How Buildings Will Save the World: Using Building Energy Regulation and Energy Use Disclosure Requirements to Target Greenhouse Gas Emissions

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There is a legal, ethical, and pragmatic case for regulation aimed at reducing greenhouse gas emissions in the United States. An essential part of that scheme is the regulation of energy use in the building sector, which accounts for a third of American green house gas emissions. Some regulation in this area is already in place. But largely local efforts have resulted in inconsistent rules that vary in effectiveness and compromise not only the staggering potential for emission reduction, but also the commercial opportunity and prospective consumer cost savings available. This Note examines the current strategy of state building energy codes along with the feasibility of universal adoption. It also looks at the potential of a new market-based approach of mandated building energy use disclosures that could represent an attractive accompanying or alternate solution to the current codes.

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Introduction

Every American president since Richard Nixon has claimed that energy policy is a crucial issue facing this country.[1] The two most cited issues driving the conversation have been the national security interest in eliminating dependence on foreign energy supplies and mitigating the environmental damage from energy use.[2] Vehicles for reaching those twin goals take myriad forms, from policies that encourage domestic oil exploration and production[3] to tightened efficiency standards.[4]

Recent increases in domestic production of shale oil and natural gas have transformed the notion of American energy independence from a political slogan to a realistic prediction.[5] Natural gas may have a net gain in its potential to decrease American reliance on coal, but natural gas is

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1. *The Daily Show with Jon Stewart: An Energy-Independent Future* (Comedy Central television broadcast June 16, 2010), *available at* http://www.thedailyshow.com/watch/wed-june-16-2010/an-energy-independent-future.

2. *See, e.g.*, President Richard Nixon, A Special Message to the Congress on Energy Policy (Apr. 18, 1973), *available at* http://www.presidency.ucsb.edu/ws/?pid=3817.

3. *See, e.g.*, Michael Abramowitz & Juliet Eilperin, *Bush Calls for Offshore Oil-Drilling*, Wash. Post, June 19, 2008, at A1.

4. *See, e.g.*, Sec. Ray Lahood, *Historic Fuel Efficiency Standards for Cars and Light Trucks*, White House Blog (Aug. 28, 2012), http://www.whitehouse.gov/blog/2012/08/28/historic-fuel-efficiency-standards-cars-and-light-trucks.

5. "The U.S. will surpass Russia and Saudi Arabia as the world's top oil producer by 2015, and be close to energy self-sufficiency in the next two decades, amid booming output from shale formations, the IEA said." Grant Smith, *U.S. to Be Top Oil Producer by 2015 on Shale, IEA Says*, Bloomberg (Nov. 12, 2013, 8:47 AM), http://www.Bloomberg.com/news/2013-11-12/u-s-nears-energy-independence-by-2035-on-shale-boom-iea-says.html.

still a fossil fuel with sizable carbon content. Moreover, newly tapped sources of shale oil have an exponentially greater greenhouse gas ("GHG") emission potential than conventional oil.[6] It is perhaps unsurprising that the environmental impacts of fossil fuels have taken a central role in the American conversation about energy use.[7]

As President Obama stated during his announcement of a national climate change plan, "Americans across the country are already paying the price of inaction."[8] These effects include extreme weather events, flooding, and changes in precipitation patterns.[9] In addition to the humanitarian costs, extreme weather events cost hundreds of billions of dollars per year, and that amount is climbing.[10]

The focus on cost savings as a motivation for integrating sustainable practices underscores an aspect of the issue that drives energy policy as much as any other factor: consumers like cheap energy.[11] When President Obama introduced his plan to tackle GHG emissions, he cited consumer costs almost as many times as climate change.[12] The message is clear: the ideal energy policy reduces emissions at a net-zero cost.

There is no free lunch, of course. In any transaction, costs accrue to a producer and are paid by a consumer. But in the context of building energy, the argument can be made that investment in efficiency shifts the spending away from energy use (with its associated foreign dependence[13]

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6. *Plenty of Shale, Plenty of Problems*, WORLDWATCH INST., http://www.worldwatch.org/node/5167 (last visited Feb. 2, 2015).

7. *See, e.g.*, President Barack Obama, Speech on Climate Change (June 25, 2013), http://www.climatecentral.org/news/text-of-president-obamas-speech-on-climate-action-plan-16158; Mark Landler & John Broder, *Obama Outlines Ambitious Plan to Cut GHGes*, N.Y. TIMES, June 25, 2013, at A17; Press Release, Office of the Press Sec'y for the President of the U.S., President Obama Sets GHG Emissions Reduction Target for Federal Operations (Jan. 29, 2010), http://www.whitehouse.gov/the-press-office/president-obama-sets-greenhouse-gas-emissions-reduction-target-federal-operations.

8. Landler & Broder, *supra* note 7.

9. David Biello, *Climate Change Will Bring More Extreme Precipitation and Floods*, SCI. AM., May 3, 2011, at 16.

10. *See, e.g.*, Nina Chetney, *Losses from Extreme Weather Rise to $200 Billion a Year Over Past Decade*, YAHOO NEWS (Nov. 18, 2013, 8:20 AM), http://news.yahoo.com/losses-extreme-weather-rise-200-billion-over-past-130504043--business.html; Michael Muskal, *Superstorm Sandy Recovery, Struggles Continue One Year Later*, L.A. TIMES (Oct. 28, 2013), http://www.latimes.com/nation/nationnow/la-na-nn-superstorm-sandy-anniversary-20131028,0,5628105.story#ixzz2lFFeFLIl (estimating the financial cost of Hurricane Sandy at $65 billion).

11. *See* SHEILA BONINI & STEPHAN GÖRNER, THE BUSINESS OF SUSTAINABILITY: MCKINSEY'S GLOBAL SURVEY RESULTS (2011), *available at* http://www.mckinsey.com/insights/energy_resources_materials/the_business_of_sustainability_mckinsey_global_survey_results.

12. President Barack Obama, Speech on Climate Change, *supra* note 7.

13. Building energy from electricity is less of a factor in the issue of foreign dependence than, for example, transportation. U.S. electricity is generated from sixty-six percent fossil fuel sources, but about two-thirds of that generation comes from coal, of which the United States is a net exporter. *ELECTRICITY IN THE UNITED STATES*, U.S. ENERGY INFO. ADMIN., http://www.eia.gov/energyexplained/index.cfm?page=electricity_in_the_united_states (last updated Aug. 12, 2014); *ENERGY IN BRIEF: WHAT*

and gas emissions[14]) and into the value of the building itself. It substitutes an investment for a utility cost with no net gain in expense.[15] As such, the regulation of building energy use may be a means to make significant gains on the policy goals of reducing overall energy use and GHG emissions at little or no overall cost to energy consumers.

