

A GUIDE TO SOLAR PANEL INSTALLATION AT GRAND CENTRAL TERMINAL: CREATING A POLICY OF SUSTAINABLE REHABILITATION IN LOCAL AND NATIONAL HISTORIC PRESERVATION LAW

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INTRODUCTION

“There may have been a time when preservation was about saving an old building here and there, but those days are gone. Preservation is in the business of saving communities and the values they embody.”¹

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The twin movements of sustainability and historic preservation emerged in the late twentieth century with agendas for conservation in the natural and built environment. While historic preservation sought to preserve a physical and aesthetic link to the past,² sustainable building sought to preserve the future of the world's natural resources.³ Despite the "profound overlap" of the preservation-through-reuse concept, sustainable building proponents and historic preservationists (preservationists) have diverged into the opposing sides of energy versus history.⁴

Through early lobbying success, historic preservation was bolstered by a multi-level legal framework, creating the single greatest restriction on private property ownership rights: the local historic preservation ordinance.⁵ However, the preservationist's tools, including the local ordinance, guidelines of the Secretary of the Interior, and the National Historic Preservation Act (NHPA), have placed a policy premium on historic materials at the cost of resource efficiency. Yet the preservation of history and the preservation of natural resources are not, and should not be, mutually exclusive. As a result, this article will address the policies of historic preservation and sustainable building to show that sustainable building practices and historic preservation can coalesce to affect the goals of preservation in the built and natural environment through the practice of sustainable rehabilitation.

The purpose of this article is to propose the practice of *sustainable rehabilitation* through a revised policy of preservation. First, the article will provide an introduction to historic preservation and the impetus for the emerging policy of protecting the built environment. Second, the article will summarize the "multitiered" legal basis for preservation efforts, including the seminal U.S. Supreme Court decision in *Penn Central Transportation Co. v. New York City (Penn Central)*.⁶ Third, the article will

for their work on this article; and the City of Burlington, Vermont for inspiring interest in preservation and sustainability.

1. Chere Jiusto, *Trustees for Those Who Come after Us*, 1 DRUMLUMMON VIEWS 177, 181 (2006) (quoting Richard Moe, President of the National Trust for Historic Preservation), available at http://www.drumlummon.org/images/PDF-Spr-Sum06/DV_1-2_Jiusto.pdf.

2. NORMAN TYLER, HISTORIC PRESERVATION: AN INTRODUCTION TO ITS HISTORY, PRINCIPLES, AND PRACTICE 12 (1994).

3. Alex Hawes, *Going Green: Soybean Countertops, Solar Panels, and Skylights Save Energy—and Aging Buildings*, PRESERVATION MAGAZINE, Nov. 27, 2001, available at <http://www.preservationnation.org/magazine/2001/story-of-the-week/Going-Green.html>.

4. *Id.* (quoting Russell Perry, managing partner of William McDonough and Partners of Charlottesville, V.A.).

5. See *Penn Cent. Transp. Co. v. New York City*, 438 U.S. 104 (1978) (legitimizing government property restrictions in the most important legal precedent for historic preservation).

6. *Id.*

provide an analysis of the federal standards, which the multitiered players reference for project approval and tax incentives. Finally, the article will discuss the policy of sustainable building and the practices that can be incorporated into historic preservation efforts to create a prevailing policy of sustainable rehabilitation.

Originating as a movement to preserve our physical link to the past, historic preservation has become one of the most powerful restrictions on the private property right of possession and control.⁷ Although changing policies, post-Vietnam guilt, and bicentennial-era patriotism fueled pride in our nation's heritage,⁸ the economy of the 1970s created a practical need to preserve our past: simply, it cost less to rehabilitate an older building than to construct a new one.⁹ Thirty years later, the nation faces another practical need: preservation of energy resources for future generations.¹⁰

The impact of buildings on the natural environment and resources is substantial.¹¹ According to a report by the U.S. Green Building Council, "the built environment accounts for approximately one-third of all energy, water, and materials consumption and generates similar proportions of pollution."¹² In the past decade, the recognition of the environmental effects of the built environment on the natural environment and the world's resources has resulted in "high-performance green-building[s]," and the development of the prestigious Leadership in Energy and Environmental Design (LEED™) standards by the U.S. Green Building Council.¹³ Yet true sustainability requires not only a "market transformation" and advances in

7. Leonard A. Zax, *Protection of the Built Environment: A Washington, D.C. Case Study in Historic Preservation*, 19 B.C. ENVTL. AFF. L. REV. 651, 652-53 (1992).

8. See Robert Stipe, *Why Preserve Historic Resources?*, in READINGS IN HISTORIC PRESERVATION: WHY? WHAT? HOW? 59, 59 (Norman Williams, Jr. et al. eds., 1983) (discussing how nostalgia and patriotism influence historic preservation).

9. JAMES MARSTON FITCH, *HISTORIC PRESERVATION: CURATORIAL MANAGEMENT OF THE BUILT WORLD* 169 (1982).

10. See NAT'L ENERGY POLICY DEV. GROUP, *NATIONAL ENERGY POLICY: RELIABLE, AFFORDABLE, AND ENVIRONMENTALLY SOUND ENERGY FOR AMERICA'S FUTURE* 1-1 to 1-14 (2001) (discussing energy challenges facing the United States), available at http://www.netl.doe.gov/publications/press/2001/nep/national_energy_policy.pdf.

11. U.S. GREEN BLDG. COUNCIL, *BUILDING MOMENTUM: NATIONAL TRENDS AND PROSPECTS FOR HIGH-PERFORMANCE GREEN BUILDINGS* 1 (2002), available at http://www.usgbc.org/docs/resources/043003_hpgb_whitepaper.pdf. This report, the result of the April 24, 2002 Green Building Roundtable, provides an overview of the federal government's efforts to encourage green building and discusses the trends in green building construction.

12. *Id.*

13. *Id.*

building technologies,¹⁴ but also a revised policy of preservation and sustainable rehabilitation of existing buildings.¹⁵

I. THE HISTORICAL, SOCIAL, AND LEGAL ORIGINS OF MODERN HISTORIC PRESERVATION

A. *The Social Basis for Historic Preservation Law and Policy*

Conceptually, historic preservation has been part of our nation's vernacular since the formation of the Mount Vernon Ladies' Association of the Union (MVLA) in 1853 to save George Washington's degenerating Mount Vernon estate.¹⁶ Created out of national patriotism, the catalyst behind the formation of the MVLA elicited the touchstone question for the succeeding century of historic preservation: *Did Washington sleep here?*¹⁷ However, the preservation movement that emerged during the late 1960s and the 1970s localized and nominated historic classification to expand deserving properties.

