December 7, 2023).

[21] *FACT SHEET: President Biden Signs Executive Order Catalyzing America's Clean Energy Economy Through Federal Sustainability* (December 8, 2021), *at* *https://www.whitehouse.gov/briefing-room/statements-releases/2021/12/08/fact-sheet-president-biden-signs-executive-order-catalyzing-americas-clean-energy-economy-through-federal-sustainability/* (last visited December 8, 2023); *FACT SHEET: President Biden to Catalyze Global Climate Action through the Major Economies Forum on Energy and Climate* (April 20, 2023), *at* https://www.whitehouse.gov/briefing-room/statements-releases/2023/04/20/fact-sheet-president-biden-to-catalyze-global-climate-action-through-the-major-economies-forum-on-energy-and-climate/#:~:text=President%20Biden%20has%20set%20an,by%20no%20later%20than%202050 ("President Biden has set an ambitious U.S. goal of achieving a carbon pollution-free power sector by 2035 and net zero emissions economy by no later than 2050.") (last visited December 4, 2023).

for decades. The hope is that this model legislation serves as a template to provide the necessary structure for state legislatures to develop model green commercial lease provisions to aid Decarbonization efforts and assist with compliance of green building code requirements.

## II. Background

In the past few years, the United States has taken more ambitious steps toward attaining net-zero emissions by 2050. In 2018, the Intergovernmental Panel on Climate Change ("IPCC") determined that carbon emissions had to reach net zero by 2050 (2045-2055 range) to limit global warming to 1.5 degrees Celsius, in addition to limits to non-carbon emissions.[22] A few years later, in November 2021, the United States released a report, setting forth its long-term strategy and goal to reach net-zero GHG emissions by 2050, including increasing energy efficiency in buildings.[23] The next month, President Biden signed an Executive Order to reach net-zero emissions in "federal operations" by 2050, including having a "net-zero emissions [federal] building portfolio by 2045."[24] By 2023, the White House had set forth a strategy to accelerate technology aimed at achieving net-zero emissions by 2050, including improving the energy efficiency of buildings, among other sectors,[25] and prioritizing development of "[c]ost-competitive net-zero building construction and operations, including net-zero or net-negative building materials."[26]

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[22] IPCC, 2018: Summary for Policymakers. In: Global Warming of 1.5°C, at C.1, p.12, https://www.ipcc.ch/site/assets/uploads/sites/2/2022/06/SPM_version_report_LR.pdf (last visited December 19, 2023). "An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 3-24. https://doi.org/10.1017/9781009157940.001."

[23] *The Long-Term Strategy of the United States, Pathways to Net-Zero Greenhouse Gas Emissions by 2050* (published by the United States Department of State and the United States Executive Office of the President, Washington DC. November 2021), at https://www.whitehouse.gov/wp-content/uploads/2021/10/US-Long-Term-Strategy.pdf (Chapter 2, Section 2.3, p. 15 for building goals) (last visited December 19, 2023).

[24] *FACT* SHEET*: President Biden Signs Executive Order Catalyzing America's Clean Energy Economy Through Federal Sustainability* (December 8, 2021), at *https://www.whitehouse.gov/briefing-room/statements-releases/2021/12/08/fact-sheet-president-biden-signs-executive-order-catalyzing-americas-clean-energy-economy-through-federal-sustainability/* (last visited December 8, 2023).

[25] *National Innovation Pathway of the United States* (published by National Office of Science and Technology Policy, in conjunction with the United States Department of Energy and Department of State), at https://www.whitehouse.gov/wp-content/uploads/2023/04/US-National-Innovation-Pathway.pdf (last visited January 26, 2024).

[26] *See id.*, p. 17 (Table 4, "Representative Clean Energy Innovation Priorities"). In furtherance of these goals, for fiscal year 2022, the Department of Energy ("DOE") budgeted $308 million for research and development by the Building Technologies Office, and the DOE announced $32 million to fund over 30 building retrofit projects. *See id.; DOE Awards $32 Million to Accelerate Next-Generation Building Upgrades (March 14, 2022)*, at https://www.energy.gov/articles/doe-awards-32-million-accelerate-next-generation-building-upgrades (last visited December 19, 2023). The DOE further announced that "[s]even awardees will test renovation techniques that reduce disruption to tenants while upgrading the energy and environmental performance of buildings more quickly, affordably, and effectively." *DOE Awards $32 Million to Accelerate Next-Generation Building Upgrades (March 14, 2022), supra.* It was reported that the developed techniques could "provide the means to decarbonize America's 130 million buildings at the rate needed to address the climate crisis and meet President Biden's goals of a net zero carbon economy by 2050." *Id.*

At the state level, at least twenty-four states (24) plus the District of Columbia have enacted laws aimed at reducing greenhouse gas emissions, with similar net-zero goals by 2045 or 2050.[27] "For years, U.S. states and regions have been addressing climate change in the absence of stronger federal action," including measures to promote more energy efficient buildings.[28] Indeed, California's Building Standards Commission ("CBSC") developed the "first-in-the-nation" green building standards code as early as 2009, CALGreen (Part 11, Title 24, California Code of Regulations),[29] initially providing voluntary standards for GHG emission reductions but later including certain mandatory standards (effective 2011).[30] By 2014, "to capture a greater number of California's buildings and to increase sustainable construction in the state,"[31] certain requirements were extended to include building additions over 1,000 square feet or alterations with permit values of $200,000.00 or greater.[32]

[27] *See* Center for Climate and Energy Solutions, *State Climate Policy Maps*, at https://www.c2es.org/content/state-climate-policy/ (last visited December 19, 2023).
[28] *See id.*
[29] *CBSC's History of the California Green Building Standards Code (CALGreen)* (2007 to present), at https://www.dgs.ca.gov/BSC/About/History-of-the-California-Green-Building-Standards-Code-CALGreen (CBSC's authority was granted to it under California's climate change bill, Assembly Bill 32 (2007) and subsequent Senate Bill 1473, Statutes of 2008) (last visited December 8, 2023).
[30] *See id.*; *see also* Andrea Ward, *Building Green, California Adopts Nation's First Statewide Green Building Code*, at https://www.buildinggreen.com/newsbrief/california-adopts-nations-first-statewide-green-building-code (last visited December 19, 2023); *History of the California Green Building Standards Code (CALGreen)*, *supra* note 29 (providing that the mandatory requirements "ensured that new construction projects in California would be built in compliance with sustainable construction practices.")
[31] *History of the California Green Building Standards Code (CALGreen)*, *supra* note 29.
[32] *See id.; see also* Chapter 3 Green Building, Section 301.3 Nonresidential additions and alterations, and Chapter 5 Nonresidential Mandatory Measures, CALGreen, available at https://www.ladbs.org/docs/default-source/publications/code-amendments/2013-california-green-building-standards-code.pdf?sfvrsn=7a02fc53_7 (last visited December 11, 2023); International Code Council, *CALGreen Verification Guidelines Mandatory Measures Checklist*, at https://codes.iccsafe.org/content/CAGBC2022P1/appendix-a5-nonresidential-voluntary-measures (providing a checklist of mandatory requirements that meet the 1,000 sq feet or $200,000 or more permit valuation threshold) (last visited December 8, 2023); 2022 California Green Building Standards Code Nonresidential Mandatory Measures, Sheet 1 (January 2023), at https://calgreenenergyservices.com/wp/wp-content/uploads/AIA-CA-2022-GBC-Requirements-NonResidentialMandatoryMeasures_Jan2023.pdf (last visited February 2, 2024).

Other states and cities,[33] such as Hawai'i,[34] Washington,[35] New York,[36] Maryland,[37] and the District of Columbia,[38] likewise have led the charge, with laws focusing on reduction of GHG emissions in large commercial buildings, typically over 20,000 square feet (though some, such as D.C. will go down to 10,000 square feet by 2026).[39] As some examples, Maryland's Climate Now Solutions Act of 2022 requires a 60% reduction in GHG emissions by 2031, with a statewide net-zero emissions requirement by 2045.[40] New York City's Local Law 97 of 2019, provides, effective January 1, 2024, for a 40% reduction in aggregate GHG emissions for covered buildings by 2030 and an 80% citywide emissions reduction by 2050.[41] The District of Columbia Law 22-257 commits to reducing GHG emissions by 50% by 2032, and obtaining 100% of its energy supply from renewable energy sources by 2032, with at least 10% of that energy coming from solar energy

[33] Numerous cities have passed Building Performance Standards, including Seattle, WA, Chula Vista, CA, Denver, CO, St. Louis, MO, Montgomery County, MD, Washington, D.C., New York, NY, Cambridge, MA, and Boston, MA, and others are committed to passing the same by 2026. *See* JLL, *Future-proof your investments*, at https://www.us.jll.com/en/trends-and-insights/cities/future-proof-your-investments ("Today, about 13 cities in the U.S. already have a BPS [Building Performance Standards] in place and over 30 more U.S. cities have committed to passing such standards by 2026 or earlier.") (last visited August 2, 2024); *see also* Lesley Baulding, LEED Legislation by City: See Where LEED Certification is Required (June 18, 2015), at https://everbluetraining.com/cities-requiring-or-supporting-leed-2015-edition/ (providing dozens of cities' legislation, dating back as early as 2004 and 2005, requiring LEED certification of municipal and commercial buildings).