The potential of building energy reduction is dramatic. For example, in 2010, the worldwide building energy sector accounted for 32 of final energy use and 8.8 gigatons of CO_2 emissions ("$GtCO_2$").[16] In the United States, buildings annually account for approximately 39 of the country's total GHG emissions from fossil fuel combustion.[17] The United States accounts for a little less than 20 of worldwide GHG emissions,[18] which means that approximately 8 of the total worldwide GHG emissions are directly attributable to the energy use of American buildings.

This Note argues that regulating building energy use is highly desirable and examines possible mechanisms for doing so. While this Note is by no means exhaustive, it examines the current state of building energy regulation—primarily state building codes—and compares the current scheme with the emergence of mandated energy use disclosures. This Note identifies some of the weaknesses of such disclosure programs and proposes a possible solution.

Part I looks briefly at the case for regulating building energy use, using the lens of GHG emission reduction goals. Part II looks at the current state of regulation and building energy codes, and examines the feasibility of expanding the current regulatory regime to a universal

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Is the Role of Coal in the United States?, U.S. Energy Info. Admin., http://www.eia.gov/energy_in_brief/ article/role_coal_us.cfm (last updated June 2, 2014). However, coal fired power plants have the highest GHG emission intensity of any power source, making reductions in the country's electricity demands a powerful tool for GHG emission reduction. World Nuclear Ass'n, Comparison of Lifecycle GHG Emissions of Various Electricity Generation Sources 6–7 (2011). Furthermore, the national heating fuel mix is about half natural gas, of which twelve percent is foreign sourced and includes a significant percentage of foreign sourced fuel oil. *About Natural Gas*, Am. Gas Ass'n, http://www.aga.org/Kc/aboutnaturalgas/Pages/default.aspx (last visited Feb. 2, 2015); *Today in Energy*, U.S. Energy Info. Admin. (Oct. 28, 2011), http://www.eia.gov/todayinenergy/detail.cfm?id=3690.

14. 6.89551×10^{-4} metric tons CO_2 / kWh. *Clean Energy, Calculations and References*, U.S. Envtl. Prot. Agency, http://www.epa.gov/cleanenergy/energy-resources/refs.html (last updated Sept. 9, 2014) (based on data from 2010).

15. *See, e.g.*, U.S. Envtl. Prot. Agency, Energy Efficiency: Reduce Energy Bills, Protect the Environment (2013), *available at* http://www.epa.gov/cleanenergy/documents/suca/consumer_fact_sheet.pdf.

16. Intergovernmental Panel on Climate Change, Climate Change 2014: Summary for Policymakers: Mitigation of Climate Change: Contribution of Working Group III 23 (Ottmar Edenhofer et al. eds., 2014).

17. U.S. Dep't of State, United States Climate Action Report 2014, at 11 (2014); *EPA Green Buildings*, U.S. Envtl. Prot. Agency, http://www.epa.gov/oaintrnt/projects (last updated Sept. 10, 2013). These statistics do not include a further thirty percent of raw material use, as well as thirty percent of waste output and twenty percent of potable water use. *Id.*

18. *Each Country's Share of CO2 Emissions*, Union of Concerned Scientists (Aug. 20, 2010), http://www.ucsusa.org/global_warming/science_and_impacts/science/each-countrys-share-of-co2.html.

adoption of the code. Part III looks at the newly emerged alternative to regulating building energy: building energy use disclosure requirements that have been enacted in two states and nine cities.[19]

This Note also argues that building energy codes represent the most common means of reducing overall building energy use, and the potential in these codes is clear and significant. Nationwide implementation of the most recent code standards would reduce green house gas emissions from buildings by an average of twenty percent and consumer energy costs by an average of twenty-two percent.[20] However, building energy codes are traditionally left to state regulation, and there are varying levels of acceptance and implementation. A national, progressive building energy code is an attractive alternative to a GHG reduction policy, but as will be discussed, several factors make a national code unattractive from a political and pragmatic perspective. As a result, a national code is unlikely to be implemented. Efforts to expand implementation should proceed at the state and local level and will likely meet with mixed results.

Energy use disclosure requirements represent an interesting development in the regulation of building energy use. This Note suggests that such disclosures may be an attractive supplement to, or even an alternative for, building energy codes. However, to date, these regulations suffer from weak enforcement, and there is little incentive for a property owner to follow them.[21] Therefore, this Note also recommends enforcement of disclosure provisions by means of a private

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19. *U.S. Policy Briefs*, BUILDINGRATING.ORG, http://legacy.buildingrating.org/content/us-policy-briefs (last visited Feb. 2, 2015).

20. JOSHUA KNEIFEL, NAT'L INST. OF STANDARDS AND TECH., U.S. DEP'T OF COMMERCE, SPECIAL PUB. 1147, BENEFITS AND COSTS OF ENERGY STANDARD ADOPTION IN NEW COMMERCIAL BUILDINGS 141 (2013), *available at* http://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.1147.pdf.

21. *See, e.g.*, California's disclosure requirement, created by Assembly Bill 1103 has no civil enforcement provision. Assemb. B. 1103, 2007–08 Leg., Reg. Sess. (Cal. 2007). Furthermore Section 1, subdivision (e) of Assembly Bill 531 makes explicit that the disclosure requirement does not impose any new duties on sellers or brokers, which would seem to preclude enforcement by private parties. Assemb. B. 531, 2009–10 Leg., Reg. Sess. (Cal. 2009). By contrast, New York City's Local Law 84, which provides for a civil fine of $500 per quarter, is relatively strict. *NYC Local Law 84 Violations & Fines*, NYC BENCHMARK, http://www.NYCBenchmark.com/local-law-84-violation (last visited Feb. 2, 2015). To put that number into perspective, New York commercial buildings subject to the requirement face property tax of 10.612 of assessed value. With an average per square foot cost of $703, a very modest commercial building in Manhattan (say 8,000 square feet) has a market value of nearly $6,000,000 and a property tax bill of nearly $286,000 in addition to New York's commercial rent tax. A $2,000 fine is a drop in the bucket for a property owner who wishes to avoid disclosure. *See* Rosemary Scanlon & Hope Cohen, *Assessing NYC's Property Tax—Yet Again*, MANHATTAN INST., CTR. FOR RETHINKING DEV. (Mar.–Apr. 2009), http://www.manhattan-institute.org/email/crd_newsletter04-09.html; Richard Persichetti, *Throughout Manhattan, Price per Square Foot Spiked in 1Q13*, COMMERCIAL OBSERVER (May 12, 2013, 9:49 PM), http://commercialobserver.com/2013/05/throughout-manhattan-price-per-square-foot-spiked-this-year; *Determining Your Assessed Value*, N.Y.C. FIN., http://www.nyc.gov/html/dof/html/property/property_val_assessment.shtml (last visited Feb. 2, 2015).