The social climate of the 1970s, post-war guilt, bicentennial-era patriotic healing, environmental social activism, and economic recession were the impetuses for America's "restoration and preservation boom."¹⁸ Earlier preservation efforts were limited to historical landmarks and patriots' residences, fating historic yet anonymous locations to deconstruction "under the guise of progress."¹⁹ While the earlier American habit related to American tradition of focusing on opportunism, not preservation, the recognition in the 1970s of the value of preserving the physical and aesthetic link to the past created the dichotomy of preserving the past while moving towards the future.²⁰

The historic preservation movement that emerged during the 1970s recognized that our nation's past "is integral to our future."²¹ Not only do the structures of previous decades and centuries create a physical link to our

14. *Id.*

15. Although this article focuses on a policy of sustainable rehabilitation, green building construction for new structures is a vital component of the sustainability movement.

16. TYLER, *supra* note 2, at 33.

17. *Id.* at 33–34, 42.

18. ALICE CROMIE, *RESTORED AMERICA: A TOUR GUIDE: THE PRESERVED TOWNS, VILLAGES AND HISTORIC CITY DISTRICTS OF THE UNITED STATES AND CANADA*, at xi (1984).

19. *Id.*

20. TYLER, *supra* note 2, at 12.

21. *Id.*

past, they also preserve earlier expectations for our nation's progress.²² In an era of "increasing cultural homogeneity," the organizations and people that fueled the resurgence of preservation wanted to honor the art, education, history, and nostalgia of days-gone-by through a broader touchstone question: *How did ordinary people live?*²³ As the protection of the physical and aesthetic environment took on local historic character (as opposed to the previous national question of significance) the "historic preservation ordinance has evolved as a legitimate governmental tool for the protection of individual landmarks and entire historic neighborhoods."²⁴

B. Defining Historic Preservation

As this article has previously noted, historic preservation was originally a hobby of architects and not a legally supported public policy.²⁵ Therefore, it is beneficial to define a number of architectural terms, which identify various historic preservation efforts. For the purposes of this article, and a baseline understanding of historic preservation, there are four primary terms which define historic preservation efforts: preservation, restoration, reconstruction, and rehabilitation. The similarity and commonality of the terms creates a tendency to use them interchangeably; however, the purpose of the preservation efforts and zoning regulations will dictate the specific term.

Preservation is defined as an act of maintaining a landmark or district without considerable modification to the original or current condition.²⁶ Ultimately, preservation is defined by the form it takes, which includes: restoration, the process of restoring property to its original condition; reconstruction, the process of replicating a historic structure; or rehabilitation, the process of adapting the use of property for a new purpose.²⁷ The primary focus of this article is the act of rehabilitation or adaptive use. In addition to adapting the use for a new purpose, rehabilitation also includes the act of modifying a property to update its utility.²⁸ The concept of updated utility encompasses a broad scope of modifications ranging from the addition of solar panels and energy-efficient

22. Stipe, *supra* note 8.

23. *Id.*

24. Joe P. Yeager et al., *Preservation Law Survey 2001: State Preservation Law*, 8 WIDENER L. SYMP. J. 463, 465 (2002).

25. TYLER, *supra* note 2, at 12.

26. *Id.* at 22.

27. *Id.* at 22–28.

28. 36 C.F.R. § 68.3(b)(1)–(5) (2008).

windows to façadism, which modifies the interior of the building while preserving the original façade.²⁹

In particular, the Secretary of the Interior defines rehabilitation as “the process of returning a property to a state of utility, through repair or alteration, which makes possible an efficient contemporary use while preserving those portions or features of the property which are significant to its historic, architectural, and cultural values.”³⁰ This definition is not at odds with the principle purposes of sustainable building practices; however, Part II of this article will show that the standards set forth by the Secretary of the Interior unnecessarily hinder widespread incorporation of sustainable practices.³¹

C. *The Legal Basis for Historic Preservation Law and Policy*

This section will discuss the multitiered legal basis for historic preservation, defined by the interplay between national, state, and local governments who guard the nation’s historic resources.³² While the federal government’s role in historic preservation can be traced to the Antiquities Act of 1906, the multitiered relationship, which defines modern historic preservation, did not take form until the historic preservation movement of the late 1960s and early 1970s.³³ The current federal law that grew out of the historic preservation movement is responsible for both changing courts’ perspective on the legal legitimacy of aesthetic property regulations and preserving thousands of local and national properties.³⁴ However, the

29. *Id.*

30. U.S. DEPT. OF THE INTERIOR, SECRETARY OF THE INTERIOR’S STANDARDS FOR REHABILITATION (rev. 1983), available at <http://www.nps.gov/history/hps/tps/tax/rhb/stand.htm>. The Secretary of the Interior’s Standards for the Treatment of Historic Properties adds that:

New additions, exterior alterations or related new construction will not destroy historic materials, features and spatial relationships that characterize the property. The new work will be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.

36 C.F.R. § 68.3(b)(9) (2008). The Standards for Rehabilitation also provide that: “New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.” 36 C.F.R. § 68.3(b)(10) (2008).

31. See U.S. DEPT. OF THE INTERIOR, *supra* note 30. (describing the Secretary’s Standards for Rehabilitation). See also 36 C.F.R. § 67 (2008) (codifying the Secretary’s Standards for Rehabilitation for use in the Federal Historic Preservation Tax Incentives Program).

32. Zax, *supra* note 7, at 651.

33. PAUL GOLDSTEIN & BARON H. THOMPSON, JR., PROPERTY LAW: OWNERSHIP, USE, AND CONSERVATION 1040 (2006).

34. TYLER, *supra* note 2, at 45.

requirements of historic preservation regulations have stifled energy-efficient rehabilitation or modifications.

