LEGAL IMPEDIMENTS TO SUSTAINABLE ARCHITECTURE AND GREEN BUILDING DESIGN

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TABLE OF CONTENTS

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INTRODUCTION

As governments, businesses, and the global community embark on an effort to address climate change, it is imperative that the United States' legal, regulatory, and political systems foster the adoption of resource-efficient and low-carbon technologies, practices, and infrastructure. Paramount to these efforts is the incorporation of sustainable architecture and green building design. Buildings represent nearly forty percent of U.S. greenhouse gas (GHG) emissions.[1] Conventional buildings inefficiently use energy and water, require significant amounts of raw materials and natural resources for construction and operation, generate harmful indoor pollutants, and account for a substantial portion of other harmful environmental air pollutants.[2] While the initiative to transform the building sector is already underway, significant barriers impede its progress.

This Note examines particular legal impediments to the adoption and implementation of sustainable architecture and green building design. Part I describes sustainable architecture and green building design. Further, it discusses why sustainable architecture and green building techniques must be adopted in order to effectively address global climate change. Part II discusses the doctrine of federal preemption, how it has been applied by courts to preempt state and local building codes, and its implications for the development of progressive state and local green building regulations. Part III discusses the intellectual property rights associated with sustainable architecture and the ambiguity of its protection under current copyright law.

I. SUSTAINABLE ARCHITECTURE AND GREEN BUILDING DESIGN

A. Sustainable Architecture and Green Buildings Defined

Sustainable architecture and green building design are interchangeable terms used to refer to buildings that are constructed, operated, and

1. U.S. ENVTL. PROT. AGENCY, BUILDINGS AND THE ENVIRONMENT: A STATISTICAL SUMMARY 2 (2009), *available at* http://epa.gov/greenbuilding/pubs/gbstats.pdf (This figure includes the GHG emissions generated during the life cycle of a building and from the activities that occur within a building.).

2. THE LAW OF GREEN BUILDINGS, REGULATORY AND LEGAL ISSUES IN DESIGN, CONSTRUCTION, OPERATIONS, AND FINANCING 3, 5 (J. Cullen Howe & Michael B. Gerrard eds., 2010).

renovated in a resource-efficient and sustainable manner.[3] The U.S. Environmental Protection Agency (EPA) defines green building as "the practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's life-cycle from siting to design, construction, operation, maintenance, renovation and deconstruction."[4] Green building design seeks to use energy, water, and other resources efficiently; protect occupant health; and reduce waste, pollution, and environmental degradation.[5]

B. Why Buildings Matter: Conventional Building Impacts

Americans, on average, spend ninety percent of their time indoors.[6] Furthermore, the majority of buildings in which Americans work, sleep, and eat do not incorporate green building concepts.[7] Additionally, the long lifetime of buildings—the average nonresidential building exists for seventy-five years—implies that designs can have direct environmental and human health impacts for decades.[8] Conventional buildings require extensive amounts of raw materials for construction and operation, generate enormous waste streams and air pollutants, and use substantial quantities of water and land.[9] Additionally, buildings consume an immense amount of energy and are responsible for producing a significant amount of GHG emissions.

1. Environmental Impacts

Buildings have major environmental impacts. Buildings in the United States use an estimated thirty-nine billion gallons of water per day and account for ten percent of the nation's total water consumption.[10] Additionally, buildings and related infrastructure constitute approximately

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3. Sustainable, as first defined by the U.N. World Commission on Environment and Development, is development that "meet[s] the needs of the present without compromising the ability of future generations to meet their own needs." G.A. Res. 42/187, U.N. Doc. A/RES/42/187 (Dec. 11, 1987).

4. *Basic Information: Definition of Green Building*, U.S. ENVTL. PROT. AGENCY, http://www.epa.gov/greenbuilding/pubs/about.htm (last updated Dec. 19, 2012).

5. *Id.*

6. THE INSIDE STORY: A GUIDE TO INDOOR AIR QUALITY (Envtl. Prot. Agency ed., 2012).

7. THE LAW OF GREEN BUILDINGS, *supra* note 2, at 5.

8. ENVTL. AND ENERGY STUDY INST., ENERGY IN BUILDINGS 1 (2006), *available at* http://www.eesi.org/files/eesi_buildings_energy_091106.pdf.

9. THE LAW OF GREEN BUILDINGS, *supra* note 2, at 5–11.

10. *See* U.S. DEP'T. OF ENERGY, BUILDING ENERGY DATA BOOK, Table 8.1.1 (2008), *available at* http://buildingsdatabook.eere.energy.gov/docs/xls_pdf/8.1.1.pdf.

107 million acres of developed land.[11] In addition to the direct land impacts of a physical building space, buildings also require roads, sewer lines, utility poles, parking garages, and other infrastructure for service and maintenance.[12] Thus, poorly sited buildings and urban sprawl result in an inefficient use of land and increased habitat disruption and fragmentation.[13] Furthermore, buildings require vast amounts of raw materials and natural resources for their construction and operation.[14] Buildings account for forty percent of all raw materials used in the United States.[15] Moreover, much of these materials are wasted during the construction and demolition (C&D) of buildings. Building-related C&D generates approximately 160 million tons of waste per year, totaling nearly twenty-six percent of non-industrial waste generation in the United States.[16] Wastes include lumber, manufactured wood, roofing materials, metals, plaster, plastics, foam, insulation, textiles, glass, and packaging.[17]

Additionally, there are many human health effects associated with buildings. Buildings contribute to cancer-related illnesses and asthma caused by indoor contaminants such as dust mites, molds, insects, secondhand smoke, and household chemicals.[18]

2. Energy Use Impacts

Buildings use energy to heat, ventilate, cool, light, and power the activities within their walls. According to the United Nations Environmental Programme (UNEP), buildings use thirty to forty percent of all primary energy produced worldwide.[19] In the United States specifically, residential and commercial buildings consume over fifty percent of all energy consumed in the U.S. and seventy-three percent of generated

11. J. CULLEN HOWE, THE LAW OF GREEN BUILDINGS 9 (2012), *available at* http://apps.americanbar.org/abastore/products/books/abstracts/5350191%20chapter%201_abs.pdf.

12. THE LAW OF GREEN BUILDINGS, *supra* note 2, at 9.

13. *Id.*

14. *Id.*

15. AUTODESK, INC., BUILDING INFORMATION MODELING FOR SUSTAINABLE DESIGN 1 (2005), *available at* http://images.autodesk.com/latin_am_main/files/bim_for_sustainable_design_jun05.pdf.