right of action for material nondisclosure. Additionally, general disclosure requirements may represent one of the few areas in building energy in which there is the potential for regulation at the federal level.

Together, widespread adoption of an updated building energy code and building energy disclosure requirements have the potential to significantly reduce the nation's carbon impact. These regulations are also one of the few regulatory areas where there has been a receptive audience in both the consumer market and the regulated industry. This acceptance comes from the recognition that building energy regulation can be implemented without significant consumer cost increase and can, in fact, result in overall cost reductions. Furthermore, while these regulations work best together, they appeal to different political philosophies and can be implemented separately or balanced to reflect regional politics. Building energy regulation offers extraordinary opportunity for reduction of GHG emissions, and serious efforts should be directed towards their more universal enactment.

I. The Case for Regulating Building Energy

Regulation of GHG emissions exists at both the state and national level. Even without a legal mandate, there is a case for regulation on ethical and pragmatic grounds. While this Note does not address the broad topic of why and by whom GHG emissions should be regulated, GHG emission regulation is the foundation on which building energy regulation rests. To that end, the first Subpart of Part I will briefly set forth the legal framework that regulates GHG emissions at the state and national level. The second Subpart will demonstrate that tackling building energy use is a crucial component in any serious effort to curb GHG emissions.

A. Regulation of GHG Emissions

State and local governments have largely led the charge for regulating GHG emissions. Political calculations have led to some local action,[22] but since states also bear the financial costs for responding to the impacts of climate change, there is a practical motivation for states to act as well.[23] Their sovereign territories are, and continue to be, affected by sea level rise and increased storm events.[24] For many years, states bore this burden in the absence of a federal response.

However, since carbon emissions and climate change are, by definition, nonlocal problems, it is unclear that states can successfully

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22. Kristen Engel & Barak Orbach, *Micro-Motives and State and Local Climate Change Initiatives*, 2 Harv. L. & Pol'y Rev. 119, 129 (2008).

23. *See* Massachusetts v. Envtl. Prot. Agency, 549 U.S. 497, 522–23 (2007).

24. *Id.* at 519.

confront climate change unilaterally. Arguably, any state regulation of GHG emissions, in the absence of a broader agreement, is a futile policy. The ineffectual nature of unilateral policies is compounded by the concept of leakage, that is, businesses fleeing across state borders to states with lighter regulations. Leakage still impacts the state's climate change threats without providing the economic benefits of the business.[25] Although a state may be motivated to act on its own, universal or federal action may be required to truly effect change.

Despite the threat of business leakage, twenty-nine states have enacted some form of emissions tracking or reduction legislation, and fourteen of those states have hard reduction targets with timelines for compliance.[26] Additionally, regional agreements to reduce GHG emissions exist through the Western Climate Initiative on the West Coast,[27] and the Regional Green House Gas Initiative in the Northeast and Mid-Atlantic.[28]

Half of those states require that some percentage of their energy generation be sourced from renewable sources.[29] However, an approach that focuses solely on the supply of energy will never be sufficient to level or reduce the emissions of GHGs.[30] As such, states with emission reduction plans have also mandated demand-side reductions, even as they plan for an increased population and an expanding economy.[31] Demand reductions center on reducing energy consumption, and therefore overall emissions, through efficiency. To achieve this end, reductions in building energy use play an important role.[32]

State action began in the face of a virtual federal void.[33] Prior to *Massachusetts v. Environmental Protection Agency*, the Environmental

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25. *See, e.g.*, *Fact Sheet: Why Do We Want to Suspend AB 32?*, SUSPENDAB32.ORG, http://www.SuspendAB32.org/AB32FactSheet.pdf (last updated May 2010) (warning of business flight to neighboring states).

26. Engel & Orbach, *supra* note 22, at 123.

27. *See* Andrew Garber, *3 States, B.C. Craft Climate Accord*, SEATTLE TIMES (Oct. 28, 2013, 9:23 PM), http://seattletimes.com/html/localnews/2022143977_climategovernorsxml.html (announcing an agreement to "account for the costs of carbon pollution," including a cap and trade program or tax on carbon between California, Oregon, Washington, and British Columbia).

28. *See RGGI, Inc.*, REG'L GREENHOUSE GAS INITIATIVE, www.rggi.org (last visited Feb. 2, 2015) (providing a regulatory market-based program to reduce GHG emissions in Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont).

29. Engel & Orbach, *supra* note 22, at 124.

30. *See, e.g.*, Yvonne Y. Deng et al., *Transition to a Fully Sustainable Global Energy System*, 1 ENERGY STRATEGY REV. 109, 111 (2012) ("Policy measures are necessary in all sectors . . . those driving efficiency and power grids are crucial.").

31. *See, e.g.*, CAL. AIR RES. BD., CLIMATE CHANGE SCOPING PLAN 30–67 (2008), *available at* http://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm (providing emission reduction measures to include increased energy efficiency standards).

32. *Id.* at 41–44 (outlining energy efficiency goals for new and existing buildings).

33. Naomi Wolf, *America's Drought of Political Will on Climate Change*, GUARDIAN (Aug. 8, 2012, 1:50 PM), http://www.theguardian.com/commentisfree/2012/aug/08/america-drought-political-will-climate-change.