The federal role comprises the first tier in the multitiered legal basis for historic preservation.³⁵ As the nation recognized the social and economic values associated with preserving the built environment, the nonprofit and private organizations that led this movement in the 1960s and 1970s advocated for increased support from the federal government.³⁶ In particular, the efforts of the National Trust for Historic Preservation and its report, *With Heritage So Rich*, proposed support from the federal government and illustrated the detrimental loss of historic architecture.³⁷ Congress responded with the National Historic Preservation Act of 1966 (NHPA) which, along with the National Environmental Policy Act of 1969 (NEPA) and § 4(f) of the Department of Transportation Act, protects and preserves the resources of the historic built environment.³⁸

Congress's stated purpose for enacting the NHPA incorporates the social values that motivated early historic preservationists³⁹ and "respond[s] to the need for stronger national protective legislations for historic properties."⁴⁰ The values declared by Congress in the NHPA include preservation of historic heritage, which is a "legacy of cultural, educational, aesthetic, [and] inspirational . . . benefits"⁴¹ as well as preservation of community life⁴² in the face of urban sprawl⁴³ and the "throw-away city."⁴⁴

Significant provisions included in the NHPA for the federal government's role in historic preservation include the following: 1) creation of the National Register of Historic Places;⁴⁵ 2) requirements for the promulgation and administration of State Historic Preservation Programs;⁴⁶ 3) requirements of enabling mechanism for "local governments to carry out the purposes" of this Act;⁴⁷ and 4) preservation standards for federally-owned properties, including technical advice.⁴⁸

35. *Zax*, *supra* note 7, at 651.

36. TYLER, *supra* note 2, at 44.

37. *Id.*; see NAT'L TRUST FOR HISTORIC PRES., WITH HERITAGE SO RICH (1966).

38. Yeager et al., *supra* note 24, at 463–64.

39. 16 U.S.C. § 470(b)(1)–(b)(7) (2000).

40. Christopher Parkin, *A Comparative Analysis of the Tension Created by Disability Access and Historic Preservation Laws in the United States and England*, 22 CONN. J. INT'L L. 379, 383 (2007).

41. 16 U.S.C. § 470(b)(4).

42. *Id.* § 470(b)(2).

43. *Id.* § 470(b)(5).

44. FITCH, *supra* note 9, at 31.

45. 16 U.S.C. § 470a(a).

46. *Id.* § 470a(b).

47. *Id.* § 470a(c).

48. *Id.* § 470a(h)–(i).

The second tier of historic preservation legislation occurs at the state level,⁴⁹ where the state provides the link between the federal structure and funding and the local legal ordinance.⁵⁰ Section (b)(1) of the NHPA authorizes the Secretary of the Interior to “promulgate or revise regulations for State Historic Preservation Programs.”⁵¹ Although state historic programs existed prior to the enactment of the NHPA, “they tended to be limited in scope . . . includ[ing] the operation of state-administered museums, historic sites, and highway or structure marker programs.”⁵² The federal tier, through the NHPA, provides states with grants and other federal funding,⁵³ and requires states to establish a State Historic Preservation Office,⁵⁴ which “serv[es] as the funding conduit from the national to the local level.”⁵⁵ Most importantly, the state tier enacts the enabling statutes, required by the NHPA, which grant police power to the states to regulate private property actions that affect local historic resources.⁵⁶ In the United States, the power of the local historic preservation ordinance, granted by the state to the local governments, “is one of the most powerful government restrictions that courts have upheld on private property rights.”⁵⁷

The result of the state-enabling statutes is that the second and third tiers of historic preservation law work together to frequently prevent private property owners from “demolish[ing], modify[ing], or otherwise alter[ing] the exterior of its building without the express approval of the local board or commission.”⁵⁸ Therefore, the policy of historic preservation, which originated in private organizations and as a hobby of architects and historians, has transformed over the past forty years into a powerful governmental restriction on private property rights.⁵⁹

The local level is the third and most active tier of historic preservation legislation.⁶⁰ By the mid-1970s over 500 municipalities, which included many of the nation’s largest cities, had enacted landmark preservation laws.⁶¹ While the federal level provides the overall framework of

49. Yeager et al., *supra* note 24, at 464.

50. TYLER, *supra* note 2, at 55.

51. 16 U.S.C. § 470a(b)(1).

52. TYLER, *supra* note 2, at 52.

53. 16 U.S.C. § 470a(e).

54. *Id.*

55. TYLER, *supra* note 2, at 53.

56. Yeager et al., *supra* note 24, at 464.

57. *See id.* at 464–65 (citing Zax, *supra* note 7, at 653).

58. Zax, *supra* note 7, at 652–53.

59. Harmon H. Goldstone, *The Administrative, Legal and City Planning Role in Historic Preservation*, in READINGS IN HISTORIC PRESERVATION: WHY? WHAT? HOW?, *supra* note 8, at 74.

60. TYLER, *supra* note 2, at 55.

61. Penn Cent. Transp. Co. v. New York City, 438 U.S. 104, 107 (1978).

preservation, it has no regulatory authority.⁶² Instead, regulatory power to enact preservation laws is preserved for the local municipality to protect and preserve properties through legal ordinances.⁶³

The local police power, derived from state enabling statutes to enact regulations that protect historic preservation interests and aesthetic values, has been recognized as a valid exercise of police power.⁶⁴ Pursuant to this police power, the local community will decide the extent to which the legislature enacts legislation.⁶⁵ Among the powers delegated to the local municipality are the powers to survey, identify, designate, and review historically significant structures and districts.⁶⁶

Finally, a crucial legal tool in local historic preservation is the creation and designation of a local historic district.⁶⁷ In order to designate a historic district, the municipality must first establish a historic district planning commission,⁶⁸ and the commission must “prepare a report containing an analysis of the significance of the proposed area or landmark.”⁶⁹ A municipality should consider the promotion of public welfare, involvement of local institutions in the designation process, and opposition from private citizens.⁷⁰ The local ordinance operates as a powerful restriction on private property rights since private property owners within the boundaries of the district lose their right to alter exterior features, tear down, or relocate a structure without permission from the historic district planning commission.⁷¹

D. Penn Central Transportation Co. v. New York City: Validating the Local Ordinance

The power of the local preservation ordinance over the historic recognition of private property rights is best illustrated by the U.S. Supreme Court’s decision in *Penn Central Transportation Co. v. New York City*, 438

62. TYLER, *supra* note 2, at 55.

63. *Id.*

64. A-S-P Assocs. v. City of Raleigh, 258 S.E.2d 444, 449–50 (N.C. 1979).

65. See TYLER, *supra* note 2, at 55 (describing the extent of control the local community has, through its legislative body, to make decisions).

66. *Id.*

67. *Id.*

68. *Id.*

69. Vermont Division for Historic Preservation, <http://www.historicvermont.org/info/local.html#establish> (last visited Mar. 16, 2007). See also Division for Historic Pres., Dep’t. of Hous. and Cmty. Affairs, Vermont Historic Preservation Act Rules, Rule 3.3.1.1(2) (describing the establishment and composition of a historic preservation review commission).