[34] *See* Hawaii State Building Code Council adopts the 2018 International Energy Conservation Code ("IECC"), with a pending recommendation to update it to 2021 IECC with amendments (https://energy.hawaii.gov/what-we-do/energy-efficiency/hawaii-energy-building-code-iecc-updates/) (including links to the adoption of the 2018 IECC and amendments and proposed adoption of the 2021 IECC and amendments) (last visited December 15, 2023).

[35] *See* Washington's Clean Buildings Performance Standard, at https://www.commerce.wa.gov/growing-the-economy/energy/buildings/clean-buildings-standards/ and https://deptofcommerce.app.box.com/s/tmxletsmxoml5n4zky187kpj9qlotk7p) (last visited December 15, 2023); Washington's 2019 Clean Buildings law (Chapter 285, Laws of 2019), at https://lawfilesext.leg.wa.gov/biennium/2019-20/Pdf/Bills/Session%20Laws/House/1257-S3.SL.pdf?q=20221202112237 (last visited December 15, 2023).

[36] New York (Local Law 97 of 2019), at https://www.nyc.gov/site/sustainablebuildings/ll97/local-law-97.page (last visited January 19, 2024).

[37] Maryland (Climate Now Solutions Act of 2022, SB0528), at https://mgaleg.maryland.gov/mgawebsite/Legislation/Details/sb0528?ys=2022RS and Fiscal and Policy Note, at https://mgaleg.maryland.gov/2022RS/fnotes/bil_0008/sb0528.pdf (last visited January 19, 2024).

[38] D.C. Law 22-257, at https://code.dccouncil.gov/us/dc/council/laws/22-257#:~:text=To%20amend%20the%20Renewable%20Energy,consider%20in%20making%20decisions%3B%20to (last visited January 19, 2024).

[39] *See, e.g.*, New York (Local Law 97 of 2019), *supra* note 36 (setting limits on greenhouse gas emissions and reporting requirements for most covered buildings 25,000 square feet or more); Maryland (Climate Now Solutions Act of 2022) and Fiscal and Policy Note, *supra* note 37 (requiring compliance with state standards and reporting requirements for greenhouse gas emissions from commercial buildings or multifamily residential buildings over 35,000 square feet); D.C. Law 22-257, *supra* note 38 (applying, as of January 1, 2023, to privately owned buildings over 25,000 square feet, and after January 1, 2026, it will apply to all privately-owned buildings over 10,000 square feet); Washington's 2019 Clean Buildings law (Chapter 285, Laws of 2019), *supra* note 35 (last visited December 15, 2023) and Chapter 177, Laws of 2022, available at https://lawfilesext.leg.wa.gov/biennium/2021-22/Pdf/Bills/Session%20Laws/Senate/5722-S.SL.pdf?q=20221202113059 (last visited December 15, 2023) (enacting requirements to meet the states greenhouse gas emissions limits, originally applying to larger commercial buildings over 50,000 square feet, but as of 2022, the legislature expanded it to include buildings of 20,000 to 50,000 square feet); *see also* Washington's Clean Buildings Legislative Report (2023), p. 2, at https://deptofcommerce.app.box.com/s/tmxletsmxoml5n4zky187kpj9qlotk7p (last visited February 20, 2024).

[40] Maryland (Climate Now Solutions Act of 2022) and Fiscal and Policy Note, *supra* note 37.

[41] New York (Local Law 97 of 2019), *supra* note 36.

by 2041.[42] Not all codes are clear on whether or how they apply to alterations, renovations and additions.[43]

None of these laws, however, have gone as far as California's recent amendments to CALGreen. In August 2023, CBSC approved novel amendments to CalGreen, effective July 1, 2024, limiting the amount of "embodied" carbon in new or remodeled commercial buildings of at least 100,000 square feet until 2026, which will be reduced to 50,000 square feet by 2026,[44] with a goal of achieving 40% net reduction of embodied carbon by 2035.[45] Embodied carbon has been defined as "[c]arbon emissions associated with materials and construction processes throughout the whole lifecycle of a building or infrastructure."[46] That includes "material extraction, "transport to manufacturer," "manufacturing," "transport to site," "construction," "use phase" such as "concrete carbonation but excluding operational carbon," "maintenance," "repair," "replacement," "refurbishment," "deconstruction," "transport to end of life facilities," "processing," and "disposal."[47]

The California amendments also require compliance with certain sections of CalGreen for alterations or additions to buildings with a combined floor area of at least 100,000 square feet, or 50,000 square feet by 2026.[48] Pertinent sections that apply to alterations and additions require reuse of at least 45 percent combined of the existing building's primary structural elements (Section 5.105.2), conducting a whole building life cycle assessment, excluding operating energy, showing at least a 10% reduction in "global warming potential" ("GWP") compared to similar

[42] D.C. Law 22-257, *supra* note 38.

[43] IMT, Energy Code Enforcement for Renovations, Alterations, and Additions of Existing Buildings, at https://www.imt.org/wp-content/uploads/2018/02/Existing_Building_Energy_Code_Enforcement.pdf ("The energy code may not clearly articulate how it applies to alterations, renovations, and additions, resulting in confusion and a lack of awareness among the building industry.") (last visited January 4, 2024).

[44] LPDD, *California Embodied Carbon Building Code*, at https://lpdd.org/resources/california-embodied-carbon-building-code/?mc_cid=db828c9d53&mc_eid=419a9697b0 (last visited February 20, 2024).

[45] *Id.* (including a link to the CBSC's Final Express Terms of the California for Proposed Building Standards of the California Building Standards Commission Regarding the 2022 California Green Building Standards Code, California Code of Regulations, Title 24, Part 11) (last visited December 11, 2023); Section 1(5), Assembly Bill 2446, approved September 16, 2022, to add Section 38561.3 to the Health and Safety Code, relating to greenhouse gases, available at https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220AB2446 (last visited December 11, 2023) (requiring, under subsection (a)(1) "develop[ment] [of] a framework for measuring and then reducing the average carbon intensity of the materials used in the construction of new buildings, including those for residential uses, compared to the baseline.") "The framework shall include a comprehensive strategy for the state's building sector to achieve a 40-percent net reduction in greenhouse gas emissions of building materials as soon as possible, but no later than December 31, 2035." *Id.*

[46] World Green Building Council, *Bringing Embodied Carbon Upfront Coordinated action for the building and construction sector to tackle embodied carbon*, p.5, (World Green Building Council & Ramboll 2019), available at https://worldgbc.org/advancing-net-zero/embodied-carbon/ (last visited January 30, 2024)

[47] *See id.*

[48] Final Express Terms of the California for Proposed Building Standards of the California Building Standards Commission Regarding the 2022 California Green Building Standards Code, California Code of Regulations, Title 24, Part 11), at https://lpdd.org/resources/california-embodied-carbon-building-code/?mc_cid=db828c9d53&mc_eid=419a9697b0 (last visited December 11, 2023); other states, such as Hawaii, likewise contain provisions affecting "alterations, repairs, additions, and changes of occupancy," *see* C501.2 Compliance, https://energy.hawaii.gov/wp-content/uploads/2023/02/Final-amendments-to-2021-IECC-Proposed-2.7.23.pdf (last visited December 15, 2023).

buildings (Section 5.409.2), or having a "Type III environmental product declaration" showing that products are GWP compliant (Section 5.409.3).[49]

Although California's amendments may be the first, they may not be the last. As more states and cities evaluate how to achieve net zero goals, and as momentum grows at the federal level to decarbonize buildings,[50] with the U.S. Energy Department recently issuing a definition of a "zero emissions building,"[51] other states and municipalities may follow.[52] For instance, the State of Hawai'i has included an emphasis on integrating sustainable design principles in new and existing buildings in 2050, including limitations of embodied carbon in new construction.[53] Moreover, as of July 2024, it has been reported that about thirteen (13) cities have passed Building Performance Standards, "mandate[ing] specific building-level energy use and emissions reductions," and another thirty (30) are developing them by 2026 to meet climate goals.[54] Laws in three leading cities, including New York City's Local Law 97, effective 2024, Boston's Building Emissions Reduction and Disclosure Ordinance (BERDO), effective 2025, and Seattle's Building

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[49] *See* Final Express Terms of the California for Proposed Building Standards of the California Building Standards Commission Regarding the 2022 California Green Building Standards Code, California Code of Regulations, Title 24, Part 11), *supra* note 48, pp. 5, 13-14.