16. BUILDINGS AND THE ENVIRONMENT: A STATISTICAL SUMMARY, *supra* note 1, at 6.

17. THE LAW OF GREEN BUILDINGS, *supra* note 2, at 11 (citing Neb. Energy Office, *Construction Waste Minimization Methods*, *available at* http://www.neo.ne.gov/home_const/factsheets/const_waste_min.htm).

18. BUILDINGS AND THE ENVIRONMENT: A STATISTICAL SUMMARY, *supra* note 1, at 4–5.

19. U.N. ENVTL. PROGRAMME DIV. OF TECH., INDUS. AND ECON., BUILDINGS AND CLIMATE CHANGE: STATUS, CHALLENGES AND OPPORTUNITIES 4 (2007), *available at* http://www.unep.fr/shared/publications/pdf/DTIx0916xPA-BuildingsClimate.pdf.

electricity.[20] Energy consumption in buildings costs over 390 billion dollars per year.[21] Globally, existing buildings account for forty percent of the world's energy consumption.[22] Projections of future energy consumption reveal that energy use in the United States is expected to increase by approximately nineteen percent by 2025.[23] Furthermore, not only do buildings account for a major proportion of the total energy and electricity consumed in the United States, but they also typically use energy inefficiently. One estimate suggests that if the United States could capture its full efficiency potential by 2020, it would consume twenty-three percent less energy per year, resulting in over 9.1 quadrillion British thermal units (BTUs) in savings.[24]

3. GHG Emissions and Climate Change

As a result of their energy consumption, buildings also account for a significant portion of total GHG emissions. Burning fossil fuels results in the release of carbon dioxide (CO_2), a heat-trapping GHG, into the atmosphere.[25] Since the United States is heavily dependent on fossil fuels for electricity generation, the combustion of these fossil fuels—such as petroleum, natural gas, and coal—produces immense GHG emissions. Approximately sixty-eight percent of the United States' electricity is generated by fossil fuels.[26] Accordingly, buildings in the United States account for forty percent of the nation's total GHG emissions and twenty-four percent of global CO_2 emissions.[27] With the exception of China, U.S. buildings are responsible for more GHG emissions than any other country's

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20. U.S. ENERGY INFO. ADMIN., ANNUAL ENERGY OUTLOOK 2009 3, 9–12, 36 (2008), *available at* http://www.eia.doe.gov/oiaf/aeo/aeoref_tab.html; *Buildings Energy Data Book: 1.1 Buildings Sector Energy Consumption*, U.S. DEP'T OF ENERGY, http://buildingsdatabook.eere.energy.gov/TableView.aspx?table+1.1.1 (last updated Mar. 2012).

21. *See* D&R INT'L LTD., U.S. DEP'T OF ENERGY, 2008 BUILDINGS ENERGY DATA BOOK 1-1, 1-2, 1–20 (2009) (discussing residential sector, commercial sector, and buildings sector energy consumption).

22. INT'L ENERGY AGENCY, PROMOTING ENERGY EFFICIENCY INVESTMENTS: CASE STUDIES IN THE RESIDENTIAL SECTOR 5 (2008) [hereinafter CASE STUDIES IN THE RESIDENTIAL SECTOR].

23. U.S. ENERGY INFO. ADMIN., ANNUAL ENERGY OUTLOOK 2008, at 6 (2008), *available at* http://www.eia.gov/forecasts/archive/aeo08/pdf/0383(2008).pdf.

24. MCKINSEY GLOBAL ENERGY AND MATERIALS, UNLOCKING ENERGY EFFICIENCY IN THE U.S. ECONOMY 7 (2009), *available at* http://www.mckinsey.com/Client_Service/Electric_power_and_Natural_Gas/Latest_thinking/Unlocking_energy_efficiency_in_the_US_economy.aspx (follow "Read executive summary").

25. *Overview of Greenhouse Gases*, U.S. ENVTL. PROT. AGENCY, http://www.epa.gov/climatechange/ghgemissions/gases/co2.html (last updated Apr. 22, 2013).

26. *See* ELECTRIC POWER RESEARCH INSTITUTE, PRISM/MERGE ANALYSES 2009 UPDATE 6 (2009) (presenting estimates of future electricity sources for the United States based on current usage).

27. BUILDINGS AND THE ENVIRONMENT: A STATISTICAL SUMMARY, *supra* note 1, at 2; CASE STUDIES IN THE RESIDENTIAL SECTOR, *supra* note 22.

total anthropogenic GHG emissions.[28] In fact, according to the U.S. Department of Energy's (DOE) 2006 estimations, emissions from U.S. buildings were approximately equal to the total combined emissions of the United Kingdom, France, and Japan.[29]

C. Benefits of Sustainable and Green Building Practices

1. Environmental and Human Health Benefits

Green building practices seek to minimize the land, energy, water, and resource-intensity of buildings by designing structures that use resources more efficiently, improve indoor air quality, and result in an overall smaller environmental impact. Green buildings provide environmental, human health, and financial benefits. On average, green buildings are twenty-five to thirty percent more energy efficient.[30] Improving building energy efficiency could provide for up to eighty-five percent of future energy demand.[31] Additionally, almost a quarter of all the emission reductions necessary to prevent devastating climate change impacts could come from employing energy efficiency measures in buildings.[32] Furthermore, green buildings offer a thirty percent reduction in energy use, thirty to fifty percent in water savings, a thirty-five percent reduction in carbon emissions, and a fifty to ninety percent reduction in building construction and operation waste.[33]

Green buildings reduce land use impacts by selecting and developing environmentally sustainable sites. Green building site development includes measures such as selecting locations where an urban infrastructure already exists, minimizing parking and discouraging excessive automobile use, managing stormwater to reduce stormwater runoff, and managing landscaping and parking lots to reduce excessive open pavement and heat

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28. BRUCE R. KINZEY ET AL., THE FEDERAL BUILDINGS RESEARCH AND DEVELOPMENT PROGRAM: A SHARP TOOL FOR CLIMATE POLICY, Sec. 9.220 (American Council for an Energy-Efficient Economy ed., 2002).

29. U.S. DEP'T OF ENERGY, ENERGY EFFICIENCY TRENDS IN RESIDENTIAL AND COMMERCIAL BUILDINGS 11 (2008), *available at* http://apps1.eere.energy.gov/buildings/publications/pdfs/corporate/bt_stateindustry.pdf.

30. GREGORY H. KATS, GREEN BUILDING COSTS AND FINANCIAL BENEFITS 4 (2003), *available at* http://www.bouldercolorado.gov/files/commercial_green_building_costs_and_benefits - kats_2003.pdf.

31. *About USGBC*, U.S. GREEN BUILDING COUNCIL, http://www.usgbc.org/DisplayPage.aspx?CMSPageID=124 (last visited Mar. 28, 2013).