70. TYLER, *supra* note 2, at 75–78.

71. Vermont Division for Historic Preservation, *supra* note 68.

U.S. 104 (1978).⁷² While *Penn Central* is specifically classified as a takings case, its holding—that New York City may place restrictions on the development of historic landmarks as part of a comprehensive historic preservation program—legitimized the central goals of historic preservation and “put to rest concerns over the legitimacy of governmental property restrictions.”⁷³ Decided during the height of the historic preservation movement, the *Penn Central* decision is not only recognized as the most important legal precedent in historic preservation legislation,⁷⁴ but it also validated the power of the local ordinance as a legal preservation tool.⁷⁵

The Penn Central Transportation Company, owner of Grand Central Terminal, applied to New York City’s Landmark Preservation Commission with a plan to construct a fifty-five-story office building in the airspace above the roof of the terminal.⁷⁶ The commission responded that “to balance a 55-story office tower above a flamboyant Beaux-Arts façade seems nothing more than an aesthetic joke.”⁷⁷ In support of the City of New York, the U.S. Supreme Court upheld the historic preservation law’s limitation on property alterations and legalized the limitation on property owners’ rights with respect to historic landmarks.⁷⁸ Ultimately, “preservation programs were catalyzed by the Court’s decision that a historic preservation law . . . was valid to achieve historic preservation.”⁷⁹

As this article suggests, the growing need to incorporate energy efficient alternatives may present a public policy which is equally as valid as preservation of historic architecture, engineering, and aesthetics. *Penn Central* prevented private owners from utilizing the airspace above Grand Central Terminal, pursuant to their private property interest, in the policy interest of preserving one of the city’s most famous buildings.⁸⁰ While the outcome of *Penn Central*—the preservation of an engineering ingenuity

72. Historic preservation case law is limited, and usually involves the constitutionality of the zoning ordinance or police power application. Since the NHPA provides states the authority to enable local communities to enact regulations, appeals to zoning restrictions and limitations progress through a series of local and state-level zoning appeal boards or commissions. Rarely will the appeals result in reported case law. However, for cases concerning historic preservation, see for example, *Metro. Dade County v. P.J. Birds, Inc.*, 654 So.2d 170 (Fla. Dist. Ct. App. 1995); *Russell v. Town of Amite City*, 771 So.2d 289 (La. Ct. App. 2000); *Cynwyd Invs., Inc. v. Town of N. Hempstead*, 627 N.Y.S.2d 433 (N.Y. App. Div. 1995).

73. Yeager et al., *supra* note 24, at 466.

74. TYLER, *supra* note 2, at 84.

75. Yeager et al., *supra* note 24, at 466.

76. *Penn Cent. Transp. Co. v. New York City*, 438 U.S. 104, 116 (1978).

77. *Id.* at 117–18.

78. *Id.* at 138.

79. Yeager et al., *supra* note 24, at 466.

80. *Penn Central Transp. Co.*, 438 U.S. at 138.

and superlative representation of the French beaux-arts style⁸¹—arguably is preferable to the proposed sky scraper, the legal implications have created a dichotomy between the policies of historic preservation and the societal benefits of private property ownership. What if the Penn Central Transportation Company had proposed solar roof panels instead of the office tower? The initial mental image would have compared the 1968 design for Grand Central Terminal by Marcel Breuer, which incontrovertibly altered the façade by dwarfing the terminal below with glass and steel, with low-profile solar panels. Solar panels are undoubtedly the lesser of two evils and their utility directly advances energy-saving policy; however, solar panel application has not been readily embraced for landmarks and historic districts.⁸² Instead, the holding in *Penn Central* has been invoked to support preservation laws and property restrictions across the country.⁸³

II. AESTHETICS VERSUS FUNCTION: COALESCING IN PRESERVATION

The remaining sections of this article will examine the current federal standards for rehabilitation of historic landmarks and districts; sustainable building practices (including materials, energy, and economic savings); examples of municipalities that have successfully incorporated sustainable practices into their historic preservation criteria; and recommendations for a broader application of sustainable building practices in historic rehabilitation.

A. The Secretary of the Interior's Standards for Rehabilitation: Hindering Sustainable Rehabilitation

While the Standards for Rehabilitation were originally codified to guide the review of work proposals on registered properties within the Historic Preservation Fund grant-in-aid program, they have served as a widely referenced guide throughout the multitiered system of historic preservation

81. *Id.* at 115.

82. See Ann Butler, *Board Wants Smiley to Mask Solar Panels: Members Ask Building to Screen Roof-Top Objects*, THE DURANGO HERALD, Sept. 20, 2007, available at http://archive.durangoherald.com/asp-bin/article_generation.asp?article_type=news&article_path=/news/07/news070920_5.htm (“The solar panels on the theater portion of the building caused controversy earlier this year because the owners had installed them without presenting them to the Historic Preservation Board or obtaining a building permit.”). For an article on guideline limitations on historic preservation commission’s solar panel approval, see Kathryn G. Menu, *Solar Savings Difficult in Historic Village*, THE SAG HARBOR EXPRESS, Nov. 15, 2007.

83. Yeager et al., *supra* note 24, at 466.

law.⁸⁴ In particular, local officials have utilized the standards as a guideline for local proposals.⁸⁵ Additionally, while the definition of rehabilitation set forth by the Secretary is not at odds with practices of sustainability, the *intent* of the Standards is. The intent “to assist in long-term preservation of a property’s significance through the preservation of historic materials and features”⁸⁶ creates a policy preference for “historic materials,” regardless of their sustainable properties, over sustainable materials, which would equally serve the end goal of “efficient contemporary use while preserving those portions and features of the property which are significant.”⁸⁷ The policy preference for historic materials is consistent with the policies of the historic preservation movement. However, the growing need to preserve resources for future generations, encourage energy-efficient alternatives, utilize existing buildings in the interest of conservation and waste-avoidance, and optimally preserve the education and cultural values of a structure, suggests that sustainability and rehabilitation can, and should, coalesce.

Before addressing the ease and utility with which sustainability and rehabilitation can coalesce, it is important to discuss the current standards that federal, state, and local governments are utilizing to review project proposals. As a preliminary matter, restrictions on projects and materials are necessary to serve the essential goal of historic preservation: preservation of the past. However, preservation of the past and sustainability need not be mutually exclusive ends. The effect of the current standards is to create a policy preference for historic accuracy, even where sustainable building practices would not aesthetically jeopardize the goals of historic preservation.