[50] *See* Section 1(12), Assembly Bill 2446, available at https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220AB2446 (recognizing "momentum at the federal and state levels to decarbonize the building sector") (last visited December 11, 2023); *National Innovation Pathway of the United States*, p. 17 (Table 4, "Representative Clean Energy Innovation Priorities"), *supra* note 25 (setting forth the federal priority of net-zero building construction and operations, including net-zero or net-negative building materials).

[51] *See* U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy, at https://www.energy.gov/sites/default/files/2024-06/bto-national-definition-060524.pdf (last visited July 31, 2024) (providing the more comprehensive definition and criteria to guide the public and private entities); Office of Energy Efficiency & Renewable Energy, *National Definition of a Zero Emissions Building*, at https://www.energy.gov/eere/buildings/national-definition-zero-emissions-building (last visited July 31, 2024) ("At a minimum, a building that achieves zero operational emissions from energy use must be: 1. Energy efficient. 2. Free of on-site emissions from energy use. 3. Powered solely from clean energy. Implementation guidance included with the Definition provides additional information on the criteria."); Paul Bubny, *U.S. Energy Department Issues Definition of a Zero Emissions Building* (June 6, 2024), at https://www.connectcre.com/stories/u-s-energy-department-issues-definition-of-a-zero-emissions-building/ (last visited July 31, 2024).

[52] In addition to building reporting requirements, California recently enacted legislation requiring certain businesses operating in the state to disclose GHG emissions. Specifically, in October 2023, California enacted laws, effective January 1, 2025, that would require businesses operating in California with total annual revenues over $1 billion to disclose their GHG emissions to a reporting agency (SB 253, the Climate Corporate Data Accountability Act (CCDAA)). *See* SB 38532, approved on October 7, 2023, at https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202320240SB253 (last visited February 8, 2024); https://www.gov.ca.gov/wp-content/uploads/2023/10/SB-253-Signing.pdf (last visited February 8, 2024); SB 261, approved on October 7, 2023, at https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202320240SB261 (last visited February 8, 2024); https://www.gov.ca.gov/wp-content/uploads/2023/10/SB-261-Signing.pdf (last visited February 8, 2024).

[53] *See* Strategy 23, p. 103 of Hawai'i 2050 Sustainability Plan: Charting a Course for the Decade of Action (2020-2030), at https://hawaii2050.hawaii.gov/ (last visited December 19, 2023).

[54] *See* JLL, *Future-proof your investments*, at note 33 ("Today, about 13 cities in the U.S. already have a BPS [Building Performance Standards] in place and over 30 more U.S. cities have committed to passing such standards by 2026 or earlier.") (last visited August 2, 2024); Nish Amarnath, *U.S. cities sharpen focus on building performance standards to meet net-zero goals* (July 25, 2024), at https://www.facilitiesdive.com/news/us-cities-building-performance-standards-net-zero-emissions/722404/ ("Over 40 cities will have these standards in place by 2026, compelling building owners to prioritize energy efficiency and emissions reduction measures, according to a report from JLL.") (last visited August 2, 2024);

Emissions Performance Standard (BEPS), adopted in 2023 and taking effect in 2031, likewise will begin imposing penalties for noncompliance with emission limits.[55] "As of early 2024, [] policies [to meet climate targets] cover about 25% of all buildings in the U.S."[56]

As further states and cities consider amendments to advance green features in building codes, this inevitably raises questions about costs to and impact on interested parties, including landlords and tenants. Some state legislatures have considered the financial impact. For example, Washington considered the "split incentive issue" – "in which tenants are responsible for energy costs and building owners are responsible for choices about energy systems and building maintenance" – when amending its building code in 2022 to decrease the square footage requirement of "covered buildings" to 20,000 square feet or more.[57] California also considered the economic impact of reducing embodied carbon when enacting its recent amendments, including finding that a reduction can be accomplished without any increased cost to the owner through "conscious design to reduce materials used" and use of "low-carbon construction materials."[58] Although the basis for those findings are not specified, this memorandum explores the financial and nonfinancial impact on landlords, tenants, and other parties-in-interest as discussed in various studies and articles, along with potential challenges that parties may face in going green.

## III. Green Leasing's Impact on Landlords, Tenants, and Other Parties-in-Interest, Including Challenges and Barriers

A number of barriers to sustainable practices have been cited, including affordability.[59] Indeed, when it comes to the cost of sustainable buildings, a 2007 public opinion survey showed that respondents from eight (8) countries believed that a certified sustainable building would add 17% more to costs, with respondents from the United States alone believing it would add 16% more.[60] Nonetheless, various studies have shown that the actual upfront costs range from about

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[55] *Future-proof your investments*, *supra* note 54.

[56] *See id.*

[57] Sec. 1, p.1, *Buildings-Energy Management and Benchmarking* (Chapter 177, Laws of 2022), at https://lawfilesext.leg.wa.gov/biennium/2021-22/Pdf/Bills/Session%20Laws/Senate/5722-S.SL.pdf?q=20221202113059 (last visited December 15, 2023).

[58] *See* Section 1(10) of Assembly Bill 2446, *supra* note 50. California further considered economic benefits to the State through "a growing market for low-carbon building materials." *Id.*

[59] *See* Mohammadsoroush Tafazzoli Ph.D., LEED AP, ENV SP, *Accelerating the Green Movement: Major Barriers to Sustainable Construction* (Washington State University 2018, 54th Annual International Conference Proceedings), p. 315, at http://ascpro0.ascweb.org/archives/cd/2018/paper/CPGT120002018.pdf (*see* Table 1, *Major Barriers to thriving of sustainability practices in the literature*, citing institutional factors [2002 publication from Netherland], lack of legal requirements to report sustainability [2005 publication from Hong Kong], lack of consideration of sustainable measures by stakeholders [2007 publication from England], low affordability [2009 publication from England], costs for the contractors [2009 publication from Netherland], and lack of funding [2011 publication from England]) (last visited February 20, 2024).

[60] Nora Knox, *Green Building Costs and Savings* (U.S Green Building Council 2015), at https://www.usgbc.org/articles/green-building-costs-and-savings (citing a 2007 public opinion survey by the World Business Council for Sustainable Development finding that respondents believed that green features added 17% to the cost of a building) (last visited December 19, 2023); World Business Council for Sustainable Development, *Energy Efficiency in Buildings, Facts & Trends*, p. 18, at http://docs.wbcsd.org/2007/10/EEB_FactsTrends-Summary.pdf (finding that, when asked the question of "How much more do you think a certified sustainable building would costs to build relative to a normal building?," the overall response was 17% from respondents from France, Germany, Spain,

2% (and up to 6.5% on the higher end), with cost savings from increased energy efficiency ranging from roughly 11-30% or more, increased rental rates of approximately 2% or more, and increased occupant satisfaction. The studies and findings supporting these figures follow.

*Financial Impact: Upfront Costs Average 2%, Which Can Be Offset by Increased Rents, With Cost-Savings Ranging From 11-30%*

The following sources report an average upfront cost of green buildings in the United States of approximately 2%, which can be offset by increased rents of 2% or more:

- A 2003 paper published for the Massachusetts' state development agency for renewable energy (the "2003 Report") found an average premium for green buildings of slightly less than 2%, or $3-5/square foot, following a sampling of the costs of 33 green buildings across the United States obtained from contacting "several dozen building representatives and architects."[61]

- In 2009, Urban Green Council, with funding from the New York State Research and Development Authority, studied the cost of building green in New York City, analyzing data on 107 projects throughout 2008 involving luxury high-rise residential and commercial interiors, finding no statistically significant difference in the cost per square foot between building green and non-green.[62]

- In a 2013 report by the World Green Building Council (the "2013 Report"), reviewing research findings from studies published between 2000 to 2021 from the United States, United Kingdom, Australia, Singapore, and Israel, actual design and construction costs for green buildings ranged from -.4% to 12.5%, with the latter corresponding to "zero carbon" performance, and the majority falling within the range of 0% to 4% in actual cost premiums for a wide variety of building types.[63]

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the United States, Brazil, China, India and Japan, and 16% from the United States alone) (last visited February 20, 2024).