32. LAWRENCE L. OSTEMA, GREEN BUILDING AND SUSTAINABLE DEVELOPMENT, THE PRACTICAL LEGAL GUIDE 13, 43 n.21 (Jonathan E. Furr et al. eds., 2009).

33. JERRY YUDELSON, THE GREEN BUILDING REVOLUTION 8, 217 n.10 (2008).

generation.[34] Green buildings also improve water use through native landscaping, moderating water used for landscaping, and using water-conserving fixtures inside the building.[35]

Green buildings also promote healthier indoor environments. They emit less indoor pollutants through better siting, operate better building material source controls, use improved lighting quality, employ daylight harvesting and natural shading, improve thermal comfort, and make use of enhanced ventilation, heating, and air conditioning systems.[36]

2. Financial Benefits of Sustainable and Green Building Practices

Sustainable building practices not only have environmental and human health benefits, but financial benefits as well. Although green buildings are typically perceived as more expensive than conventional buildings, analyses of green buildings compared to conventional designs demonstrate that the average premium of a green building is slightly less than two percent, or three to five dollars per square foot.[37] Financial benefits of green buildings result from energy and water savings, reduced waste, improved indoor air quality, greater employee productivity, reduced employee health costs, and lower operation and maintenance costs.[38] An upfront investment of about two percent of construction costs usually yields a life cycle savings of over ten times the initial investment.[39] Green buildings also increase the property value of a building. For example, American homebuyers are willing to pay eleven to twenty-five percent more for a green home than they would for a conventional home.[40] Furthermore, a national effort to implement green building practices could generate 2.5 million American jobs.[41]

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34. JERRY YUDELSON, GREEN BUILDING A TO Z, UNDERSTANDING THE LANGUAGE OF GREEN BUILDING 16 (2007).

35. *Id.*

36. KATS, *supra* note 30, at 5.

37. *Id.* at 3.

38. *Id.*

39. GREG KATS, THE COST AND FINANCIAL BENEFITS OF GREEN BUILDINGS: A REPORT TO CALIFORNIA'S SUSTAINABLE BUILDING TASK FORCE, at v (2003), *available at* http://www.usgbc.org/Docs/News/News477.pdf.

40. *Eco-Rate*, GREEN BUILDING STATISTICS, www.ecorate.com/40/Green_Building_Statistics (last visited Mar. 25, 2013).

41. *About USGBC*, *supra* note 31.

D. Green Building Rating Guidelines

The most established and widely used green building rating system is the United States Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) System.[42] The USGBC developed the LEED system to provide a national standard and rating system for green buildings.[43] LEED is a voluntary, points-based rating system that allocates points by measuring a building's performance based on its design, construction, operation, and maintenance.[44] LEED was designed to comprehensively evaluate and address a building's ecological footprint throughout its lifecycle.[45] LEED has created different rating systems for different types of buildings, including new construction, speculative buildings, commercial interior, existing buildings, homes, schools, and neighborhood developments.[46] LEED is an internationally recognized rating system and serves as the benchmark for green building rating and certification standards.[47] Several states and local governments have adopted LEED standards into their local building codes.[48] California, Washington, and Connecticut require that all state buildings meet LEED criteria.[49] Additionally, forty-five states, as well as various school districts and universities, have adopted LEED-based initiatives through legislation, executive orders, resolutions, ordinances, policies, and incentives.[50]

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42. THE LAW OF GREEN BUILDINGS, *supra* note 2, at 25.

43. U.S. GREEN BUILDING COUNCIL, LEED: GREEN BUILDING RATING SYSTEM FOR NEW CONSTRUCTION & MAJOR RENOVATIONS, at i (Mar. 14, 2004), *available at* http://www.usgbc.org/Docs/LEEDdocs/LEED_RS_v2-1.pdf.

44. THE LAW OF GREEN BUILDINGS, *supra* note 2, at 17.

45. *Id.*

46. YUDELSON, *supra* note 34, at 13; *see also* THE LAW OF GREEN BUILDINGS, *supra* note 2, at 18–19.

47. *About USGBC*, *supra* note 31.

48. Alexandra B. Klass, *State Standards for Nationwide Products Revisited: Federalism, Green Building Codes, and Appliance Efficiency Standards*, 34 HARV. ENVTL. L. REV. 335, 343–44 (2010); *see also* U.S. GREEN BUILDING COUNCIL, LEED PUBLIC POLICIES 1 (2010) [hereinafter LEED PUBLIC POLICIES], *available at* http://usgbc.org/ShowFile.aspx?DocumentID=691(detailing federal, state, and municipal utilization of LEED building standards).

49. LEED PUBLIC POLICIES, *supra* note 48, at 7–8, 18.

50. Klass, *supra* note 48, at 344.

II. FEDERAL PREEMPTION OF STATE AND LOCAL BUILDING CODES

A. State and Local Building Codes

The direct regulation of land use has traditionally fallen within the scope of the state's inherent police powers.[51] Although states have enacted legislation and regulations developing the basic structure of local land use, states have historically delegated the majority of their authority to local governments.[52] With this constitutional and state-delegated authority, state and local governments have enacted various forms of green building initiatives. [53] Additionally, several cities, counties, towns, and state governments have incorporated USGBC's LEED standards into local policy.[54]

At the local level, governments use their zoning authority to promote green building development. Local green building legislation is generally enacted as either: (1) green building mandates for public construction projects; (2) incentives for private construction developers; or (3) mandates applicable to both public and private projects.[55]

At the state level, authorities employ various mechanisms to implement green building initiatives. Since green buildings encompass such a vast array of issues—relating to energy efficiency, renewable energy, water efficiency, air quality, construction materials and waste, location and siting, and building life cycle—state initiatives vary significantly based on their particular objective. [56] Typically, state initiatives include mandates, recommendations, financial incentives, temporary programs, or technology-specific laws or regulations.[57] Interestingly, as states have made a more concerted effort to address climate change they have begun to override

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51. *See* Euclid v. Ambler Realty Co., 272 U.S. 365, 389 (1926) (finding that a city could use its police power to implement a comprehensive land use plan for the community).

52. *See* Klass, *supra* note 48, at 341; *see also* Jerold Kayden, *National Land-Use Planning in America: Something Whose Time Has Never Come*, 3 WASH. U. J.L. & POL'Y 446, 449 (2000) (discussing the power local governments hold in land-use planning policies in United States).

53. AMERICAN INSTITUTE OF ARCHITECTS, LOCAL LEADERS IN SUSTAINABILITY, GREEN BUILDING INCENTIVE TRENDS 2 (2012), *available at* http://aia.org/aiaucmp/groups/aia/documents/pdf/aiab093472.pdf.