Zoning restrictions on landmarks and other historic properties are essential to achieving the goals of preservation. Restrictions on materials, modification, and paint-color are justified by “historical accuracy,” and the preservation goal to maintain “appearance[s] of uniformity and harmoniousness in the face of diversity and historical complexity.”⁸⁸ Therefore, in order to preserve components of the “daily life” of the past,

84. Technical Pres. Servs., The Secretary of the Interior’s Standards for Rehabilitation, <http://www.nps.gov/history/hps/tps/tax/rhb/stand.htm> (last visited Mar. 16, 2009).

85. *Id.*

86. *Id.*

87. *Id.*

88. David F. Tipson, *Putting the History Back in Historic Preservation*, 36 URB. LAW. 289, 303 (2004).

local commissions and preservationists must review project proposals by considering all aspects of the total cultural environment.⁸⁹

In addition to the Secretary of the Interior's Standards for Rehabilitation, the local commissions and preservationists will consider the aesthetic ambitions of the architect and original owners, the aging condition that the architect anticipated when the building was constructed,⁹⁰ and preservation of a historical property in the proper physical context.⁹¹

The Secretary of the Interior's Standards require that federal, state, and local governments apply the Standards "to specific rehabilitation projects in a reasonable manner, taking into consideration economic and technical feasibility."⁹² Specifically, the Standards are used to qualify properties for "certified rehabilitation," which permits the property's listing on the National Register of Historic Places,⁹³ and to determine eligibility for the preservation tax incentives.⁹⁴ The Standards require "minimal change to the defining characteristics of the building,"⁹⁵ and the preservation of historic character through "distinctive features, finishes, and construction techniques."⁹⁶

Energy efficiency is not a part of historic preservation; instead, efficiency efforts are "assessed for its potential negative impact on [a] building's historic character."⁹⁷ Although energy-efficiency efforts have been undertaken in some of our nation's landmarks,⁹⁸ local preservation efforts have been slow to incorporate sustainable practices since the federal

89. N.Y. State Board of Historic Preservation, *Historic Resources Survey Manual: The "New Preservation,"* in READINGS IN HISTORIC PRESERVATION: WHY? WHAT? HOW?, *supra* note 8, at 52.

90. FITCH, *supra* note 9, at 245.

91. N.Y. State Board of Historic Preservation, *supra* note 88.

92. 36 C.F.R. § 67.7(b) (2008).

93. *Id.* § 67.6.

94. NAT'L PARKS SERV., U.S. DEP'T OF THE INTERIOR, PRESERVATION TAX INCENTIVES FOR HISTORIC BUILDINGS 7 (2004), available at <http://www.nps.gov/history/hps/tps/tax/brochure1.htm>. The tax credits, twenty percent for certified rehabilitation of certified historic structures or ten percent for rehabilitation of non-historic structures, is a substantial incentive to private property owners. Unlike an income tax deduction, the tax credit reduces taxes owed by the appropriate percentage of the total cost of rehabilitation. *Id.*

95. 36 C.F.R. § 67.7(b)(1) (2008).

96. *Id.* § 67.7(b)(2)–(5).

97. NAT'L PARKS SERV., U.S. DEP'T OF THE INTERIOR, *supra* note 94.

98. See U.S. DEP'T OF AGRIC., ADMINISTRATIVE AND FINANCIAL MANAGEMENT, PROCUREMENT AND PROPERTY DIVISION POLICY MEMORANDUM: ENERGY INITIATIVES 1 (2000), available at <http://www.afm.ars.usda.gov/acquisitions/pdffiles/pm-23-02.pdf> ("[T]he President has signed several executive orders which promote and mandate the Greening of the Federal Government."); see also FED. ENERGY MGMT. PROGRAM, U.S. DEP'T OF ENERGY, GREENING PROJECT STATUS REPORT: THE WHITE HOUSE 1 (2001), available at http://www1.eere.energy.gov/femp/pdfs/greening_whitehouse.pdf ("The purpose of the project is to demonstrate to the nation numerous energy-efficient measures that can be adopted . . .").

guidelines only provide incentives for minimal change and use of historic materials. Additionally, the Secretary of the Interior strongly discourages many practices which would provide valuable energy and economic savings. For example, installing wall insulation in locations other than cellars and crawl spaces, replacing inefficient windows, or installing interior storm windows are discouraged because of the potential negative effects on historic materials.⁹⁹

Yet, the concept of preservation generally is a substantial unifier between the twin movements of sustainable building and historic preservation.¹⁰⁰ As the green movement gains momentum amidst a growing national need to conserve energy and preserve resources for future generations, historic preservationists and environmentalists must unite in the common goal of preservation. While operating as concordant policies, “[n]o sustainable preservation project . . . is achieved without sacrifice and compromise. . . . [Instead,] [s]ometimes the energy side might win, and other times the historic side needs to win.”¹⁰¹ Yet preservation success requires a public policy of compromise: the guidelines by which local commissions and preservationists approve projects must incorporate incentives and suggestions for sustainable designs. In the “mutlitiered” system that regulates and provides incentives for historic preservation, opportunities to promote sustainable building practices exist at the federal level, and at the local level where “authority is given to review and approve or disapprove changes to historic structures.”¹⁰²

B. Sustainable Building Practices: Resource Preservation for Future Generations

The goals of sustainable building mirror many of the goals of historic preservation. Both movements emerged contemporaneously and echoed concerns for preservation and resource protection.¹⁰³ While historic preservation sought to preserve a physical and aesthetic link to the past,¹⁰⁴ greening and sustainable building sought to preserve the future.

99. NAT'L PARKS SERV., U.S. DEP'T OF THE INTERIOR, *supra* note 94.

100. Hawes, *supra* note 3.

101. *Id.*

102. TYLER, *supra* note 2, at 55.

103. See Hawes, *supra* note 3 (describing the twin movements of historic preservation and environmental conservation, which may be reconciling their differences after forty years of independent maturation).

104. See TYLER, *supra* note 2, at 12 (discussing preservationists' deep commitment to preserving the past).

The classic definition of sustainability, derived from the Brundtland Commission, is “development that meets the needs of the present without compromising the ability of future generations to meet their own needs,”¹⁰⁵ or a practice where the utilization of resources is in symbiosis with future human demand and need.¹⁰⁶ The primary goal of the sustainability movement is to ensure both adequate resources and environmental quality for future generations.¹⁰⁷ Sustainability will ensure adequate natural resources by reducing both the consumption and waste of resources, which protects the biodiversity of natural systems.¹⁰⁸ Consequently, sustainability is viewed as a positivist doctrine, where the conditioned use of natural resources is based on a concern for future human consumption.¹⁰⁹

Sustainable development can take multiple forms including sustainable construction, green building, sustainable architecture, and resource-efficient construction.¹¹⁰ Additionally, the practice of recycling is vital to efficient material use. The act of reusing materials simultaneously preserves resources for future applications and satisfies the goals of sustainable building.