[61] Gregory H. Kats, *Green Building Costs and Financial Benefits* (2003), p. 3, at https://www.wbdg.org/files/pdfs/green_bldg_costs_kats.pdf (sponsored by Barr Foundation, Environment Business Council of New England, Inc., Equity Office Properties, Massachusetts Technology Collaborative, and Massport, and in cooperation with the City of Boston Green Buildings Task Force among others) (last visited December 20, 2023). The paper reviewed a "major" 2003 report led by Capital E, a national clean technology deployment and strategy firm, and prepared in partnership with the US Green Building Council and California's Sustainable Building Task Force for 40+ California state agencies. Mr. Kats is further noted as the "founding Principal of Capital E, a national clean technology deployment and strategy firm," and as having "served from 1996 to 2001as the Director of Financing for the $1.1 billion dollar Office of Energy Efficiency and Renewable Energy at the US Department of Energy - the largest clean technology R&D and deployment program in the US." *Id.* p. 2, n.1. He is also is noted as "Chair of the Energy And Atmosphere Technical Advisory Group for LEED and serves on the LEED Steering Committee." *Id.*

[62] *See* Urban Green Council, *Cost of Green in NYC* (200), at https://www.urbangreencouncil.org/cost-of-green-in-nyc/ ("This report found no significant difference in the cost per square foot between green and non-green buildings, based on an analysis of luxury high-rise residential and commercial interiors projects.") (last visited July 29, 2024).

[63] World Green Building Council, *The Business Case for Green Building: A Review of the Costs and Benefits for Developers, Investors and Occupants* ("*The Business Case for Green Building*"), pp. 21-22 and Figure 1 (2013), at https://worldgbc.org/article/the-business-case-for-green-building-a-review-of-the-costs-and-benefits-for-developers-investors-and-occupants/ (last visited July 31, 2024). In general, the higher levels of certification (including LEED

In addition, various studies conducted five years prior reflect a range of rental premiums from 0%-17%, with one deviation in Australia that received a lower energy-only rating.[64]

- In a 2015 article by the U.S. Green Building Council, which developed the LEED sustainable building rating system, it cites "a study of 146 green buildings [that] found an actual average marginal cost of less than 2%," and a study by the University of California–Berkeley analyzing and comparing 694 certified green buildings to 7,489 office buildings within the vicinity that "found that, on average, certified green office buildings rented for 2% more than comparable nearby buildings."[65]

- In a 2019 study outside of the United States comparing 336 green-certified commercial buildings in the United Kingdom to 200 non-certified construction projects built between 2003 and 2014, the researchers found that green buildings averaged 6.5% more to build, but they could rent for 13.3-36.5% more.[66]

- In a 2023 report by JLL Research, it found that "[a]verage rental premiums for green-certified, class A office stock across 8 major markets in the U.S. and Canada" were +7.1%.[67] Moreover, in New York, JLL found that demand for low carbon buildings, "at an estimated 2.2 million square meters by 2030, is expected to be twice the current development pipeline of suitable space."[68]

The upfront premium cost of sustainable features can depend on the level of certification sought by Third Party Rating Systems, ranging from .66% for the lowest level to 6.5% for the

Silver/Gold) may range from 0% to 10%, with the highest levels (including LEED Platinum) ranging from 2% to 12.5% range. *See id.*, p. 22.

[64] *See id.* p. 40. The deviation in Australia was from a lower NABERS rating, which is Australia's leading building performance rating. *See What is NABERS?*, at https://www.nabers.gov.au/about/what-nabers (last visited July 31, 2024).

[65] *Green Building Costs and Savings*, *supra* note 60.

[66] Maya Fischhoff, Network for Business Sustainability, *Green Building Has a Strong Business Case* (May 5, 2020), at https://nbs.net/green-building-has-a-strong-business-case/ (citing the November 2019 study by Andrea Chegut, Piet Eichholtz, and Nils Kok, *The price of innovation: An analysis of the marginal cost of green buildings* (Journal of Environmental Economics and Management, vol. 98, November 2019), available at https://www.sciencedirect.com/science/article/abs/pii/S0095069618304029) (last visited December 20, 2023).

[67] JLL Research (2023), JLL's Sustainability and Value – London Offices Investment report, *The commercial case for making buildings more sustainable*, at https://www.LL's Sustainability and Value – London Offices Investment reportjll.co.uk/en/trends-and-insights/research/the-commercial-case-for-sustainable-buildings (last visited July 31, 2024); World Economic Forum, *Why 2024 is the tipping point for investing in sustainable buildings* (January 22, 2024), at https://www.weforum.org/agenda/2024/01/sustainable-office-buildings/ (last visited July 31, 2024).

[68] See JLL Research, *The commercial case for making buildings more sustainable*, *supra* note 67.

highest level (Platinum), with 2% being the mean average (Silver and Gold).[69] LEED certification requirements vary by city and state.[70]

Other sources report energy savings of green features ranging from 11-30%. Some examples follow:

- Hewlett-Packard reports that although sustainable construction can cost about 2% more, when considering lifecycle costs with an average of 14% to 19% in operational savings, that upfront cost actually is less.[71]

- IMT and the Council of Smaller Enterprises estimate that green leases can reduce utility bills by up to $0.51 per square foot and reduce energy consumption in an office building by 11-22%.[72]

- In the 2003 Report, the researchers conducted a "detailed review of 60 LEED rated buildings," which showed that, on average, the buildings are 25-30% more energy efficient.[73] Using 30% less energy for a 100,000 square foot state office building in Massachusetts (where the average annual energy cost is approximately $2.00/square foot) amounted to $60,000 in annual savings, "with a 20-year present value of expected energy savings at a 5% real discount rate worth about three quarters of a million dollars."[74] The "financial benefits of green design are between $50 and $70 per square foot in a LEED building, over 10 times the additional cost associated with building green," which comes from "lower energy, waste and water

[69] *Green Building Costs and Financial Benefits*, *supra* note 61 (providing average premium green costs ranging from .66% - 6.5% from Level 1 to Level 4 certification); Eric Rosenkranz, *Leadership in Energy and Environmental Design ("LEED") Certification Costs: The Price for Going Green* (Feb. 15, 2023), at https://smart-cre.com/leed-certification-costs-the-price-for-going-green/ (providing that, on average, green buildings are 2% more expensive, but the higher the LEED certification, which fees can range from $10,000 – $30,000, the higher the cost).

[70] *See, e.g.*, LEED Legislation by City: See Where LEED Certification is Required, *supra* note 33 (providing various city legislation requiring LEED certification as of 2015); Office of Governor of Edmund G. Brown Jr., Executive Order B-18-12 (published April 25, 2012), at https://www.ca.gov/archive/gov39/2012/04/25/news17508/index.html (requiring Silver LEED certification or higher for state buildings and "build-to-suit leases" over 10,000 square feet and ordering state agencies to take measures to achieve net zero) (last visited December 21, 2023); State of California Green Buildings, at https://green.ca.gov/buildings/resources/leed/ ("New or renovated [state] buildings and leases more than 10,000 square feet and existing buildings and leases more than 50,000 square feet must be LEED certified under Governor Brown's executive order.") (last visited December 21, 2023).

[71] Hewlett Packard, *Cost of Sustainable Construction: Is It More Expensive?*, at https://largeformat.hp.com/in/blog/cost-of-sustainable-construction-is-it-more-expensive (last visited December 19, 2023).

[72] IMT and the Council of Smaller Enterprises, *Making Efficiency Work for You*, p. 7 at https://www.imt.org/wp-content/uploads/2018/02/Making_Efficiency_Work_for_You.pdf (last visited December 20, 2023); *see also* Andrew White, Allison Kirby, Hannah Debelius, Jake Duncan, Rory Gahagan, *New Leasing Languages – How Green Leasing Programs can Help Overcome the Split Incentive* (ACEEE 2020 Summer Study) at https://www.imt.org/wp-content/uploads/2020/08/ACEEE-Summer-Study-2020-Final-Paper.pdf (providing potential energy savings average per building across the entire market of 11.4 – 22.3%) (last visited December 21, 2023).

[73] *Green Building Costs and Financial Benefits*, p. 4, *supra* note 61.

[74] *See id.*

costs, lower environmental and emissions costs, and lower operational and maintenance costs and increased productivity and health."[75]

- In a 2010 study of green building performance of 22 General Service Administration Buildings, the study found that sustainably designed buildings "use[d] less energy and water, cost less to maintain, and have occupants that are satisfied when compared to typical buildings."[76] Aggregate operation costs were 19% lower than industry average, and sustainable buildings performed better, with 25% better energy performance, lower water use, and occupancy satisfaction.[77]

- In the 2013 Report, the World Green Building Council further found that "[e]stimates for the reduction in a green building energy's use compared to a conventional code-compliant building range from 25% - 30% (based on LEED-certified buildings in the United States) to up to 35%-50% (based on a similar study of green buildings in New Zealand).[78] Moreover, as cited therein, in a more recent study by Kats (2010), who authored the 2003 Report, water consumption savings from such things as "water reuse and water-efficient plumbing fixtures" were estimated at 39% over a conventional building.[79]

- In 2019, the International Finance Corporation ("IFC") found that "[s]tudies and evidence across several markets suggest that to build green could range from savings of 0.5 percent to 12 percent in additional costs,"[80] citing a 2013 study.[81]

- In a 2021 report drawing data from 1,207 respondents in an online survey from June to August 2021, Dodge Construction Network, a provider of commercial construction project data, market forecasting & analytics, found an average reduction in operating costs in the first 12 months for new green buildings of 10.5%, with 16.9% in operational cost savings in five years.[82]

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[75] *See id.*, p. 8.