54. U.S. GREEN BUILDING COUNCIL, LEADERSHIP WITH LEED (2012), *available at* http://www.usgbc.org/Docs/Archive/General/Docs10853.pdf. The U.S. Green Building Council reports that as of May 4, 2012, 442 localities have incorporated various LEED initiatives. *Id.* The entities include 384 cities and towns, fifty-eight counties across forty-five states, thirty-four state governments, fourteen federal agencies or departments, and numerous public school districts and institutions of higher education. *Id.*

55. THE LAW OF GREEN BUILDINGS, *supra* note 2, at 83.

56. *Id.* at 72.

57. *Id.* at 71.

local laws that interfere with the state's policies and goals for green development.[58] Similarly, the federal government has also recently asserted some control over land use regulations in its effort to address climate change and promote renewable energy technologies.[59]

B. Doctrine of Federal Preemption

Under Article VI, Clause 2 of the United States Constitution, federal law is decreed as "the supreme law of the land."[60] Accordingly, when a federal law conflicts with a state law, federal law "preempts" state law.[61] To determine whether a state law is expressly or impliedly preempted, a court must examine Congress's intent in enacting the federal statute—'"[t]he purpose of Congress is the ultimate touchstone' in every preemption case."[62] Congress's intention to preempt a field can be evinced "through a statute's express language or through its structure and purpose."[63] If Congress's intent to preempt is not expressly contained in a statute's language, structure, or purpose, preemption can "be inferred if the scope of the statute indicates that Congress intended federal law to occupy the legislative field, or if there is an actual conflict between state and federal law."[64] Therefore, the federal government can preempt state action through express preemption, implied "field" preemption, or implied "conflict" preemption.[65]

The doctrine of federal preemption includes a presumption against preemption. Federal preemption questions must recognize "the assumption that the historic police powers of the States [are] not to be superseded by the Federal Act unless there was a clear and manifest purpose of Congress."[66] The doctrine of federal preemption is often viewed as a favorable doctrine. Not only does it create national uniformity, but it also establishes standards to safeguard individual liberties and advances social

58. *See* Klass, *supra* note 48, at 342.

59. *See* American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. § 209 (2009) (preempting private or local governments from restricting residential installation of solar energy systems).

60. U.S. CONST. art. VI, cl. 2.

61. Maryland v. Louisiana, 451 U.S. 725, 746 (1981); Altria Group, Inc. v. Good, 555 U.S. 70, 76 (2008).

62. Medtronic, Inc. v. Lohr, 518 U.S. 470, 485 (1996) (quoting Retail Clerks v. Schermerhorn, 375 U.S. 96, 103 (1963)).

63. *Altria*, 555 U.S. at 76 (citing Jones v. Rath Packing Co., 430 U.S. 519, 525 (1977)).

64. *Id.* at 76–77 (citing Freightliner Corp. v. Myrick, 514 U.S. 280, 287 (1995)).

65. *Id.* at 76; Freightliner Corp. v. Myrick, 514 U.S. 280, 287 (1995).

66. Rice v. Santa Fe Elevator Corp., 331 U.S. 218, 230 (1947).

and political goals.[67] Federal preemption, however, can also have adverse effects, particularly in regard to hindering progressive state policies. As Justice Brandeis said, "[i]t is one of the happy incidents of the federal system that a single courageous state may, if its citizens choose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country."[68] Accordingly, federal preemption has the potential to suppress the states' role in experimenting and developing innovative public policies.

C. Federal Regulation—Energy Policy and Conservation Act

In 1975, Congress enacted the Energy Policy Conservation Act (EPCA).[69] As a result of the oil embargo and pressing concerns of American dependence on foreign energy resources, Congress sought to enact legislation to promote domestic energy conservation.[70] Specifically, EPCA was designed to reduce the nation's "domestic energy consumption through the operation of specific voluntary and mandatory energy conservation programs."[71] As originally enacted, EPCA required manufacturers to label appliances and required the Secretary of the Federal Energy Administration to implement energy efficiency standards if the labeling program was ineffective.[72] EPCA preempted state regulations if they were anything other than the applicable federal rules for testing and labeling.[73] However, EPCA did not preempt state regulations that differed from federal regulations if they were justified by a state or local need, did not interfere with interstate commerce, and were more stringent than the federal standard.[74]

In 1978, Congress enacted the National Energy Conservation Policy Act (NECPA), which amended EPCA insofar as only allowing states to prescribe their own regulations if they were more stringent than federal standards, or if the Secretary found that a state had a significant state or

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67. Memorandum from the White House Office of the Press Sec'y for the Heads of Exec. Dep'ts and Agencies (May 20, 2009), *available at* www.whitehouse.gov/the-press-office/presidential-memorandum-regarding-preemption.

68. New State Ice Co. v. Liebmann, 285 U.S. 262, 386–87 (1932) (Brandeis, L., dissenting).

69. 42 U.S.C. §§ 6201–6422 (2006).

70. Air Conditioning and Refrigeration Inst. v. Energy Res. Conservation and Dev. Comm'n, 410 F.3d 498, 498 (9th Cir. 2005) (describing the legislative history of the Energy Policy and Conservation Act).

71. S. REP. NO. 94-516, at 117 (1975), *reprinted in* 1975 U.S.C.C.A.N. 1956, 1957.

72. H. REP. NO. 94-340, at 99 (1975), *reprinted in* 1975 U.S.C.C.A.N. 1762, 1857.

73. Pub. Law No. 94-163, § 327(a), 89 Stat. at 927 (codified as amended at 42 USC § 6297(1975)).

74. *Id.* § 327(b).

local interest justifying its regulations and the regulations would not unduly burden interstate commerce.[75] NECPA also created a national conservation program for appliances and required the Department of Energy (DOE) to prescribe minimum energy efficiency standards for regulated products.[76] After determining that establishing minimum energy efficiency standards would not result in significant energy conservation or justify the economic costs, the DOE adopted a "no-standard standard," which allowed states to request waivers from preemption.[77] Consequently, separate state appliance standards began to emerge.[78] When challenged, the D.C. Circuit Court of Appeals "held that the DOE erroneously concluded that 'nostandard' standards was appropriate and instructed the DOE to adopt federal efficiency standards."[79]

Congress further amended EPCA in the National Appliance Energy Conservation Act (NAECA) of 1987, which established federal energy efficiency standards for residential appliances.[80] NAECA also amended NECPA's preemption provisions, making preemption much broader than it previously had been.[81] NAECA provided that states could no longer adopt energy efficiency standards that were identical to the federal standards, made it more difficult for states to obtain waivers of preemption for more stringent state efficiency standards, and required that states established by a preponderance of the evidence that state regulation was justified by unusual or compelling state or local interests to obtain a waiver of preemption.[82] EPCA was subsequently amended in the Energy Policy Act (EPACT) of 1992 to expand the federal appliance program to include energy efficiency standards for commercial and industrial appliances.[83] EPACT also generally incorporated the preemption provisions established by NAECA.[84]

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75. National Energy Conservation Policy Act of 1978, Pub. L. No. 95–619, § 424(a), 92 Stat. 3206, 3264 (codified as amended at 42 U.S.C. § 6297(b)(1978)).