Protection Agency ("EPA") declined to set any standards for GHG emissions, waiting instead for the establishment of an "unequivocal link" between human activity, GHG emissions, and climate warming.[34] The federal government held this position despite widely accepted evidence showing that GHG emissions were substantially the result of human activity and a primary contributing factor to climate change and its accompanying dangers.[35]

Following the Supreme Court's 2007 decision, the EPA published a finding that GHG emissions from vehicles are "reasonably anticipated to endanger public health and welfare" under section 202(a) of the Clean Air Act.[36] The endangerment finding itself imposed no burdens on the industry or consumers, but it required the EPA to promulgate standards for GHG emissions vehicles.[37] With the finding in place, the EPA also instituted a wider series of regulations targeting GHG emissions from new stationary sources, that is, power generators and some industrial sources, and the agency began outreach to states in an effort to curb emissions from existing sources.[38]

Federal efforts to curb energy demand exist. But the federal politics include calculation of pollution *and* attempts to address energy independence. As a result, these efforts have historically been far more robust in transportation (that is, foreign oil) than power generation (that is, domestic coal). Corporate average fuel economy[39] standards, for example, are essentially mandatory regulations on the demand of energy because they curb energy consumption and emissions by mandating efficiency standards for consumer goods, such as cars and light trucks.[40]

By contrast, efforts to address electricity usage have been largely voluntary and incentive based. The Department of Energy sets efficiency standards for consumer appliances and manufactured housing,[41] but has done little else to reduce general electricity consumption. Similarly,

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34. Massachusetts v. Envtl. Prot. Agency, 549 U.S. 497, 512–13 (2007).

35. *Id.* at 508–09 (citation omitted).

36. Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66,496, 66,499 (Dec. 15, 2009) (to be codified at 40 C.F.R. ch.1).

37. *Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act*, ENVTL. PROT. AGENCY, http://www.epa.gov/climatechange/endangerment/index.html (last updated Nov. 22, 2013).

38. Press Release, Envtl. Prot. Agency, EPA Proposes Carbon Pollution Standards for New Power Plants (Sept. 20, 2013), *available at* http://yosemite.epa.gov/opa/admpress.nsf/0/da9640577ceacd9f85257beb006cb2b6.

39. *Corporate Average Fuel Economy*, NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., http://www.nhtsa.gov/fuel-economy (last visited Feb. 2, 2015).

40. Light-Duty Vehicle GHG Emission Standards and Corporate Average Fuel Economy Standards, 88 Fed. Reg. 25,324 (May 7, 2010) (to be codified in scattered sections of 40 C.F.R. and 49 C.F.R.) ("EPA and NHTSA are issuing this joint Final Rule to establish a National Program consisting of new standards for light-duty vehicles that will reduce greenhouse gas emissions and improve fuel economy.").

41. *See* Energy Independence and Security Act of 2007, Pub. L. No. 110-140, 121 Stat. 1492.

President Obama's Climate Action Plan calls for expanding measures aimed at increasing voluntary investment, such as low interest loans and tax credits for energy efficient buildings.[42] The President's plan also highlights efficiency mandates for federal buildings,[43] but it sets forth no new actual curbs on the general consumption of electricity.

B. Why Building Energy?

While regulatory efforts to curb consumption of energy receive varying levels of attention, any serious effort to reduce GHG emissions must consider reducing energy use as a part of the equation.[44] Increasing building efficiency is a relatively easy goal to achieve and has the potential to produce impressive reductions in energy consumption.

In their 2004 paper, *Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies*, Stephen Pacala and Robert Socolow identified a nonexhaustive list of fifteen sectors that could be adapted using existing technology to help stabilize the increase of GHG emissions.[45] Each sector, they posit, has the potential to adapt from "business as usual" to a stabilization wedge that would reduce emissions by one $GtCO_2$ per year with known and established approaches.[46] Any seven of these wedges combined would be enough to level off the worldwide increase of carbon emissions.[47] For the building sector to qualify as a stabilization wedge, Pacala and Socolow proposed that worldwide building stock must cut its net carbon emissions by 25 overall by 2054.[48]

In the United States, buildings account for 36 of total energy usage, 65 of total electricity usage, and 30 of the United States' total GHG emissions.[49] The United States accounts for a little less than 20 of worldwide GHG emissions,[50] which means that approximately 8 of the total worldwide GHG emissions are directly attributable to the energy use of American buildings. It is also important to note that, once built, buildings continue to emit GHG emission at largely the same rate for a long time. Most buildings last for thirty to fifty years and, while updates

42. Exec. Office of the President, President's Climate Action Plan 9 (2013), *available at* http://www.whitehouse.gov/sites/default/files/image/president27sclimateactionplan.pdf.

43. *Id.* at 11.

44. Deng et al., *supra* note 30, at 111.

45. *See generally* Stephen Pacala & Robert Socolow, *Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies*, 305 Sci. 968 (2004).

46. *Id.* at 968–69.

47. *Id.* at 968.

48. *Id.* at 970.

49. *EPA Green Buildings*, *supra* note 17.

50. *Each Country's Share of CO2 Emissions*, *supra* note 18.

and remodels are possible, much of a building's energy consumption and footprint is determined by initial design and construction.[51]

What is remarkable about the building energy wedge is that Pacala and Socolow's goal of 25 energy use reduction is not only *realistic* in this country, but it is a goal that can and is commonly surpassed by high-performance, efficient buildings. Contemporary buildings are generally designed to be more than 25 more efficient than their 2004 (the year of Pacala and Socolow's paper) counterparts, and a number of organizations advocate that it is realistic to move U.S. building stock towards net-zero GHG emissions using existing technology.[52] This development is already underway in certain communities and actual net-zero buildings are increasingly becoming a reality.[53]

The U.S. Green Building Council[54] introduced their Leadership in Environmental and Environmental Design ("LEED") building certification system in 2000 with the goal of promoting sustainable energy efficient building design.[55] The core premise of the LEED system is voluntary certification of buildings gained by earning points in five credit categories: indoor environmental quality, materials and resources, water efficiency, sustainable sites, and energy and atmosphere.[56] Reflective of an overall emphasis on energy consumption and reduction in GHG emissions, each category touches on energy use.[57] The primary category to consider energy use is energy and atmosphere, which also provides the most potential points towards certification (35 of 100 possible base points).[58]

The energy and atmosphere category uses Standard 90.1-2004, a model Building Energy Code promulgated by the American Society of

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51. Meredyyd Evans et al., Pac. Nw. Nat'l Lab., Shaping the Energy Efficiency of New Buildings 7 (2009).