[76] Kim M. Fowler, Emily M. Rauch, Jordan W. Henderson, Angela R. Kora, *Re-Assessing Green Building Performance: A Post Occupancy Evaluation of 22 GSA Buildings*, at p. v, ix, (June 2010 – published September 2011), at https://www.pnnl.gov/main/publications/external/technical_reports/PNNL-19369.pdf (prepared for the GSA under contract with Battelle Memorial Institute) (last visited February 20, 2024).

[77] *Id.*, at p. v, ix, x, xi, xiii. Performance metrics included water, energy, maintenance and operations, waste generation and recycling, occupant satisfaction and occupant commute. *Id.* at viii.

[78] *The Business Case for Green Building*, p. 51, *supra* note 63.

[79] *See id.*

[80] International Finance Corporation, World Bank Group, *Green Buildings A Finance and Policy Blueprint for Emerging Markets*, p. 18 (2019), at https://documents1.worldbank.org/curated/en/586841576523330833/pdf/Green-Buildings-A-Finance-and-Policy-Blueprint-for-Emerging-Markets.pdf (last visited December 18, 2023).

[81] World Green Building Council, *The Business Case for Green Building, A Review of the Costs and Benefits for Developers, Investors, and Occupants*, at https://ukgbc.org/wp-content/uploads/2017/09/World-GBC-Business-Case-for-Green-Buildings.pdf (last visited December 18, 2023).

[82] *World Green Building Trends 2021*, at pp. 1, 5, 7, 49, at https://www.corporate.carrier.com/Images/Corporate-World-Green-Building-Trends-2021-1121_tcm558-149468.pdf (last visited July 31, 2024). Participants in the survey included architects/designers, engineers, consultants, contractors, owners/developers and investors. *See id.*, at 7.

When it comes to retrofits, decision makers tend to expect a payback period of three (3) to five (5) years, according to a 2011 study examining 129 commercial building retrofit reports and surveying organizations that perform energy efficiency retrofits.[83] Despite general concerns about retrofit expenses, "empirical evidence shows that green retrofits are often profitable," with "the large majority of projects report[ing] payback periods of less than five years."[84] Moreover, "Transwestern, a private real estate firm from the United States, reports typical savings of 3% to 15% on the utility bills on its managed properties that have undergone energy performance upgrades."[85] In the 2021 report by Dodge Construction Network, it found that green renovations and retrofits were found to be have strong returns at 11.5% and 17% respectively.[86] Green new buildings and renovation/retrofits also have been shown to increase the value of buildings by more than 9%.[87] Some of the more common retrofits are LED lighting (with proven energy savings and payback), and HVAC (heating, ventilation, and air conditioning) as one of the most expensive per square foot but also one of the most popular given higher energy efficiency, the potential for large energy savings, and a fast payback period.[88] Insulation (i.e., weather stripping, weather sealing, and replacement of old doors and windows) was discussed as having a "quick payback period," with an average cost per square foot similar to solar, though "few people are actually performing insulation retrofits."[89] Solar was considered in the analysis as well, with findings that it is less expensive than HVAC and insulation, and has average year one savings comparable to HVAC, though HVAC still is more common.[90]

*Non-financial Impact: Occupant Satisfaction and Productivity, Retention, and Benefits*

In addition, there is recognition of health and productivity costs of "poor indoor environmental quality (IEQ) in commercial buildings—estimated variously at up to hundreds of billions of dollars per year."[91] The 2003 Report, which relied on "recent meta-studies that have screened tens or hundreds of other studies and have evaluated and synthesized their findings," found the following common attributes in green buildings: (1) "[m]uch lower source emissions" and "better building material source controls," including use of "less toxic materials, low emitting adhesives & sealants, paints, carpets, and composite woods, and indoor chemical & pollutant source control," (2) "[s]ignificantly better lighting quality," (3) "[g]enerally improved thermal comfort and better ventilation," and (4) "better ventilation system performance, heating and air

[83] Adam Benson, Edgar Vargas, James Bunts, Justin Ong, Kelsey Hammond, Lindsey Reeves, Mack Chaplin, and Peter Duan, *Retrofitting Commercial Real Estate: Current Trends and Challenges in Increasing Building Energy Efficiency* (June 1, 2011, Faculty Advisor: Paul Bunje, Director of UCLA's Center for Climate Change Solutions), p. 1, at https://www.ioes.ucla.edu/wp-content/uploads/2016/10/retrofitting-commercial-real-estate.pdf (last visited February 20, 2024).

[84] *Id.* at p. 3, and Figure 8 on p. 20 (classifying the block of California, Nevada, Arizona and Utah within the 2.6-5.8 year retrofit range, and almost all of the east coast within the short-term project range of 0-2.5 years). Only a few states had payback periods around 6 years or more. *See* Figure 8 illustrations and explanations on page 20.

[85] *See The Business Case for Green Building*, p. 52, *supra* note 63.

[86] *World Green Building Trends 2021*, at 1, 28, 49, *supra* note 82.

[87] *See World Green Building Trends 2021*, at 1, 5, *supra* note 82.

[88] *Id.* at pp. 3, 18, 27, 42. The study further mentions installation of an EMS or environmental management system "to monitor energy use and automatically adjust temperature settings accordingly" for cost savings. *Id.*, at p. 3.

[89] *Id.* at p. 3, 25.

[90] *Id.* at p. 3, 18, 25.

[91] *Green Building Costs and Financial Benefits*, p. 4, *supra* note 61.

conditioning from commissioning, measurements and verification, and carbon dioxide monitoring."[92]

Although it is difficult to measure exactly how much the lack of green features contribute to sick days, low productivity, and medical and insurance costs, the 2003 Report found that some of the listed attributes – including increased ventilation (with average productivity gains of 1.8%), temperature control (with average productivity gains of 1.2%), lighting control (with average productivity gains of 7.1%), and daylight ("significant measured improvements") – "have been positively and significantly correlated with increased productivity."[93] "A 1% increase in productivity (equal to about 5 minutes per working day) is equal to $600 to $700 per employee per year, or $3/ft2 per year."[94] "A 1.5% increase in productivity (or a little over 7 minutes each working day) is equal to about $1000 per year, or $4 to $5/ft2 per year."[95]

In a subsequent study from 2009, researchers examined worker productivity based on sick dates and self-reported productivity changes after tenants moved into ENERGY Star labelled or LEED certified (at any level) buildings, relying on a survey from 2009 conducted by CB Richard Ellis and the University of San Diego involving 154 buildings across the country, with over 2,000 tenants (of which 534 tenant responses were collected).[96] The majority of tenants (54.5% of those surveyed) agreed that, after the move, employees were more productive (with 12% of those tenants "strongly" agreeing), and 45% found that they were taking fewer sick days.[97] Being in ENERGY STAR buildings does not ensure less sick time, but being in "highly rated LEED-certified buildings (Gold, Platinum) should exhibit fewer sick days with better light, ventilation, and less contaminated, cleaner air."[98] The researchers concluded that "[h]ealthier buildings reduce sick time and increase productivity."[99] In terms of cost savings, the researchers cited the 2003 Report but further found that, for owner-occupied buildings, the net present value ("NPV") could be higher at over $100 per square foot.[100] For tenants, the results are less clear, but the researchers found "evidence in past studies that suggests that [tenants] do pay premiums" for green features, which if "only 5-10% are a bargain."[101]

In 2010, a similar 2-case study was conducted of employees moving from conventional office buildings to LEED-rated buildings in Lansing, Michigan, with one study conducted of moves to a Platinum-rated building (the highest LEED rating), and the other study conducted of

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[92] *Id.*, p. 5, *supra* note 61.
[93] *Id.*, p. 6, *supra* note 61.
[94] *Id.*, p. 6, *supra* note 61.
[95] *Id.*, p. 7, *supra* note 61.
[96] *See* Norm G. Miller, Dave Pogue, Quiana D. Gough, and Susan M. Davis, *Green Buildings and Productivity*, at 79-87, https://www.tandfonline.com/doi/pdf/10.1080/10835547.2009.12091783 (last visited July 29, 2024); *see also* CB Richard Ellis and Burnham-Moores, Center for Real Estate University of San Diego, *Do Green Buildings Make Dollars and Sense?* (November 6, 2009), *at https://catcher.sandiego.edu/items/business/Do_Green_Buildings_Make_Dollars_and_Sense_draft_Nov_6_2009.pdf* (last visited July 31, 2024).
[97] *See id.*, at 81 (recognizing, however, that other factors, such as management, "can mean as much or more than environmental factors").
[98] *See id.*, at 83.
[99] *See id.*, at 87.
[100] *See id.*, at 87.
[101] *See id.*, at 87-88.