76. *See* H.R. REP. NO. 95-1751, at 114–115 (1978) (Conf. Rep.).

77. H.R. REP. NO. 100-11, at 27 (1987).

78. S. REP. NO. 100-6, at 4 (1987).

79. Air Conditioning and Refrigeration Inst. v. Energy Res. Conservation and Dev. Comm'n, 410 F.3d 498, 499 (9th Cir. 2005) (citing Natural Res. Def. Council v. Herrington, 768 F.2d 1355, 1433 (D.C. Cir. 1985)).

80. 42 U.S.C. §§ 6291–6309 (2006).

81. *Id.* § 6297(c) (2006).

82. *Id.* § 6297 (2006); *see also Air Conditioning*, 410 F.3d at 500 (stating that the rationale for stricter preemption standards was to "counteract the systems of separate state appliance standards that had emerged as a result of the DOE's 'general policy of granting petitions form States requesting waivers from preemption,' which caused appliance manufacturers to be confronted with 'a growing patchwork of differing State regulations which would increasingly complicate their design, production and marketing plans'").

83. 42 U.S.C. §§ 6295(a), 6313.

84. *Id.* § 6316(a)–(b).

Thus, as amended EPCA's express preemption clause prohibits any "[s]tate regulation concerning the energy efficiency, energy use, or water use" of a "covered product."[85] Under the statute, "covered product" includes refrigerators, air conditioners, central air conditioners and heat pumps, water heaters, pool heaters, furnaces and boilers, dishwashers, clothes washers, clothes dryers, florescent lamp ballasts, kitchen ranges and ovens, lamps, showerheads, and faucets.[86]

D. State and Local Laws Preempted by Federal Law in the Courts

Two recent district court cases have demonstrated the courts' positions on the scope of federal preemption of energy efficiency appliance standards.[87] In *Air Conditioning, Heating and Refrigeration Institute (ACHI) v. City of Albuquerque* and in *Building Industries Association of Washington (BIAW) v. Washington State Building Code Council*, the United States District Courts for the District of New Mexico and Western District of Washington, respectively, examined whether local building codes were preempted by the federal energy efficiency appliance standards promulgated under EPCA.

In *ACHI v. City of Albuquerque*, local and regional distributors of heating, ventilation, air conditioning, and heating products, along with the trade associations that represented these products, challenged the City of Albuquerque's ordinance that imposed minimum energy efficiency standards, asserting it was preempted by EPCA.[88] The challenged ordinance, which was promulgated as part of an initiative to "significantly reduce carbon dioxide and green house gas emissions," established a set of performance- and prescriptive-based options to achieve greater energy efficiency in buildings.[89] The court determined that the ordinance presented a question of express preemption.[90] Accordingly, the court began its analysis with the interpretation of the federal statutory provision alleged to

85. *Id.* § 6297.

86. *Id.* §§ 6295(b)–(j).

87. *See* Air Conditioning, Heating and Refrigeration Inst. v. City of Albuquerque, No. 08–633 MV/RLP, 2008 WL 5586316 at *1 (D. N.M. Oct. 3, 2008), *aff'd*, 835 F. Supp. 2d 1133 (D. N.M. 2010) (holding that certain provisions of Albuquerque's energy conservation code were preempted by federal law); Bldg. Indus. Ass'n of Wash. v. Wash. State Bldg. Code Council, No. 3:10-cv-05373-RJB, 2011 WL 485895, at *1 (W.D. Wash. Feb. 7, 2011), *aff'd*, 683 F.3d 1144 (9th Cir. 2012) (holding that certain amendments to Washington's State Energy Code were not preempted by EPCA).

88. *City of Albuquerque*, 2008 WL 5586316, at *1.

89. *Id.* at *2.

90. *Id.* at *6.

preempt the city law.[91] Additionally, examining the legislative history of EPCA, the court stated that:

> The legislative history makes it clear that the purpose behind § 6297's broad preemption provision was to eliminate the systems of separate state appliance standards that had emerged as a result of the DOE's 'general policy of granting petitions from States requesting waivers from preemption,' that caused appliance manufacturers to be confronted with 'a growing patchwork of differing State regulations which would increasingly complicate their design, production and marketing plans.'[92]

Accordingly, although noting the "laudable" goals to improve energy efficiency in the building industry, the district court held that the city ordinance was expressly preempted by "the long-standing federal statutes governing the energy efficiency of certain" products.[93]

In *Building Industries Association of Washington (BIAW) v. Washington State Building Code Council*, the district court for the Western District of Washington was asked to determine whether certain amendments to Washington's State Energy Code were preempted by EPCA.[94] In passing the amendments to Washington's building energy code, the legislature noted that:

> [E]nergy efficiency is the cheapest, quickest, and cleanest way to meet rising energy needs, confront climate change, and boost [Washington's] economy. More than thirty percent of Washington's greenhouse gas emissions come from energy use in buildings. Making homes, businesses, and public institutions more energy efficient will save money, create good local jobs, enhance energy security, reduce pollution that causes global warming, and speed economic recovery while reducing the need to invest in costly new generation. Washington can spur its economy and assert its regional and national clean energy leadership by putting efficiency first. Washington can accomplish this by: Promoting super efficient, low-energy use building codes; requiring disclosure of buildings'

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91. *Id.* (citing Medtronic, Inc. v. Lohr, 518 U.S. 470, 484–85 (1996) ("The purpose of Congress is the ultimate touchstone in every preemption case.")).

92. *Id.* at *7 (citing S. REP. NO. 100-6, at 4).

93. *Id.* at *12.

94. Bldg. Indus. Ass'n of Wash. v. Wash. State Bldg. Code Council, No. 3:10-cv-05373-RJB, 2011 WL 485895, at *1 (W.D. Wash. Feb. 7, 2011), *aff'd*, 683 F.3d 1144 (9th Cir. 2012).