Historic preservation is, in itself, an act of reuse and sustainability. Notably, green building practices for new construction are increasingly common.¹¹¹ The focus of sustainable construction and design has been primarily energy efficiency, indoor environmental quality, and reduction of building debris, waste, and water consumption.¹¹² Yet, building debris constitutes an estimated forty percent, or one hundred thirty-six million tons, of the building related construction and demolition refuse in U.S. landfills.¹¹³ Because of the waste from building debris and the energy

105. Bob Pepperman Taylor, *Comments on Sustainability*, in *THE MORAL AUSTERITY OF ENVIRONMENTAL DECISION MAKING: SUSTAINABILITY, DEMOCRACY, AND NORMATIVE ARGUMENT IN POLICY AND LAW* 301, 301 (John Martin Gillroy & Joe Bowersox eds., 2002).

106. *Id.* at 301–02.

107. Charles J. Kibert, *The Promise and Limits of Sustainability*, in *RESHAPING THE BUILT ENVIRONMENT: ECOLOGY, ETHICS, AND ECONOMICS* 9, 9 (Charles J. Kibert ed., 1999).

108. *Id.*

109. John Martin Gillroy, *Sustainability: Restricting the Policy Debate*, in *THE MORAL AUSTERITY OF ENVIRONMENTAL DECISION MAKING: SUSTAINABILITY, DEMOCRACY, AND NORMATIVE ARGUMENT IN POLICY AND LAW*, *supra* note 105, at 291, 291–92.

110. Kibert, *supra* note 106.

111. See U.S. Environmental Protection Agency, Green Building, <http://www.epa.gov/greenbuilding> (last visited Mar. 16, 2009) (“[A] new field called ‘green building’ is gaining momentum.”).

112. Kibert, *supra* note 107, at 29.

113. See Hawes, *supra* note 3; see generally U.S. Environmental Protection Agency, Construction and Demolition Materials, <http://www.epa.gov/epaoswer/non-hw/debris-new/basic.htm> (last visited Mar. 16, 2009) (providing basic information on building related construction and demolition materials).

required for new construction, restoration or rehabilitation of an old building is a more efficient use of resources—and consequently, better for the environment—than new construction.¹¹⁴ Incorporating resource-efficient construction into historic preservation rehabilitation projects combats the resource consumption that plagues the construction industry while creating efficient buildings for future generations.

Energy efficiency, in particular “thermal performance,” is a challenge for older structures. Inefficient windows, insulation, heating and cooling equipment, and air leaks cause significant energy consumption and subsequently high energy bills.¹¹⁵ Although preservationists and architects are beginning to incorporate strategies to “achieve the greatest energy savings with the least alteration to the historic buildings,”¹¹⁶ restrictions on a number of the most efficient and cost-effective energy-saving techniques are deterring cross-the-board application of sustainable efforts to historic preservation.

Preservationists admit that the issue of window efficiency and replacement is among the most difficult issues of historic rehabilitation. Windows are the primary form of heat loss and energy waste in a structure.¹¹⁷ Not only is glass an ineffective thermal barrier and insulator, but inefficient windows leak air resulting in energy loss and higher utility bills.¹¹⁸ While preservationists provide advice for combating the energy loss and high utility cost of drafty old windows, they hold historic accuracy, materials, and aesthetics paramount to concerns of energy consumption, waste, and sustainability.

For example, a 1929 apartment building, which remained in continuing residential use, featured failing historic casement windows.¹¹⁹ Developers frequently replace existing historic windows during rehabilitation projects “for reasons of energy efficiency, ease of operation and maintenance.”¹²⁰ The owner of the 1929 apartment building intended to replace the deteriorating windows, simultaneously satisfying the project requirement

114. Hawes, *supra* note 3.

115. Energy Star, Common Home Problems and Solutions, http://www.energystar.gov/index.cfm?c=home_improvement.hm_improvement_solutions (last visited Mar. 16, 2009).

116. BAIRD M. SMITH, NAT'L PARK SERV., U.S. DEP'T OF INTERIOR, TECHNICAL BRIEF # 3: CONSERVING ENERGY IN HISTORIC BUILDINGS (1978), available at <http://www.nps.gov/history/hps/tps/briefs/brief03.htm>.

117. *Id.*

118. See generally *id.* (discussing the insulating properties of storm windows).

119. National Park Service, U.S. Department of the Interior, The REHAB YES & NO Learning Program: Topic Issue No. 3 (NO), <http://www.nps.gov/history/hps/rehabyes-no/rehabno3.htm> (last visited Mar. 16, 2008).

120. *Id.*

and the Standards for Rehabilitation.¹²¹ However, by replacing the historic windows with one-over-one double-hung windows, the local commission found the building no longer satisfied the Standards for Rehabilitation.¹²²

C. Criticism of the Current Standards for Rehabilitation

The 1929 apartment building example demonstrates the pitfalls of incorporating sustainable building practices into the current Secretary of the Interior's Standards for Rehabilitation. Local commissions reviewing the project can deny its qualification as certified rehabilitation for a certified historic structure,¹²³ denying the project preservation tax credits, or worse, denying the project altogether. Instead, recognizing the need to preserve resources and energy, local commissions and the Secretary of the Interior's Standards for Rehabilitation should consider efforts of sustainability when evaluating historic preservation rehabilitation projects. Additionally, encouraging adaptive reuse of structures, which preserves the historical aesthetics, is an economic and sustainable alternative to a strict Standards application.

While historic preservation generally has been regarded as an acceptable property restriction, some have criticized the movement as having "more to do with aesthetic snobbery than with preservation."¹²⁴ Additionally, many critics have raised a question which touches the main policy goals of preservation: should the building look old or new?¹²⁵ However, where sustainable building practices can be reconciled with the aesthetic ambitions (even where historic materials are replaced by sustainable substitutes) and intent of the original architects, the policy of reuse and preservation should be the ultimate goal.

Incorporating sustainable construction techniques into rehabilitation will result in an economical and environmental policy of adaptive reuse. The practice of adapting older or existing structures to accommodate new

121. *Id.*

122. *Id.* See 36 C.F.R. § 67.7(b)(6) (2008) ("Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinction feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.").

123. U.S. DEP'T OF THE INTERIOR, PRESERVATION TAX INCENTIVES FOR HISTORIC BUILDINGS 8 (2004).

124. Tipson, *supra* note 88, at 310. For an interesting discussion on the topic of "disneyfication" of history and the impact on local communities, see *id.* at 310–12.