moves to a Silver rated building (the certification rating above the lowest level).[102] The researchers found "substantial reductions in self-reported absenteeism and affected work hours as a result of perceived improvements in health and well-being," and "perceived [] positive effect[s] of their new work environment on their productivity."[103]

In the 2013 Report, analyzing the net present value of the operational cost, productivity, and health benefits of LEED certified buildings, the World Green Building Council found, among other things, 10% to 25% better mental function and memory and 8.5% fewer hospital stays for those with outside views, 18% more worker productivity for workers with better daylight, 23% more productivity for those with better lighting systems, 11% more productivity for those with better ventilation systems, and 3% more productivity for those with individual temperature control.[104]

In a 2015 study by the Harvard T.H. Chan School of Public Health's Center for Health and the Global Environment, SUNY Upstate Medical University, and Syracuse University, researchers examined 24 professional participants decision-making performance in "green" versus "non-green" buildings in a "double-blind study (in which the participants and analysts were "blinded to test conditions to avoid biased results"), and found that cognitive performance "scores for those working in green environments were 61% higher."[105]

In 2018, another analysis conducted by Stōk determined that "by designing for the occupant, owner-occupants and tenants can gain $3,395 per employee in annual profit, or $18.56 per SF in annual profit" due to "occupant productivity, retention and wellness benefits."[106] Those figures are based on an assumption of a company in a 150,000 square foot building or tenant space with 183 square feet per employee.[107] Other reports have cited user wellbeing as a benefit of energy-related renovation measures from things such as "thermal comfort," natural lighting and

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[102] Amanjeet Singh, MS, Matt Syal, PhD, Sue C. Grady, PhD, MPH, and Sinem Korkmaz, PhD, *Effects of Green Buildings on Employee Health and Productivity*, Am J Public Health (September 2010), at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2920980/ (last visited August 2, 2024).

[103] *See id.*

[104] *The Business Case for Green Building*, p. 67m Figure 11, *supra* note 63. Productivity measurements included "work product outcomes, as well as indicators of health (such as absenteeism) and indicators of well-being (including stress levels and mood). *See id.*, at 68.

[105] Harvard T.H. Chan, School of Public Health, Green office environments linked with higher cognitive function scores (October 26, 2015), at https://www.hsph.harvard.edu/news/press-releases/green-office-environments-linked-with-higher-cognitive-function-scores/ (last visited August 2, 2024).

[106] Attema, J.E., Fowell, S.J. Macko, M.J. & Neilson, W.C. (2018). The Financial Case for High Performance Buildings. San Francisco: Stok, LLC, p. 1, at https://stok.com/wp-content/uploads/2022/04/Stok_High-Performance-Buildings-Report.pdf (last visited December 21, 2023); *see also New Leasing Languages – How Green Leasing Programs can Help Overcome the Split Incentive*, *supra* note 72 ("In a study by stok, LLC, a sustainable real estate services company, the quantified value added of high-performance buildings for increasing employee productivity, retention, and wellness surpasses the cost savings from energy improvements. Of the total value added of high-performance buildings, an estimated 43% comes from enhanced employee productivity, 41% from increased employee retention, 7% from improved employee wellness, 7% from utility savings, and 2% from maintenance savings (Attema 2018). Building improvements facilitated by a green lease grow thermal comfort, ventilation, air quality, and movement. According to the report from stok, LLC, these factors each increase occupant productivity by 8%-10% (Attema 2018).")

[107] *Id.*

outdoor contact, indoor air quality, potentially higher noise insulation," and "pride, prestige, reputation."[108]

In a 2023 article published in Harvard's Business Review, research on the incorporation of "micro-nature" (green or natural elements) in the workplace found that "even small doses of nature at work improved the way employees felt in ways that fueled higher task performance, increased helping, and enhanced creativity."[109] The researchers "measured or manipulated contact with nature at work in different ways across multiple studies, with workers in the U.S., Canada, China, New Zealand, and Indonesia."[110] Some larger examples of nature incorporated into commercial spaces include Google's rooftop park at a United Kingdom's headquarters, and L.L. Bean's cut out in the middle of a warehouse to turn it into a courtyard for workers to have views of nature while they work.[111]Specific to landlords and tenants, an independent advisory committee to the U.S. General Services Administration, the High Performance Leasing Task Group, tasked with presenting recommendations to the U.S. commercial office leasing market, cited the following potential benefits to tenants and landlords:[112]

For tenants:

- "Lower energy, water and operating costs";
- "Providing a healthier, more productive workplace";
- "Supporting corporate sustainability goals"; and
- "Demonstrating environmental responsibility to employees and the community"

For landlords:

- "Increasing transparency, building trust with tenants, reducing turnover";
- "Reducing vacancy";
- "Faster lease-up";
- "Enhancing marketability of the building";
- "Lower operating costs which can improve building financial performance/Net Operating Income (NOI)"

[108] Marco Ferreira and Manuela Almedia, *Benefits from Energy Related Building Renovation Beyond Costs, Energy and Emissions*, Energy Procedia 78 (2015), at 2400 (6th International Building Physics Conference, IBPC 2015), at https://www.sciencedirect.com/science/article/pii/S1876610215019311.

[109] *See* Anthony Klotz, Shawn McClean, and Pok Man Tang, *Research: A Little Nature in the Office Boosts Morale and Productivity*, Harvard Business Review (July 21, 2023), at https://hbr.org/2023/07/research-a-little-nature-in-the-office-boosts-morale-and-productivity (last visited August 2, 2024).

[110] *See id.*

[111] *See id.*

[112] GSA High performance lease criteria and sample lease language (December 6, 2016), at https://www.gsa.gov/system/files/GBAC_HP_Leasing_Criteria_-_FINAL.pdf (including potential benefits);

*Other Potential Benefits: Job Growth*

In more recent years, job growth has been cited as a benefit going green, impacting businesses, states and cities. In a recent report from March 2024 – "highlight[ing] cities' successes in creating jobs through climate-friendly retrofits of existing buildings" – "[r]esearch has shown that there has been a 50% increase in green jobs since 2019 in the US, and the Inflation Reduction Act alone is projected to create an average of 912,000 jobs per year over the next decade."[113] "According to a 2023 U.S. Energy and Employment Report, every state saw an increase in clean energy jobs, a sector which grew faster than overall U.S. employment."[114]

*Challenges and Barriers*

Despite these potential benefits, there are additional considerations and barriers.

A primary concern is cost, with larger challenges for existing leases. There are upfront costs of redrafting and renegotiating commercial lease terms,[115] and renegotiation alone may be difficult for commercial leases with longer lease terms and renewal options.[116] There also is the overarching question of who will bear the costs of compliance,[117] known as the split incentive issue,[118] where landlords and tenants may not be aligned.[119] This issue typically arises with pass-through clauses, and may be more of a challenge with triple-net leases[120] but it also comes up with

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[113] C40 Cities, *Mayors' Green building initiatives fuel job grown in the United States, New report highlights cities' successes in creating jobs through climate-friendly retrofits of existing buildings* (March 11, 2024), at https://www.c40.org/news/mayors-green-building-initiatives-fuel-job-growth-united-states/ (last visited August 2, 2024).

[114] *See id.*

[115] *High-Performance Leases: A Solution for Reducing Carbon Emissions in Commercial Buildings*, at 90, *supra* note 7; Craig McDonald, Sean Ivery and Claire M. Gagne, Navigant Consulting Kif Scheuer, Strategic Energy Innovations, 2008 ACEEE Summer Study on Energy Efficiency in Buildings, *Greening Leased Spaces: Opportunities and Challenges*, at 6-149, at https://www.aceee.org/files/proceedings/2008/data/papers/6_291.pdf (discussing barriers including "uncompetitive first costs, split incentives, defining green, lease type diversity, limited availability of qualified properties, and lack of communication between tenants and landlords.") (last visited February 20, 2024).

[116] *High-Performance Leases: A Solution for Reducing Carbon Emissions in Commercial Buildings*, at 90, *supra* note 7 ("Commercial leases are [] generally much longer in duration (five- to 10-year terms often plus renewal options), with high penalties for noncompliance with lease terms.").

[117] *See, e.g.*, Ryan Menges, Why updated building codes have cities seeing green (March 9, 2022), at https://www.csemag.com/articles/why-updated-building-codes-have-cities-seeing-green/ ("The burden of compliance goes to the owners of these structures. However, tenants should also be aware of the potential impact [New York] Local Law 97 can have on future lease negotiations. Especially for multi-tenant buildings, conversations with current or prospective landlords should include specific questions and answers during term sheet negotiations, including: . . . Will the cost of compliance be passed on to tenants through rent increases or other provisions?") (last visited January 9, 2024).

[118] *Greening Leased Spaces: Opportunities and Challenges*, at 6-150, *supra* note 115 ("Leasing is the primary mechanism through which split incentives are created and perpetuated; landlords are either unwilling to cover upfront costs if the tenants alone benefit from the improvements and/or tenants may not be able to modify the property due to the constraints of their lease.").