> energy use to prospective buyers; making public buildings models of energy efficiency; financing energy saving upgrades to existing buildings; and reducing utility bills for low-income households.[95]

In 2006, the Washington Building Code established minimum requirements for the design of new residential buildings by regulating their exterior envelopes, HVAC selections, water heating systems, and efficient use and conservation of energy.[96] Building on the requirements of the 2006 Code, the 2009 amendments required a fifteen percent reduction in annual net energy consumption in all newly constructed buildings.[97] Similar to the court's analysis in *ACHI*, the court determined the case was a question of express preemption. However, unlike *ACHI*, this case implicated one of EPCA's preemption clause exceptions. Under EPCA, "a regulation or other requirement contained in a State or local building code for new construction concerning the energy efficiency or energy use of such covered product is not superseded" if it complies with seven enumerated requirements.[98] Finding that the Washington regulations fit within the exception to EPCA's preemption clause, the district court granted summary judgment to the State.[99] On appeal, the Ninth Circuit affirmed the district court's holding, finding that the "Washington Building Code satisfie[d] the conditions Congress set forth in EPCA for exemption from federal preemption."[100]

Although the courts ultimately reached different holdings, these cases illustrate the concern and strength of EPCA's preemption provision. While exceptions to preemption exist, the requisites for exemption are stringent. Thus, it is probable that many state and local actions, which are often more aggressive in seeking improvements in energy efficiency and building codes, will be impeded by EPCA's broad preemption provision.

E. Why Does Federal Preemption of State and Local Building Codes Matter?

The federal preemption of state and local building codes has considerable implications on the scope of state and local authority to

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95. *Id.* at *2 (citing RCW 19.27A.130).
96. WASH. ADMIN. CODE § 51-11-101.3 (2006).
97. WASH. ADMIN. CODE § 51-11 (2009).
98. 42 U.S.C. § 6297(f)(3)(A)–(G) (2006).
99. *Bldg. Indus. Ass'n of Wash.*, 2011 WL 485895, at *8 (stating that under EPCA, there was an exception to preemption which provided that "'a regulation or other requirement contained in a State or local building code for new construction concerning the energy efficiency of energy use of such covered product is not superseded'" if it complies with the statute's subsequent requirements).
100. Bldg. Indus. Ass'n of Wash. v. Wash. State Bldg. Code Council, 683 F.3d 1144, 1155 (9th Cir. 2012).

regulate building code standards. Consequently, such preemption also has a substantial effect on the environmental impacts of American buildings and their role as a major contributor to global climate change. As noted previously, buildings account for over forty percent of U.S. energy consumption, seventy-three percent of electricity consumption, and are responsible for approximately forty percent of U.S. greenhouse gas emissions. Appliances within buildings, including heating and cooling systems, washing machines and dryers, and refrigerators, account for seventy percent of a building's total greenhouse gas emissions. [101] Therefore, improvements in appliance energy efficiency would result in significant reductions in greenhouse gas emissions. Furthermore, because these reductions are technologically and economically feasible—the so-called "low-hanging fruit" of efficiency measures—the opportunity to regulate and facilitate their adoption is even more pressing.[102]

The federal government's express preemption of energy efficiency appliance standards inhibits state and local initiatives from achieving maximum energy efficiency in residential, industrial, and commercial buildings. Since appliances constitute such a significant portion of a building's energy use, and therefore its greenhouse gas emissions, preemption undermines state and local efforts to actualize energy savings through building codes. Additionally, states have traditionally served as laboratories for experimental policies. Preventing states from enacting energy efficiency standards could thwart policy innovations and inhibit the ultimate adoption of successful policy by the federal government. [103] Consequently, whereas federal preemption is often viewed as a positive force to advance social policy, in this narrow context of standards for appliance energy efficiency, federal preemption impedes the advancement of greater energy efficiency standards.

Although the legislative purpose of the preempting legislation was to reduce "domestic energy consumption through the operation of specific voluntary and mandatory energy conservation programs," [104] the Act's express preemption provisions have a seemingly contradictory effect. In

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101. Klass, *supra* note 48, at 340–41. The total GHG emissions resulting from appliances pertain to the emissions from the electricity generation needed to power the appliances within the building. These emissions, although technically emitted at generation facilities miles away, can be attributed to the appliances because of the appliances' demand for electricity generation, which results in GHG emissions.

102. MCKINSEY & CO., REDUCING U.S. GREENHOUSE GAS EMISSIONS 34 (2007), *available at* http://www.mckinsey.com/client_service/sustainability/latest_thinking/reducing_us_greenhouse_gas_emissions (follow "Read the full report").

103. CHRIS WOLD, DAVID HUNTER & MELISSA POWERS, CLIMATE CHANGE AND THE LAW 871 (2009).

104. S. REP. NO. 94-516, at 117 (1975) (Conf. Rep.), *reprinted in* 1975 U.S.C.C.A.N. 1956, 1957.

order to achieve Congress's goals, EPCA must be revisited to account for the advantages of state and local legislative initiatives and enact legislation which both furthers green building development, while maintaining minimum federal standards. Congress's concern about inconsistent appliance standards will effectively pressure manufacturers to achieve the greatest efficiency rates in order to remain competitive in the market.

III. INTELLECTUAL PROPERTY RIGHTS AND SUSTAINABLE ARCHITECTURE

In addition to the federal preemption of energy efficiency standards, copyright protection for architectural building design presents another potential barrier to the widespread implementation of sustainable architecture in the United States. The design of a building not only determines the resources required for construction, the building's physical location, and its environmental and human health impacts, but it also dictates the energy intensity of the building. For example, the natural light available in a room throughout the day directly influences the amount of electrically generated lighting required and the specific hours the lighting is in demand. The thermal mass of a building determines how well a building retains heat; thereby affecting how much energy is required for temperature control. Thus, a building's design directly impacts its energy demands, resource intensity, and aggregate environmental impacts.

A. Purpose of Copyright Law

Intellectual property is the general body of law that governs the "intangible rights protecting commercially valuable products of the human intellect."[105] Intellectual property law includes copyright law, patent law, and trademark law.[106] In particular, copyright law concerns the protection, ownership, and use of literature, music, and art.[107] Congress derives the power to enact copyright laws and regulate artistic works from the Constitution. Specifically, Article I, section 8, clause 8, known as the Patent and Copyright Clause, states that "Congress shall have the power . . . [t]o promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries."[108]

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105. BLACK'S LAW DICTIONARY 881 (9th ed. 2009).
106. *Id.*
107. ROBERT A. GORMAN, FED. JUDICIAL CTR., COPYRIGHT LAW 1 (2d ed. 2006).
108. U.S. CONST. art. I, § 8, cl. 8.