52. *Id.*

53. *See Buildings Database*, New Buildings Inst., http://newbuildings.org/net-zero-living-building-challenge-financial-study (last visited Feb. 2, 2015).

54. Active since 1993, the U.S. Green Building Council is a nonprofit, nongovernmental organization dedicated to promoting and advancing efficient and sustainable design in the building sector. *About USGBC*, U.S. Green Building Council, http://www.usgbc.org/about (last visited Feb. 2, 2015).

55. *USGBC History*, U.S. Green Building Council, http://www.usgbc.org/about/history (last visited Feb. 2, 2015).

56. *LEED Rating System*, U.S. Green Building Council, http://www.usgbc.org/leed/rating-systems (last visited Feb. 2, 2015).

57. For example, points are available under the "materials and resources" category for using locally sourced materials during construction, following the idea that locally produced products use less energy in transportation to the building site. Similarly, reflective roofs earn points under the sustainable site category, based on the theory that absorbing less heat through roofs lowers the building's cooling load and, through mitigating the "heat island" effect of concentrated areas of heat absorbing roofs, lowers the cooling load of the entire region. U.S. Green Building Council, LEED 2009 for New Construction and Major Renovations 17, 19 (2008), *available at* http://www.usgbc.org/sites/default/files/LEED 202009 20RS_NC_10-2013_1b.pdf.

58. *Id.* at iv.

Heating, Refrigeration, and Air-Conditioning Engineers ("ASHRAE"), as a baseline standard.[59] In order to earn certification, LEED buildings must be at least 14 more efficient than ASHRAE 90.1-2004.[60] Increased points are earned by following prescriptive advanced energy design paths (meeting stricter ASHRAE standards from subsequent iterations, that is, 2007 or 2010), or through energy calculations and simulations that show that the building is designed to be a certain percentage more efficient than the baseline.[61]

To understand the potential for reduction in these numbers, consider the following: a gain of 14 building efficiency from the 2004 guidelines, broadly applied to new construction in the United States, could reduce primary energy use in buildings by about 0.25 quadrillion Btu per year by 2015 and 1.75 quadrillion Btu per year by 2030.[62] That reduction is equivalent to the power generated by 130 medium-sized (450 MW) power plants.[63] Furthermore, the LEED standards are a floor. Many certification seekers use the efficiency and alternative generation recommendations to create buildings that are far more efficient than the guidelines, often gaining net-zero energy use.[64]

After recognizing the success and efficiency of LEED-influenced design and its potential influence as a significant consumer entering the marketplace, the federal government adopted LEED's most progressive high-performance standards for the construction and renovation of all federal buildings.[65] The energy code currently employed for federal buildings is a LEED equivalent and includes a mandate that all new federal buildings, beginning in 2020, achieve net-zero energy use by 2030.[66]

The reasoning is clear for the federal government. They are a long-term user of the buildings and emphasize quality of construction over up-front costs.[67] This attitude is reflected in the Federal Acquisition Regulations for buildings, which direct the government to obtain the best

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59. *Id.* at 33. While it is unclear what Pacala and Socolow considered as the baseline of worldwide average energy use of buildings, model codes are designed to be more efficient than the existing standard practices.

60. *Id.* at 37.

61. *Id.* at 37–38.

62. *See* U.S. DEP'T OF ENERGY, BUILDING ENERGY CODES 101: AN INTRODUCTION 3 (2010), *available at* https://www.energycodes.gov/sites/default/files/documents/BECP_Building 20Energy 20Codes 20101_February2010_v00.pdf [hereinafter U.S. DEP'T OF ENERGY, BUILDING ENERGY CODES 101].

63. *Id.*

64. "By the purest definition, a net-zero building produces all the renewable energy it needs on site, drawing no more power from the grid than it gives back." Lacey Johnson & ClimateWire, *Net-Zero Energy Buildings Take Hold in U.S.*, SCI. AM. (Mar. 7, 2012), http://www.scientificamerican.com/article/net-zero-energy-buildings-in-us.

65. Patrick E. Tolan, Jr., *Going-Going-Green: Strategies for Fostering Sustainable New Federal Buildings*, 41 PUB. CONT. L.J. 233, 244–45 (2012).

66. *Id.* at 254–55; Exec. Order No. 13,514, 74 Fed. Reg. 52,117 (Oct. 5, 2009).

67. Tolan, *supra* note 65, at 282.

"value" for architecture and engineering services as opposed to the best cost.[68] Through energy efficient, high-performance building design, the federal government has an opportunity to save on long-term energy costs, reduce reliance on foreign energy sources, and reduce carbon emissions.[69] It is one of the few areas of energy policy that produces benefits and unites both sides of the political aisle.[70]

While LEED and the federal government represent a small percentage of the overall building sector, the potential for this design paradigm to expand broadly is realistic. Innovations like on-site power generation and green roofs catch the public eye, but the primary *technology* of high-performance buildings is simply the implementation of good building practices.[71] These practices include the careful application of low-tech and low-cost solutions, such as alternative framing techniques, good insulation, and sealing off air infiltration.[72] Most importantly, it also includes "right-sizing" the design of lighting, heating, ventilation, and air conditioning.[73] Right-sizing is the process of making energy-efficient choices during the design of a building and calculating for the actual predicted use of the building, as opposed to designing for a hypothetical but "safe" use far in excess of the actual predicted use.[74] Right-sizing has the benefit of reducing the size and impact of mechanical systems installed to condition the space.[75]

There is increasing recognition that these efficiency goals are achievable in the private sector. Architecture2030, an advocacy organization started in 2002 by a New Mexico architect named Ed Mazria,[76] posits that by 2035, seventy-five percent of the built environment in the United States will be either new construction or substantially renovated.[77] Based on that statistic, Architecture2030 advocates for an aggressive redesign of the way these structure are built.[78]

68. *Id.*

69. *Id.* at 262.

70. *Id.* at 262–63.

71. *See* Michelle Desidario, *7 Best Practices for Building Affordable Green Homes*, NAT'L ASS'N OF HOME BUILDERS (Feb. 20, 2011), http://www.probuilder.com/7-best-practices-building-affordable-green-homes.