[119] Consortium for Building Energy Innovation, *Split Incentives and Green Leases, Creating an Energy Savings Win-Win for Owners and Tenants*, at http://cbei.psu.edu/split-incentives-and-green-leases/index.html (last visited February 12, 2024) ("capital improvements that yield energy savings result in one party paying for improvements while the other party receives the benefits of reduced utility costs.")

[120] *Greening Leased Spaces: Opportunities and Challenges*, at 6-150, *supra* note 115; *IMT's Green Lease Language Examples*, *supra* n. 17 (describing pass-through clauses in the green leasing context as "lease additions and amendments

modified gross leases.[121] This is particularly an issue with any improvements or retrofits that require capital expenditures.[122] In certain states like California, there may be additional compliance costs, such as with removing and sorting building components for reuse as one option under the new embodied carbon legislation.[123]

Current economic conditions also may affect upfront costs, including higher interest rates, lower access to capital for green projects, and more building vacancies and turnaround before a landlord or tenant may recoup costs during the payback period. Certain industry leaders, such as BOMA, are supporting legislation to increase small business loans that may be used to cover such efficiency costs and upgrades, such as the Small Business Energy Loan Enhancement Act (H.R. 1491) that would expand small business financing for efficiency projects from $5.5 million to $10 million,[124] but this legislation is still underway. Moreover, businesses, individual, organizations, and public agencies may take advantage of climate-related provisions in the Inflation Reduction Act of 2022 (IRA), with $369 billion of federal funding allocated for climate solutions and environmental justice (and $48 billion of that toward buildings), in the "form of tax credits and

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that ensure the costs of energy efficiency are passed through to the tenant instead of the landlord") (last visited January 18, 2024); *Retrofitting Commercial Real Estate: Current Trends and Challenges in Increasing Building Energy Efficiency*, p. 6, *supra* note 83 ("The split-incentive problem arises in a net lease, when the landlord is indifferent to reducing utility costs that are otherwise paid for by the tenant and the tenant's inability to control overall energy consumption."); BOMA, *Green Lease Guide: A Guide for Landlords and Tenants to Collaborate on Energy Efficiency and Sustainable Practices*, p. 17, n. 78, https://www.boma.org/GreenLeaseGuide (last visited February 5, 2024) (even with a triple net-lease, "the landlord usually has issues of expense exposure, vacancy risk and market positioning that do provide it with other incentives to improve its building," and some have reported that there are "few pure 'gross' leases in use, for good financial reasons . . . .").

[121] *Retrofitting Commercial Real Estate: Current Trends and Challenges in Increasing Building Energy Efficiency*, p. 6, *supra* note 83 ("The split-incentive problem is also apparent in certain modified gross leases where the tenants' utility costs are capped and the tenant therefore has no economic incentive to conserve energy usage subject to the cap (Brooks 2008)).")

[122] Iain Campbell and Koben Calhoun, Harvard Business Review, *Old Buildings Are U.S. Cities' Biggest Sustainability Challenge* (January 21, 2016), at https://hbr.org/2016/01/old-buildings-are-u-s-cities-biggest-sustainability-challenge (last visited January 3, 2024) ("A traditional energy overhaul of a building (retrofits that include replacing mechanical systems, windows, insulation, and other features during a remodel) requires significant investment, and is therefore typically timed with major renovations or capital-intensive building system replacement.") There is a general view that retrofits are too expensive. *Greening Leased Spaces: Opportunities and Challenges*, at 6-149 to 6-150, *supra* note 115. But some sources note that this is a "false belief." *Retrofitting Commercial Real Estate: Current Trends and Challenges in Increasing Building Energy Efficiency*, p. 3, *supra* note 83 ("One of the largest barriers that impedes the adoption of energy efficient retrofits in commercial properties is the building owners' false belief that energy retrofits are too expensive.").

[123] *See* Section 5.105.2, *supra* note 48, p. 5 (reuse is one compliance option). *Compare The Greenest Building: Quantifying the Environmental Value of Building Reuse* (2011), p. 84, at https://living-future.org/wp-content/uploads/2022/05/The_Greenest_Building.pdf (last visited January 9, 2024) (reuse can increase cost savings and can "meaningfully reduce the negative environmental impacts" of building), *with* Kambiz Rakhshan, Jean-Claude Morel, Hafiz Alaka, Rabia Charef, *Components reuse in the building sector – A systematic review* (first published online February 29, 2020), at https://journals.sagepub.com/doi/full/10.1177/0734242X20910463 (last visited January 9, 2024) (reuses also can increase labor costs for sorting "required to carefully remove and sort the recovered building components" on tight schedules, increase storage costs to store equipment to be reused, and increase costs of design).

[124] BOMA, *Support the Small Business Energy Loan Enhancement Act*, https://www.bomaonthefrontline.com/2024/03/02/support-the-small-business-energy-loan-enhancement-act/ (last visited March 5, 2024) ("Our advocates in Washington, D.C., are pushing a high-priority proposal to open funding for energy efficiency projects. . . . H.R. 1491, the Small Business Energy Loan Enhancement Act, would expand financing for small businesses from $5.5 million to $10 million for efficiency projects.").

financing mechanisms, with smaller amounts available as grants."[125] There also may be other available incentives to offset costs, including state-sponsored grants,[126] tax credits,[127] and potentially utilizing Energy Savings Performance Contracting.[128]

In addition, some have suggested that tenants may be reticent to data-share with landlords for confidentiality or other reasons, making it difficult for landlords to meet benchmarking goals and decreasing compliance rates.[129] But this issue may not be as prevalent for commercial tenants of nonresidential buildings, where "the relative sensitivity of energy data from utility meters" has been reported to be the lowest,[130] in addition to compliance with laws requiring data reporting. Moreover, many utility companies voluntarily provide aggregate whole-building data for commercial buildings.[131] A bill has been introduced in at least one state, Vermont, to address the data-sharing issue,[132] and IMT has prepared model legislation on this issue, Model Utility Data Access Law.[133] The United States Environmental Protection Agency ("EPA") also has

[125] C40 Cities and Climate Mayors, Climate Action and the Inflation Reduction Act, A Guide for Local Government Leaders, pp. 2, 7 (October 2022), at https://c40.my.salesforce.com/sfc/p/#36000001Enhz/a/1Q000000ggm5/R0tppOcJtJz8JRz_FJJEpoqEAVvF7O3zEMtCyi6z09E ("With $369 billion for climate solutions and environmental justice, it represents a massive infusion of federal funding intended to leverage billions more in private capital to supercharge the clean energy transition and put us on a path to achieve an estimated 40% emissions reduction by 2030.") (last visited August 2, 2024). "The IRA's climate-related provisions primarily take the form of tax credits and financing mechanisms, with smaller amounts available as grants. The ultimate impact of the IRA depends on which businesses, individuals, organizations, and public agencies take advantage of these incentives." *See id. See C40 Knowledge, Growing the workforce needed for building retrofits: A guide for U.S. cities* (March 2024), at https://www.c40knowledgehub.org/s/article/Growing-the-workforce-needed-for-building-retrofits-A-guide-for-US-cities?language=en_US (IRA "allocated $48 billion towards buildings").

[126] For example, the District of Columbia's Department of Energy and Environment has a Green Building Fund Grant Program launched in 2013, at https://doee.dc.gov/node/822142, and examples of recently funded grants can be found at *Green Building Fund Grant Program - Completed Grant Projects*, at https://doee.dc.gov/service/green-building-fund-grant-program-completed-grant-projects (last visited July 29, 2024).

[127] For example, *see Energy efficient commercial buildings deduction*, at https://www.irs.gov/credits-deductions/energy-efficient-commercial-buildings-deduction (last visited July 29, 2024); and Office of Energy Efficiency & Renewable Energy, *179D Energy Efficient Commercial Buildings*, at https://www.energy.gov/eere/buildings/179d-commercial-buildings-energy-efficiency-tax-deduction (last visited July 29, 2024).

[128] For more information on Energy Savings Performance Contracting and how it works, *see* Office of State and Community Energy Programs, *Energy Savings Performance Contracting*, at https://www.energy.gov/scep/slsc/energy-savings-performance-contracting (last visited July 29, 2024).

[129] *Sources available upon request.*

[130] IMT, *Utility Data Sensitivity* (2013), at https://imt.org/resources/utility-meter-data-sensitivity-matrix/ (last visited March 22, 2024) (graph available for download).

[131] *See* Energy Star's Utility Map, at https://www.energystar.gov/buildings/utility_map (last visited March 22, 2024). *See also* Energy Star's *Guidance for Utilities on Providing Whole-Building Energy Data to Enable Benchmarking in ENERGY STAR Portfolio Manager*, at https://www.energystar.gov/buildings/tools-and-resources/guidance-utilities-providing-whole-building-energy-data-enable (last visited March 22, 2024).