125. James Marston Fitch, *On Formulating New Parameters for Preservation Policy*, in READINGS IN HISTORIC PRESERVATION: WHY? WHAT? HOW?, *supra* note 8, at 208.

purposes “is as old as civilization itself.”¹²⁶ The practices of pre-industrialized societies encouraged “use[] and reuse[]” until the structure or object lost its utility.¹²⁷ In fact, adaptive reuse was a principle form of energy conservation until the mid-nineteenth century.¹²⁸ By transforming existing structures into shops, restaurants, or offices, adaptive reuse provides an economic means of conserving energy and space while preserving the historic built environment.¹²⁹

Traditional building rehabilitation¹³⁰ is both an economic and resource-efficient policy. Financially, it costs less to rehabilitate an aging building than to construct a new one.¹³¹ Along with cost reduction, rehabilitation projects continue to provide the benefits of business and job stimulation, and downtown revitalization.¹³² In terms of resource efficiency, traditional building rehabilitation consumes less energy than new construction, according to studies by the Energy Research and Development Administration (ERDA) performed during the height of the preservation movement.¹³³ In addition to avoiding the landfill debris of building materials, rehabilitation results “in a net energy investment ‘savings’ over the expected life of the structures.”¹³⁴ Thus, resources are preserved since the energy required to prepare the building materials was consumed at the time of original construction.¹³⁵ By incorporating the practices of sustainable building, sustainable rehabilitation will increase the resource

126. FITCH, *supra* note 9, at 165.

127. *Id.* at 29. The policy of use and reuse is encompassed in Vermont’s Historic Preservation Act Rules, which states “the Vermont ethic: you don’t throw something away if it is still useful. It is good common sense in the fullest sense of the Vermont tradition to conserve, use, and improve what you already have. That is the spirit behind the Vermont CLG program and these regulations.” VT. HIST. PRES. ACT R. 3.1.2 (2001).

128. FITCH, *supra* note 9, at 165.

129. U.S. Advisory Council on Historic Preservation, *The Contribution of Historic Preservation to Urban Revitalization*, in READINGS IN HISTORIC PRESERVATION: WHY? WHAT? HOW?, *supra* note 8, at 75–76.

130. The phrase “traditional building rehabilitation,” as used in the text of this article, means building rehabilitation that has not incorporated the suggested sustainable building practices, which create “sustainable rehabilitation.”

131. Thomas D. Bever, *Economic Benefits of Historic Preservation*, in READINGS IN HISTORIC PRESERVATION: WHY? WHAT? HOW?, *supra* note 8, at 79.

132. *Id.*

133. *Id.* at 85. The U.S. Energy Research and Development Administration (ERDA) was established as an independent agency by the Energy Reorganization Act of 1974. The National Archives, Guide to Federal Records, <http://www.archives.gov/research/guide-fed-records/groups/430.html#430.1> (last visited Mar. 16, 2009). ERDA was abolished by the Department of Energy Organization Act of 1977, which combined ERDA and the Federal Energy Administration to form the U.S. Department of Energy. *Id.*

134. Bever, *supra* note 131, at 85.

135. *Id.* at 233.

efficiency of adaptive reuse, while preserving resources for future generations.

Practices of sustainable rehabilitation not only will increase the resource efficiency of existing buildings, but the cost savings of sustainable rehabilitation will address future energy and efficiency costs. This includes preserving energy and other resources, as well as reducing utility bills, by incorporating high-performance windows into rehabilitation projects.¹³⁶

Finally, the educational and aesthetic values of historic preservation can be preserved by sustainable rehabilitation. Aesthetics is the premiere significance of historic preservation. It is through aesthetics that “one experiences buildings with all one’s senses.”¹³⁷ Preserving aesthetics will satisfy the goals of education, recognition of the original architectural qualities, and understanding of the original community who participated in the creation of the structure’s built environment.

Use of sustainable construction materials, as opposed to requiring historic materials, is important to maximizing the sustainability of the historic structure. While replacing historic windows may alter the visual experience of the structure, this practice may in some circumstances serve economic and environmental goals, which will aid in long-term efficient preservation of a historic structure. Minimal alterations, in the name of sustainability, serve the environmental and resource-conservation-policy goals aimed at ensuring future generations’ access to resources and the benefits of the historic structures.

Some local communities have recognized the benefits of sustainable rehabilitation. For example, a regional government in Portland, Oregon remodeled a seventy-one year-old building using 100% recycled paint and recycled rubber floor tiles, in addition to salvaging carpet, hardwood flooring, doors, and fixtures.¹³⁸ While some local communities are actively incorporating sustainable rehabilitation into their historic preservation projects, the limits and requirements of the Standards for Rehabilitation serve as a barrier to widespread use of sustainable practices.¹³⁹

136. For a discussion on utility programs that offer incentives and rebates for energy-efficient windows see Efficient Windows Collaborative, <http://www.efficientwindows.org> (last visited Mar. 16, 2009).

137. Goldstone, *supra* note 59, at 146.

138. ENVTL. PROT. AGENCY, WASTE WISE UPDATE: BUILDING FOR THE FUTURE 11 (2002), available at <http://www.epa.gov/epawaste/partnerships/wastewise/pubs/wwupda16.pdf>.

139. Currently, a plan for “sustainable restoration” (see the definition section of this article for the distinction between restoration and rehabilitation) has been proposed for the Holy Cross Historic District and the Lower 9th Ward. SUSTAINABLE RESTORATION: HOLY CROSS HISTORIC DISTRICT & LOWER 9TH WARD 2 (2006), available at http://dnr.louisiana.gov/sec/execdiv/techasmt/programs/residential/holycrossneighborhood/HCN_RestorationPlan.pdf. Since Hurricane Katrina destroyed a

D. Solar Panels and Historic Structures

Solar panels present an area of zoning contention for historic structures. Their application is seen to violate a mantra of preservationists: preservation of the original architect's intent for the structure. However, in view of the increasing energy shortage, the need to conserve energy for future generations, and the cost-effective benefits, solar panel use has become an efficient way to achieve the goals of sustainability.¹⁴⁰ The communities that have encouraged zoning relaxation of solar panel-permit requirements have recognized the necessity to "balance the need for protecting the character of neighborhoods with the goal of encouraging the use of a renewable energy source."¹⁴¹ This is the critical issue facing historic preservation: the historic aesthetic must be considered in light of the need to incorporate sustainable rehabilitation practices. Solar panel installation will not only provide economic and energy efficiency, but will serve as a demonstration of a community's commitment to "environmental and social sustainability."¹⁴²