72. *Id.*; MISS. DEV. AUTHORITY, BUILDING ENERGY CODE FACTSHEET: COMMERCIAL ENERGY CODES BUILD A BETTER BOTTOM LINE 2 (2010).

73. Tolan, *supra* note 65, at 265–66.

74. *Id.* Anyone who has sat in a freezing cold auditorium has felt the impact of an over-sized mechanical system designed for maximum hypothetical occupancy, as opposed to ordinary predicted usage.

75. *Id.*

76. *About Us*, ARCHITECTURE2030, http://architecture2030.org/about/about_us (last visited Feb. 2, 2015).

77. *A Historic Opportunity*, ARCHITECTURE2030, http://architecture2030.org/the_solution/buildings_solution_how (last visited Feb. 2, 2015).

78. *Energy: The Building Sector Must Lead*, ARCHITECTURE2030, http://architecture2030.org/the_solution/solution_energy (last visited Feb. 2, 2015).

Architecture2030 sets two goals: (1) that all new construction and an equal amount of remodeled building stock will be seventy percent below the regional average of energy usage by 2015 and (2) that efficiency standards will increase incrementally, until all new buildings and remodels in the United States are carbon neutral by 2030, which would be achieved primarily through efficient design and on-site generation of energy.[79] Increasing adoption of these performance goals by the design industry demonstrates that the projections are realistic.[80] Moreover, the American Institute of Architects, the American Institute of Interior Designers, ASHRAE, the National Governor's Association, the U.S. Conference of Mayors, and a significant number of national home builders and general contractors currently endorse these goals.[81]

Beyond the potential reduction of emissions, though, the building efficiency wedge's particular attraction is that the cost is one that consumers actually *want* to pay. Builders and developers have recognized that building efficient buildings is good business.[82] It makes intuitive sense that a building owner would pay up front in order to achieve long-term savings. From an economic perspective, efficiency is a simple up-front investment with the understanding that cost of operations, that is, energy costs, will decrease in the long term. In a rational world, any time the long-term savings of efficiency (discounted to present value) are greater than the short term up-front costs of efficiency, the investment would be attractive in order to maximize the capital. Educated consumers recognize that the higher up-front costs of efficiency are worthwhile investments that will pay back over the life of the building, and thus they are willing to pay more for efficiency.[83]

There are broader economic and policy benefits to promoting building efficiency as well. The "work" of building efficiency is carried out primarily by the building industry, which employs nearly six million people in construction alone.[84] Design and engineering fields employ more individuals, and the industry expects that green building will grow

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79. *Adopters*, ARCHITECTURE2030, http://architecture2030.org/2030_challenge/adopters_firms_organizations (last visited Feb. 2, 2015).

80. *The 2030 Challenge*, ARCHITECTURE2030, http://www.architecture2030.org/2030_challenge/the_2030_challenge (last visited Feb. 2, 2015).

81. *Id.*

82. *See, e.g.*, Steve Brown, *Developers Find Green Building is 'Good Business'*, DALLAS MORNING NEWS (Mar. 31, 2010, 12:51 PM), http://www.dallasnews.com/business/commercial-real-estate/20100331-
Developers-find-green-building-is-1188.ece.

83. Steve Zurier, *Home Buyers Willing to Pay for Energy Efficiency*, BUILDER ONLINE (Feb. 14, 2008), http://www.BuilderOnline.com/business/home-buyers-willing-to-pay-for-energy-efficiency.aspx (citing studies conducted by the National Home Builders Association finding that home buyers are willing to pay more up front for longer-term energy savings).

84. *Construction: NAICS 23*, BUREAU OF LAB. STATS., http://www.bls.gov/iag/tgs/iag23.htm (last updated Dec. 19, 2014).

and be an increasing source of skilled jobs.[85] Studies show that increasing the efficiency of electrical use leads to net increases in both employment and overall personal income.[86] At present, however, there are barriers to the realization of nation-wide energy-efficient building standards. State efforts to promote efficiency vary widely.[87] At the national level, mandates for an energy-efficient private building sector are restricted to the promotion (but not implementation) of progressive building energy codes.[88]

In promoting the efficiency measures of his Climate Action Plan, President Obama recognized that "upfront costs act as a barrier to more widespread investment."[89] To counteract this, the federal government has encouraged investment through low-rate loans and tax credits.[90] For example, the Energy Policy Act of 2005 authorized a tax credit of approximately $1.80 per square foot for commercial buildings that achieved energy use at fifty percent below the 2001 model building codes.[91] However, few buildings have taken advantage of tax incentives in the commercial sector.[92]

The fact that few commercial building owners have taken advantage of the tax incentives is due to a pervasive perception that existing incentives are insufficient to cover the up-front costs.[93] This may be due in part to *who* may receive these credits: the majority of available credits can only be claimed by building owners.[94] The only credit extended to tenants is a potential claim for a limited credit to change for changing to more efficient lighting, which can only do so much for overall energy efficiency.[95] The addition of long-term energy cost savings to credits and

85. Press Release, McGraw-Hill Constr., Construction Industry's Workforce Shortage Brings Concerns, but Green Jobs Bring Promise, According to New McGraw-Hill Constr. Report (May 17, 2012), *available at* http://construction.com/about-us/press/construction-industry-workforce-shortage-concerns-green-jobs-bring-promise.asp.

86. David Roland-Holst, Ctr. for Energy, Res., & Econ. Sustainability, Energy Efficiency, Innovation, and Job Creation in California 4–5 (2008); Howard Geller & Marshall Goldberg, Sw. Energy Efficiency Project, Energy Efficiency and Job Creation in Colorado 3 (2009).

87. *See infra* Part II.A.

88. *Building Energy Codes Program: Adoption Process*, U.S. Dep't of Energy, http://www.energycodes.gov/adoption/process (last updated Aug. 17, 2012).

89. President's Climate Action Plan, *supra* note 42, at 9.

90. *Id.*

91. *See* 26 U.S.C. § 179D (2005).

92. Martin Flusberg, *Senate Bill S. 3591—a.k.a. the Commercial Building Modernization Act*, Powerhouse Dynamics Blog (Feb. 20, 2013, 7:28 AM), http://blog.powerhousedynamics.com/senate-bill-s-3591-aka-the-commercial-building-modernization-act (citing the low per square foot deduction as a key reason for low enrollment in the Energy Efficient Buildings Tax Deduction).