[132] H.631 was introduced in Vermont "relating to access to utility energy consumption data and establishment of an energy storage program." *See* H.631 (last recorded action on January 4, 2024), at https://legislature.vermont.gov/bill/status/2024/H.631 (last visited March 21, 2024) (proposed legislation can be accessed through the "Bill/Resolution Text" – "As Introduced" link).

[133] IMT's *Model Utility Data Access Law*, at https://imt.org/resources/model-utility-data-access-law/ (last visited March 22, 2024).

documented best practices for data-sharing, including a business case for customers and utilities and policy case for regulators.[134]

Another suggested issue has been a knowledge barrier or gap for how to achieve sustainability goals, such as implementing organic waste management and recycling programs.[135] This could create burdens on tenants to implement such programs, or landlords to develop and educate tenants on such programs.

Concerns of overcomplicating the leasing process also have been cited, which sometimes involve managing "dozens of leases with a wide range of lease structures under strict time constraints" and involves different operational and maintenance responsibilities.[136] Defining green lease terms, without established criteria, may pose a similar challenge.[137]

Additional challenges have been cited as lack of consideration of sustainable practices from the top, lack of communication between landlords and tenants around green building ideas, and lack of uniform or universal regulation, agreements, or set of rules among states.[138] Indeed, "[u]nlike residential leases, commercial leases are largely unregulated . . . ."[139]

Nonetheless, given certain state building codes and related net-zero goals, compliance may necessitate that landlords, tenants and other parties-in-interest overcome these challenges.

## IV. Overview of Model Provisions

The purpose of the model provisions is for states to assist commercial landlords, tenants, and other parties-in-interest to comply with state and city code requirements and energy efficiency goals in the commercial building sector through suggested model green lease provisions affecting large commercial buildings. The model provisions are predominantly based on templates created by industry leaders, including IMT's 2020 Green Lease Language Examples[140] and BOMA's 2018 Green Lease Guide,[141] to address issues affecting construction, design, operations, maintenance, energy reporting and other issues affecting green leases.[142] Provisions also were incorporated to

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[134] *See EPA, Utility Best Practices Guidance for Providing Business Customers with Energy Use and Cost Data* (November 2008), ES-2, at https://www.epa.gov/sites/default/files/2015-08/documents/utility_data_guidance.pdf (last visited March 22, 2024).

[135] *Source available upon request.*

[136] *Greening Leased Spaces: Opportunities and Challenges*, at 6-150, *supra* note 115 ("Since each lease structure results in a different balance of operational and maintenance responsibility between landlord and tenant, the issues of responsibilities for investments and operating costs have to be resolved differently for each type of lease.").

[137] *Id.*

[138] *A Review of Carbon Footprint Reduction in Construction Industry, from Design to Operation*, *supra* note 5 (citing a study conducted in Hong Kong and Singapore finding that "lack of awareness, education, incentives, and high initial costs are the obstacles to such a move"); *Accelerating the Green Movement: Major Barriers to Sustainable Construction*, *supra* note 59 (citing a number of these barriers); *Greening Leased Spaces: Opportunities and Challenges*, at 6-150, *supra* note 115 (addressing the communication issue between landlords and tenants).

[139] *High-Performance Leases: A Solution for Reducing Carbon Emissions in Commercial Buildings*, at 90, *supra* note 7.

[140] *Green Lease Language Examples*, *supra* n. 17.

[141] BOMA's updated 2018 Green Lease Guide can be accessed at https://www.boma.org/GreenLeaseGuide (last visited February 9, 2024).

[142] Citations to each provision, with reference points, are included in the associated model legislation.

promote environmental justice through measures designed to improve occupant health and wellbeing and reduce energy costs, "which are highest for those with the least means to pay these bills."[143]

Significant clauses include: (1) pass-through clauses for "green" capital improvements, (2) energy reporting, data sharing, and green building code clauses to comply with state requirements;[144] (3) operational clauses, including use of utilities; (4) use and purchase of sustainable products and materials for common-area spaces, tenant buildouts, and furniture, fixtures, and equipment; and (5) provisions promoting environmental justice to promote the health and well-being of occupants and energy saving measures.[145]

Heightened consideration was given to a proposed pass-through clause to determine allocation of responsibility for capital improvement costs for energy efficiency and construction and build-outs, with a sample illustration provided. An 80-20 cost allocation was used to provide financial incentives to both the landlord and tenant. In addition, provisions were incorporated to address metering, data sharing, and compliance with building regulations and laws that require GHG reporting, or reductions to embodied carbon. In those provisions language was incorporated to address situations, and possible recourse by the landlord, where a tenant may be reluctant to share data and information for privacy or other reasons.

The model legislation also includes provisions to address building and tenant space operations and utilities, and prevent the situation that arose as a result of the COVID-19 pandemic when building occupancy fell to historic lows in 2020 but "building energy use dropped by just 10% to 20%."[146] Additional provisions are offered for HVAC to be provided in accordance with environmental standards, compliance with landlord sustainability practices (discussed below), and meeting building-wide energy use reduction goals.

As an Exhibit A to the model provisions, example "Landlord Sustainability Practices" are itemized, and incorporated by reference in certain model provisions, to assist a landlord in

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[143] IMT, *Green Leases Go Platinum for Social and Environmental Impact*, at https://www.imt.org/news/green-leases-go-platinum-for-social-and-environmental-impact/; JLL, *The scope of green leases is expanding beyond the environment, Sustainability leaders are planning to incorporate social impact clauses in green leases* (October 13, 2022), at https://www.us.jll.com/en/trends-and-insights/cities/the-scope-of-green-leases-is-expanding-beyond-the-environment (clauses include commitment to diversity and inclusive design, health and wellbeing, support economic development, and community building/engaging local communities).

[144] A Better City, *Green Leasing An Effective Tenant/Landlord Strategy for Energy Efficiency* (December 2014), at https://www.abettercity.org/docs/abc-rpt%20green%20leasing%2012%2014.pdf?utm_source=New+ABC+Report%3A+Green+Leasing+12%2F14&utm_campaign=New+ABC+Report%3A+Green+Leasing+1.9.15&utm_medium=email (providing a green leasing primer, including pass-through clauses, operational clauses, sustainable purchasing clauses, and reporting clauses, focusing on Boston) (last visited February 20, 2024).

[145] On April 21, 2023, President Biden signed an executive order for federal agencies to lead by example on environmental justice initiatives, directing "federal agencies to address inequities in environmental hazards through community engagement, interagency coordination, advancement in science, data, and research, and more." *Fact Sheet: President Biden Signs Executive Order to Revitalize Our Nation's Commitment to Environmental Justice for All* (April 21, 2023), at https://www.climate.gov/news-features/feed/earth-day-executive-order-environmental-justice#:~:text=On%20April%2021%2C%202023%2C%20President,%2C%20and%20research%2C%20and%20more (last visited February 20, 2024).

[146] *See* September 2020 Johnson Controls and citations *supra* n. 7.

determining any practices that it may seek to implement. The Landlord Sustainability Practices include fifteen (15) practices, with subsections, that a landlord may seek to incorporate, including establishment of a building-wide recycling infrastructure, purchase or use of appliances, supplies, materials, FF&E, and carpeting from environmentally-certified sources, such as Energy STAR, recycled products, or other energy saving materials, low flow or EPA WaterSense plumbing fixtures, and other energy efficient measures set forth therein. Those practices also include requiring a tenant to unplug all non-essential equipment from outlets if the premises remain unoccupied for a certain amount of time to address excessive plug load issues mentioned herein, and providing sensor or timer controls for major office equipment. Further potential practices are incorporated in Exhibit A.

Other model provisions include provisions on tenant improvement work, recycling & waste management, and maintenance and cleaning to facilitate compliance with building code requirements, landlord sustainability practices, and rating standards and certifications. Numerous provisions also are added for air quality, lighting, use of renewable energy including solar, parking and transportation, irrigation and landscaping, and net-zero requirements to address the well-being of the occupants and further measures for energy savings. In addition, provisions were made to address entitlement to carbon credits and assignment and subletting.

## V. Conclusion.

In sum, the time is right for states to consider legislative goals to assist landlords, tenants, and parties-in-interest in complying with state requirements and achieving net-zero through revisions or updates to lease language. With a wave of recent and anticipated environmental regulations, some of which may impose large penalties for non-compliance, building owners/landlords and other parties-in-interest will have the difficult task of assessing the impact on lease arrangements and terms. Providing recommended provisions as a starting point will provide the necessary guidance to impacted parties, while also furthering states' net-zero efforts. Despite some initial short-term burdens and challenges, reports suggest long-term gains for affected parties that ultimately are expected to negate upfront costs, create increased energy savings, and lead to more worker productivity.