The Framers of the Constitution intended to incentivize the development and dissemination of socially useful works by providing a limited monopoly to the creators of such work.[109] Copyright protections in the United States are considered statutory rights—rights granted to promote the public welfare and the "progress of science and the useful arts."[110]

B. Evolution of Copyright Law

The first federal copyright protection was enacted in the Copyright Act of 1790.[111] In 1909, the 1790 Act was revised into the Copyright Act of 1909.[112] The 1909 Act extended copyright protections to "all the writings of an author" and included a bifurcated protection period of an initial twenty-eight year term with a second twenty-eight year renewal term. [113] Additionally, the 1909 Act provided copyright protection from the moment of publication, rather than at the time of copyright registration as the 1790 Act previously had.[114]

With the advent of modern technologies, like the photograph and the motion picture, it became evident that the 1909 Act needed to be replaced by new legislation.[115] As a result, modern copyright law was enacted in 1976.[116] Although subsequently amended to afford broader protections, copyright law protects "original works of authorship fixed in any tangible medium of expression."[117] The Act provides protection for works for fifty years after the death of the author and protection for corporate works that extends seventy-five years after publication.[118]

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109. James B. Bucher, *Reinforcing the Foundation: The Case Against Copyright Protection for Works of Architecture*, 39 EMORY L. J. 1261, 1265–66 (1990).

110. U.S. CONGRESS, OFFICE OF TECHNOLOGY ASSESSMENT, INTELLECTUAL PROPERTY RIGHTS IN AN AGE OF ELECTRONICS AND INFORMATION 38 (1986) (citing the legislative committee report on the 1909 Copyright Act).

111. Copyright Act of 1790, 1 Stat. 124 (1790).

112. 17 U.S.C. § 1 (1909).

113. *Id.* §§ 4, 24.

114. *Id.* § 10.

115. MARSHALL LEAFFER, UNDERSTANDING COPYRIGHT LAW 9 (4th ed. 2005).

116. 17 U.S.C. § 102 (2006). The predecessor to the 1976 Act was the Copyright Act of 1909, which provided a system of copyright protection based on state common law. *See* GORMAN, *supra* note 107, at 2 (discussing the inadequacies and the importance of the 1909 Act).

117. 17 U.S.C. § 102.

118. GORMAN, *supra* note 107, at 3.

1. Architecture and Copyright Law

Under the 1909 Act, architectural works did not receive any protection under copyright law.[119] The 1976 Act extended protection to "pictorial, graphic, and sculptural works," which are defined to include "diagrams, models, and technical drawings"[120] Though the 1976 Act did not contain an explicit protection for architectural works, courts interpreted it to include architectural drawings as protected works.[121] However, copyright protection under the 1976 Act did not extend to three-dimensional or completed architectural works. Thus, constructed architectural works were not afforded any copyright protection under the 1976 Act. In pertinent part, Section 101 of the 1976 Act states that:

> [T]he design of a useful article, as defined in this section, shall be considered a pictorial, graphic, or sculptural work only if, and only to the extent that, such design incorporates pictorial, graphic, or sculptural features that can be identified separately from, and are capable of existing independently of, the utilitarian aspects of the article.[122]

Furthermore, a "useful article" is defined as "an article having an intrinsic utilitarian function that is not merely to portray the appearance of the article or to convey information."[123] Therefore, due to the utilitarian exception in the 1976 Act, copyright protection did not extend to any component that served a functional purpose. Since the design of a building has an inherently utilitarian purpose and its components serve structural, as well as aesthetic functions, architectural works were exempted from copyright protection. However, in 1990 Congress passed the Architectural Works Copyright Protection Act of 1990 (AWCPA),[124] which amended the Copyright Act to include "architectural works" as an enumerated protected authorship.[125] Congress passed the AWCPA to come into compliance with

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119. Copyright Act of 1909, Pub. L. No. 60-349, 35 Stat. 1075 (Mar. 4, 1909; repealed Jan. 1, 1978); Theresa V. Casey, *Copyright Protection for "Green Design" of Architectural Works: Beyond Functionality*, 1 NO. 5 LANDSLIDE 48 (2009).

120. 17 U.S.C. §§ 101, 102(a)(5); *Robert R. Jones Assoc., Inc. v. Nino Homes*, 858 F.2d 274, 278 (1988).

121. *Robert R. Jones Assoc., Inc.*, 858 F.2d at 278 (citing Demetriades v. Kaufmann, 680 F. Supp. 658, 663 n. 6 (1988) ("Consistent with explicit congressional intent, these sections have been interpreted to include architectural drawings.")).

122. 17 U.S.C. § 101 (1976) (emphasis added).

123. *Id.*

124. 17 U.S.C. § 106 (2006).

125. *Id.* § 102(a)(8).

the Berne Convention for the Protection of Literary and Artistic Works, which required protection for architectural plans and drawings in addition to the built structures.[126]

2. Extended Architectural Protection under Copyright Law

The AWCPA defines "architectural works" as "the design of a building embodied in any tangible medium of expression, including a building, architectural plans, or drawings." [127] Consequently, the Act provides protection for two-dimensional designs of unconstructed works, as well as three-dimensional or constructed works. However, the Act also provides that architectural work "includes overall form as well as the arrangement and composition of spaces and elements in the design, but does not include individual standard features."[128] Thus, copyright protection for architecture has utilitarian exceptions and limitations for structural or functional elements. In a 1961 report, the Register of Copyrights noted:

> While we are inclined to the view that a limited measure of protection should be afforded to the designs of functional structures, we do not believe that the copyright statute provides the appropriate framework for their protection.[129]

Functional elements in architectural works include structural members, spatial volumes, circulation, mechanical and electric systems, and construction methods.[130] Function also includes "building identity, clarity of form, views, natural light, accessibility, and life safety."[131]

To determine whether an architectural work is copyrightable, Congress, in enacting the AWCPA, suggested a two-prong test. First, an architectural work should be examined to determine whether there are original design elements present, including overall shape and interior architecture. If such design elements are present, the second step examines whether the design elements are functionally required. If the design elements are not

126. H.R. REP. NO. 101-735, at 18 (1990), *reprinted in* 1990 U.S.C.C.A.N. 6935, 6935.

127. 17 U.S.C. § 101; 37 C.F.R. § 202.11(b)(1), (c)(1) (2005).

128. 17 U.S.C. § 101.

129. U.S. COPYRIGHT OFFICE, THE REPORT OF THE REGISTER OF COPYRIGHTS ON WORKS OF ARCHITECTURE 94 (1989) (quoting H.R. JUDICIARY COMM., 87th CONG., REPORT OF THE REGISTER OF COPYRIGHTS ON THE GENERAL REVISION OF THE U.S. COPYRIGHT LAW (1961)).

130. Gregory B. Hancks, *Copyright Protection for Architectural Design: A Conceptual and Practical Criticism*, 71 WASH. L. REV. 177, 192 (1996).