93. *See* Patrick J. O'Connor, Jr. & Timothy R. Twomey, Drafting and Negotiating Construction and Design Contracts: Meeting the Challenges of Sustainable Development 2010, 581 Prac. L. Inst. 131, 136 (2010).

94. *See* I.R.S. Notice 2008-40, 2008-1 C.B. 725 (Apr. 7, 2008).

95. *See id.* at 727–28.

incentives might sufficiently make up for incentives that fail to cover up-front costs.

Owner-only incentives work well where the owner is also the tenant, and therefore, the user of the building, but there are many situations in which the owner does not pay the utility bills.[96] In a building where the utilities are paid by a lessor or where the building is designed and built by a developer with the intent to sell to an end user, there is no confluence between the up-front investment and the available deduction and the utility savings. As such, the incentive for investment in efficiency decreases dramatically.

There are good reasons to focus regulatory efforts on building efficiency. Efficient buildings offer a significant opportunity to cut GHG emissions in a manner that is cost efficient, saves consumers money, and benefits the overall economy. Energy efficiency draws wide support from voters, policymakers, and the industry. Moreover, it is possibly the only place where the majority of Americans have similar views on how to promote national security interests, save money, and protect the environment all at the same time.[97] Energy efficiency, building energy specifically, is the low-hanging fruit of energy policy. It makes sense to pluck it; the only real question is how.

II. Building Energy Codes: The Current Landscape and Possible Expansion

The most significant regulation of building energy use currently in place comes from state building energy codes.[98] This Part examines the current state of building energy codes in the United States. It describes the existing program, including how more progressive codes are written and adopted. It identifies details of current energy codes that are key to the goal of reducing GHG emissions as well as where the codes fail that purpose. It concludes with a consideration of how to alter the current system to improve upon its successes and mitigate its weaknesses.

A. The Building Energy Code You Know and Love

Building codes generally come into play in the design and construction phases of new buildings and major remodels. Building

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96. *See, e.g.*, Flusberg, *supra* note 92.

97. *See, e.g.*, Tolan, *supra* note 65, at 238–39; *Energy 2030 Goal*, Alliance to Save Energy, http://www.ase.org/policy/energy2030 (last visited Feb. 2, 2015); Roberta Combs, *For the Sake of America's Families, Pass the Energy Efficiency Bill*, Hill (Sept. 20, 2013, 7:00 PM), http://thehill.com/blogs/congress-blog/energy-a-environment/323521-for-the-sake-of-americas-families-pass-the-energy-efficiency-bill; Jeff St. John, *The Liberal-Conservative Non-Divide on Home Energy Efficiency?*, Greentech Media (June 20, 2013), http://www.greentechmedia.com/articles/read/the-liberal-conservative-non-divide-on-home-energy-efficiency.

98. *See Building Energy Codes Program: Adoption Process*, *supra* note 88.

energy codes touch on almost every aspect of building design, but most prominently the building's thermal envelope and insulation; water heating; electrical system; lighting; and heating, ventilation and air conditioning ("HVAC").[99] Traditional building energy codes—commonly referred to as the "prescriptive path"—provide a set of rules for each area which, combined, assure the designer and builder that the building is "up to code."[100]

A simple example of this prescriptive path would be a requirement that the building's thermal envelope[101] have a certain resistance to heat transfer from the exterior to the interior, or vice versa—that is, the insulation in the attic of a commercial building has a minimum R-value and the walls meet a separate (usually lower, since heat is primarily gained and lost through the roof) R-value.[102] Another example might be that a residential kitchen's lighting would provide a certain amount of light (measured in foot candles and calculated by the number and rating of light) per square foot, but not draw above a certain maximum wattage.[103]

Generally, a builder meets a prescriptive path by following code guidelines and tables to install fixtures and components approved by the state or municipality.[104] Compliance with these requirements is checked at both the planning and permitting stage and by building inspectors during construction.[105]

Deviations from the typical prescriptive path are possible via a second route to compliance known as the "Total UA Alternative."[106] With the Total UA Alternative path, a builder swaps out components, and supplies the plan-checker with U-values[107] for the alternatives, as well as calculations proving that the overall UA of the building envelope (the total thermal resistance of the entire building envelope) is at least equal to the prescriptive path.[108] Compliance with both the UA

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99. U.S. Dep't of Energy, Building Energy Codes Resource Guide: Commercial Buildings for Architects 15 (2011) [hereinafter U.S. Dep't of Energy, Commercial Buildings].

100. *Id.* at 28–29.

101. The thermal envelope is the continuous barrier that separates the interior conditioned space of a building from the exterior weather conditions. It consists of roof, walls, windows, doors, foundation, etc. Thermal resistance, the amount of time it takes for heat to move through something, is measured in R-value for materials (like insulation) and U-value for components (likes a window or a wall assembly).

102. *See, e.g.*, 24 Cal. Code Regs. tit. 24, § 110.8 (2014).

103. *Id.* at § 110.9.

104. Martin Holladay, *Are Energy Codes Working?*, GreenBuildingAdvisor.com (Feb. 4, 2011), http://www.greenbuildingadvisor.com/blogs/dept/musings/are-energy-codes-working.

105. *See, e.g.*, 24 Cal. Code Regs. tit. 24, § 140.6 (a)(1)(A), (a)(2)(C)(i) (2014).

106. Holladay, *supra* note 104.

107. *Id.*

108. *Id.*

alternative and the prescriptive path is verified by the plan-checker and building inspector on-site.[109]

More recently, building codes have adopted a third approach based on predictions of the actual building performance known as the simulated performance path, or performance path.[110] Under the performance path, permitting agencies grant permits based upon energy modeling calculations that project how a building will use energy over its life, using predictions of the load requirements and interaction of individual components.[111] There are a number of software platforms that can perform these calculations, which the architects, engineers, or third-party inspectors perform during the design and permitting process.[112] This path tends to be far more expensive than the prescriptive path and the Total UA Alternative path because of the increased design and engineering costs, but it allows for the greatest flexibility.