An example of a historic project which incorporated solar power is the Washington State Capital building.¹⁴³ Completed on January 5, 2005, the

significant portion of the Ward's circa-1880s building stock, the community is faced with the prospect of rebuilding both residential structures and non-residential historic landmarks—the Holy Cross High School, Jackson Barracks, St. Maurice Church, and "two unique Steamboat Houses." *Id.* at 25, 30, 39. The plan proposes a combination of restoration, rehabilitation, preservation, and reconstruction. *Id.* at 1. Additionally, the plan proposes energy efficiency and renewable energy by "explor[ing] the use of innovative energy technologies, including geothermal heating and cooling systems (GeoExchange), Passive Solar Engines, river and wind turbines and passive and active solar energy." *Id.* at 28. The environmentally-efficient proposals benefit from the unique situation of the 9th Ward: the need to reconstruct following a devastatingly destructive national disaster. *Id.* Since many of the project's proposals will require rebuilding, it will be easier to incorporate energy-efficient alternatives into the structures than if the 9th Ward had proposed to modify an unharmed, built environment.

140. Solar panels generate energy from light by using solar cells to appropriate photons, particles with an indefinitely long lifetime, whose energy is absorbed by the cells, which creates electricity. Kimberly Patch, *Cheap Solar Power on Deck*, TECH. RES. NEWS (Mar. 12–19, 2003), reprinted in TRN, MAKING THE FUTURE REPORT: THE STATE OF AN EMERGING TECHNOLOGY AND A LOOK AT WHAT LIES AHEAD (2003).

141. CITY OF SANTA-CRUZ, CAL., CITY COUNCIL AGENDA REPORT: PERMIT AND FEE REQUIREMENTS FOR SOLAR PANEL INSTALLATIONS (2001), available at <http://www.ci.santa-cruz.ca.us/cc/archives/01/2-13meeting/2-13rpt/solar.html> ("[Recommending] [t]hat the City Council provide direction to staff on amending the City's permit and fee requirements for installation of solar panels.").

142. Goska Romanowicz, *Solar Funding Lights up British Buildings*, EDIE, May 24, 2006, http://www.edie.net/NEWS/NEWS_STORY.ASP?ID=11504&CHANNEL=0 (reporting the granting of Government solar microgeneration funding in Britain by energy minister Malcolm Wicks).

143. Jim Erskine, *Solar Panels Installed on Washington State Capitol Building*, <http://www.solarwashington.org/articles/ofInterest/2005/PV-InstalledOnCapitolBuilding.htm> (last visited Mar. 16, 2009).

legislative building represents “the viability of renewable energy and [Washington State’s] commitment to environmental stewardship.”¹⁴⁴ Combining a concern for aesthetics with the need to incorporate energy and resource-saving practices, the project team is praised for locating the panels on the roof of the building’s fifth floor, maintaining the historic beauty of the exterior.¹⁴⁵ The Washington Capital building is illustrative of the goals of incorporating sustainable building practices into historic preservation efforts. While Washington State has embraced solar power, many states and local communities have not incorporated this technology into their environmental planning. The Northwest in particular is recognized “for being early adopters of . . . energy innovations, such as advanced wind turbines and efficient solar panels.”¹⁴⁶

“Environmentally harmful activity can be reduced (or environmentally benign activity can be increased) by changing the incentives of people and businesses through the use of taxes, subsidies . . . and liability.”¹⁴⁷ In historic preservation, modifying the Secretary of the Interior’s Standards for Rehabilitation can increase sustainable rehabilitation and thus provide both an incentive for sustainable practices and ease of application. Although local communities will retain the right to pass zoning ordinances and other property restrictions for historic preservation, the widespread use of the Standards as guidelines to the local commissions, and the required satisfaction of the Standards’ criteria for preservation tax incentives, will motivate local communities to incorporate sustainable rehabilitation into their local ordinances. Thus, the proposed Standards, which incorporate incentives and refrain from discouraging sustainable rehabilitation as an umbrella policy goal, will filter through the multitiered system of historic

144. *Id.*

145. Washington State’s Capital building solar panels save energy through the following process: “The panels won’t directly supply electricity to any lights at the Capitol. Instead, the solar-generated energy will be fed into the power grid. The power reduced by the solar array offsets the electricity purchased to run the lights in the dome and lantern.” *Id.*

146. Renewable Energy World.com, Clean Energy Bill Movement in Washington State: Interconnection Standards and Alternative Fuels Legislation on the Move (Mar. 9, 2005), http://www.renewableenergyaccess.com/rea/news/story;jsessionid=aKAG4HLx6OG_?id=23526 (“A bill sponsored by [the] Technology, Energy and Communications chair . . . paves the way for Washington State to become a premier hub for testing and deploying new energy technologies in North America by standardizing the many interconnection standards in the state.”). Solar panels are to the built environment what wind turbines are to the natural environment: an aesthetic alteration that generates efficient energy and resource preservation, but is highly contested for its impact on a viewer’s visual perception. For a discussion on the aesthetic debate on wind turbines in Vermont, see Candace Page, *Hearings Begin over Wind Energy*, BURLINGTON FREE PRESS, Mar. 15, 2005, at 1B.

147. STEVEN C. HACKETT, ENVIRONMENTAL AND NATURAL RESOURCE ECONOMICS: THEORY, POLICY, AND THE SUSTAINABLE SOCIETY 3 (2006).

preservation legislation to the state and local levels encouraging sustainable rehabilitation.

CONCLUSION

There exists a global and national concern for the stock of our natural resources.¹⁴⁸ The concern for resource stock leads some to prophesize that the competition for control of natural resources will be the leading impetus for conflict in the twenty-first century.¹⁴⁹ With the imperative need to incorporate green and sustainable design into both new construction and the existing built environment, preservationists, architects, and the multitier players of historic preservation must make every reasonable effort to reduce buildings' energy and resource requirements. By reducing building debris and encouraging adaptive reuse, sustainable rehabilitation will ensure both resource and historic preservation for future generations through enhanced thermal efficiency, incorporating recycled or renewable building materials, and, expectantly, solar power.

148. MANAGING NATURAL RESOURCES FOR SUSTAINABLE LIVELIHOODS: UNITED SCIENCE AND PARTICIPATION 3 (Barry Pound et al. eds., 2003).

149. For a discussion on the link between global conflict, natural resources, and poverty, famine, and disaster, see *id.*