131. *Id.*

functionally required, the work is protectable without regard to physical or conceptual separability.[132]

In creating this "functionality test," Congress explicitly intended to provide a specific test to determine whether an architectural work qualified for protection under copyright law. Traditionally, courts used a "separability test" to determine the scope of copyright protection for "pictorial, graphic, or sculptural" work.[133] Under the separability test, if an article's intrinsic function is its utility, then it is not protectable under copyright law. Conversely, if an article incorporates elements that can be identified separately from its utility, then these elements are protectable. Thus, although intended to create a different standard to determine the scope of protection for architectural works, the functionality and separability tests are effectively indistinguishable.

Therefore, similar to other works, architectural works only qualify for copyright protection when their design elements are not functionally required. This functionality limitation presents a significant problem in protecting architectural works. Functional considerations and requirements are a substantial part of a building's design. Many architects expressly acknowledge the intrinsic importance of function in their work.[134] Furthermore, architectural design is always limited by functional requirements: structural necessities, building codes, technologies, and construction techniques.[135] Thus, an architect's creativity is necessarily restrained by the fundamental need to accommodate and incorporate functional requirements.[136]

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132. H.R. REP. NO. 101-735, at 18, 20–21 (1990), *reprinted in* 1990 U.S.C.C.A.N. 6935, 6951–52. Under this two-prong test, if it is found that the original design elements are not required for functionality of the architectural work, then the work is protectable without regard to physical or conceptual separability of the elements. Under copyright law, in order for a "pictorial, graphic, or sculptural work[]" to qualify for protection, the design must be able to be identified independently from any utilitarian aspects. 17 U.S.C. § 101 (2006).

133. H.R. REP. NO. 101-735, at 18, 20 (1990), *reprinted in* 1990 U.S.C.C.A.N. 6935, 6951.

134. *See* Vanessa N. Scaglione, *Building Upon the Architectural Works Protection Copyright Act of 1990*, 61 FORDHAM L. REV. 193, 209 (1992) (describing how Le Corbusier's characterized his freedom of expression in his Dom-ino Houses by an underlying functional requirement; how Ludwig Mies van der Roche's lesson to his students was that "[w]e shall examine one by one every function of a building and use it as a basis for form;" and how many architects subscribe to the credo "form follows function").

135. *See* David E. Shipley, *Copyright Protection for Architectural Works*, 37 S.C. L. REV. 393, 399 (1986) (discussing how architects' creativity is often limited by functional requirements).

136. *Id.*

C. Copyright Protection and Sustainable Architecture

Sustainable architecture exemplifies the ambiguity of the functionality requirement. As previously discussed, all architectural works have an elemental functional quality. However, given that the inherent objective of sustainable architecture is function, sustainable architecture's protection under contemporary copyright law is equivocal. Green buildings are designed to maximize efficiency, reduce waste, improve indoor air quality, and reduce land use impacts. Accordingly, green buildings are purposefully designed to incorporate functionality in their design elements. Therefore, under the functionality test articulated by Congress, green buildings are unlikely to qualify for any effective copyright protection.

D. Implications for Growth of Sustainable Architecture

The uncertainty of copyright protection for sustainable architecture and green building design creates a significant deterrent in encouraging the development of green buildings. First, the ambiguity and likely preclusion of protection under copyright law removes the creative incentive established in the Constitution. Since its inception, the United States has considered it imperative to incentivize work that encourages progress in science, useful arts, and original works. Furthermore, the history of U.S. copyright law and the subsequent amendments to the Copyright Act evince the continuous affirmation by Congress of the significance of fostering such progress. Granting limited monopolies to the creators of artistic works promotes the public welfare and promulgates innovation. Removing the pecuniary incentive of copyright protection reduces the likelihood an architect would pursue such innovative avenues of architectural design.

Furthermore, given a building's deleterious environmental impacts, the need to develop innovative designs and encourage green buildings is vital. The development of sustainable architectural designs is precisely the type of innovation that copyright law was intended to incentivize. Green building design offers the opportunity to minimize the adverse environmental effects that conventional buildings produce. Green buildings use natural resources more efficiently, consume less energy and electricity, emit less GHGs, use land more productively, and create healthier indoor environments. With respect to climate change, green buildings' decreased energy demand will correlate to fewer GHG emissions. Consequently, the general welfare benefits of sustainable architecture are significant. Accordingly, American copyright law needs to evolve to provide the necessary incentives and protections to encourage the development of a socially and environmentally sustainable building infrastructure.

CONCLUSION

The benefits of sustainable architecture and green building design are indisputable. In addition to reducing resource intensity, improving indoor health, creating more efficient land use plans, and increasing property values, green building design reduces a building's energy consumption and overall GHG emissions. Despite the widespread initiatives to implement green building programs, however, certain legal impediments disincentivize the robust development of sustainable architecture in the United States.

In particular, federal legislation regulating energy efficiency appliance standards for residential, commercial, and industrial buildings has been held to preempt state laws seeking to achieve greater energy efficiency in buildings. [137] Further, federal legislation also preemptively deters the development of progressive state and local policies due to concern regarding the broad application of the federal preemption doctrine. Accordingly, the doctrine of federal preemption—though often an effective doctrine to advance innovative policies—impedes the states' ability to enact more stringent energy efficiency appliance standards. Consequently, in this narrow context, states may be prevented from mandating stricter building codes, inhibiting the implementation of green building designs.

Additionally, the ambiguity of copyright protection for sustainable architecture eliminates the constitutional incentive to propagate socially useful works by providing limited monopolies to such creations.[138] Under current copyright law, copyright protection is only afforded to architectural designs that do not exceed a particular functionality threshold. Given the inherent functionality of green building design, it is unlikely that green buildings will meet this statutory standard, thereby excluding green buildings from copyright protection and removing the incentive for architects to pursue innovative sustainable architectural design.

Green buildings provide an opportunity to improve the environmental, health, social, and financial impacts of the American building infrastructure. As resource-intensive and energy-demanding structures, buildings account for a significant portion of global GHG emissions and substantially affect the quality of human health. Green buildings seek to minimize the adverse environmental and human health effects of conventional building design. Accordingly, it is imperative to foster a legal

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137. *See* Air Conditioning, Heating, and Refrigeration Institute, et al. v. City of Albuquerque, 835 F. Supp. 2d 1133, 1136 (D. N.M. 2010) (holding that the city's provision requiring "energy efficiency standards more stringent than federal standards are regulations that concern the energy efficiency of covered products and, therefore, are preempted as a matter of law").

138. Bucher, *supra* note 109.

environment that encourages the development and implementation of sustainable architecture and green building design.