It would be prohibitively expensive for every locality to generate an individual building code from scratch. Instead, the basis for building codes in the United States (including building energy codes) are model codes written by nonprofit, nongovernmental code councils with the goal of determining minimum standards for buildings.[113] The membership of these councils encompasses a wide range of stakeholders and includes government energy, code enforcement, and fire officials, as well as representatives from the design, engineering, and building industries.[114] The model building energy code for residential buildings is the International Energy Conservation Code ("IECC"), written by the International Code Council ("ICC"); for commercial buildings, the model is the ASHRAE 90.1 standard.[115] Model building energy codes are updated every three years in a process that mirrors the promulgation of agency regulation.[116] Any interested party can propose changes to the code; notice is posted, including notice in the Federal Register; the proposal is taken through repeated periods of public comment and committee hearing; and finally, the governmental members of the code council vote on the proposed changes.[117] Though the promulgation process is much like that of regulation, the codes are models, in that they

109. *Id.*
110. *Id.*
111. *Id.*; U.S. DEP'T OF ENERGY, COMMERCIAL BUILDINGS, *supra* note 99, at 25.
112. Holladay, *supra* note 104.
113. INT'L CODE COUNCIL, ICC CODE DEVELOPMENT PROCESS 2 (2013), *available at* http://www.iccsafe.org/abouticc/documents/govtconsensusprocess.pdf.
114. *See* PETER S. BRITELL, GREEN BUILDINGS: LAW, CONTRACT AND REGULATION § 2.12 (2013).
115. *Id.* at 2–3; U.S. DEP'T OF ENERGY, BUILDING ENERGY CODES 101, *supra* note 62, at 5–7.
116. INT'L CODE COUNCIL, *supra* note 113, at 7.
117. *Id.* at 2–3; U.S. DEP'T OF ENERGY, BUILDING ENERGY CODES 101, *supra* note 62, at 7.

are meant to be mandatory only when they have been passed through the additional step of adoption by localities.[118]

While the federal government is involved in directing and planning model building energy codes, there is currently no national building energy code for the United States.[119] Instead, the federal government, through the Department of Energy, plays an advisory role in the creation of the model codes, but does not require local implementation.[120]

By statute, whenever a revision of one of the model building energy codes is made, the Secretary of Energy must publish a determination as to whether the new code represents an improvement in the energy efficiency for the relevant buildings.[121] If the Secretary determines that the revision improves energy efficiency, then each state is required to compare the updated code to their current energy code and make a determination as to whether their own code should be updated to either meet or exceed the new code standards.[122]

Beyond the Secretary's recommendation, though, whether a given state adopts the new, more efficient code is at the discretion of the state.[123] The Secretary is required to provide technical assistance to localities to aid in implementing the code, and she has the authority to release funding to incentivize state adoption, or even local adoption in non-adopting states, but the federal government cannot require states to enact stricter energy codes.[124] Indeed, any attempt to require more of the states would raise obvious federalism questions.

As a result, the implementation of building energy codes is inconsistent throughout the country. The Department of Energy has certified each revision of model building energy codes as more efficient than the last.[125] However, only eight states have adopted the most recent

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118. Int'l Code Council, *supra* note 113, at 2–3; U.S. Dep't of Energy, Building Energy Codes 101, *supra* note 62, at 7.

119. Int'l Code Council, *supra* note 113, at 2–3; U.S. Dep't of Energy, Building Energy Codes 101, *supra* note 62, at 7.

120. Int'l Code Council, *supra* note 113, at 2–3; U.S. Dep't of Energy, Building Energy Codes 101, *supra* note 62, at 7.

121. 42 U.S.C. § 6833(a)(5)(A), (b)(2)(A) (2014). The Secretary's actions and responsibilities regarding building energy code were granted under the authority of the Energy Conservation and Production Act, Pub. L. No. 94-385, 90 Stat. 1125 (1976) (codified as amended at 42 U.S.C. §§ 6801–6892 (2014)).

122. § 6833(a)(5)(B), (b)(2)(B).

123. *Statutory Requirements: State Building Energy Efficiency Codes,* U.S. Dep't of Energy, http://www.energycodes.gov/about/statutory-requirements (last updated May 21, 2013) [hereinafter *Statutory Requirements*].

124. § 6833(e); *see Statutory Requirements*, *supra* note 123.

125. *See, e.g.*, Mark Halverson et al., Pac. Nw. Nat'l Lab., ANSI/ASHRAE/IES Standard 90.1-2010 Final Determination Quantitative Analysis (2011) (finding 18.2 energy savings for standard 90.1-2010 over 90.1-2007); Mark Halverson et al., Pac. Nw. Nat'l Lab., ANSI/ASHRAE/IES Standard 90.1-2007 Final Determination Quantitative Analysis (2011) (finding 3.9 energy savings for standard 90.1-2007 over 90.1-2004).

2010 ASHRAE and 2012 IECC standards.[126] Thirty-two states have regulations that are equivalent to the previous ASHRAE 2007/IECC 2009 standards, but in ten states, building energy regulations are still less efficient than the standards promulgated by ASHRAE 2001 and IECC 2003.[127] Eight of those ten states have no building energy regulation at all.[128]

To illustrate the cost of states failing to adopt the model codes, the National Institute of Standards and Technology ("NIST") recently estimated that if states with no building energy code or a code adopted prior to 2007 updated their building code standards to at least ASHRAE 2007, it would reduce building energy use for new construction by close to 10 , which translates to an average of 12 energy cost savings and a 12.4 reduction in energy-related carbon emissions over the next ten years.[129] Nationwide compliance with the most up-to-date standards for new construction and remodels would reduce energy use over current energy codes by close to 18 , or an average of 20 energy cost savings and 22 reduction in emissions.[130] It comes as no surprise, then, that the states with the greatest potential for cost savings and emission reductions are the states that have no statewide building energy code, some states achieving cost and emissions savings greater than 30 .[131]

Given that the 22 emission reduction is based on compliance with model codes that are designed as a *minimum* standard, the missed opportunity of widespread updated building energy codes is almost galling.[132] There are also other, less obvious drawbacks to the current system of local building energy code adoption.

Even if individual states choose not to adopt energy codes, municipalities may still wish to do so, and indeed, can. The City of Tucson is an example of a local jurisdiction that adopted strict building energy codes within a state that has no adopted energy code at all.[133] Large cities may have the resources to effectively determine appropriate implementation of model codes, but smaller municipalities may lack the expertise necessary to adapt national models to local conditions.[134] As a result, there has been a rise in localities that have unsuccessfully adopted code measures based on LEED that were unsuitable for their

126. *Status of State Energy Code Adoption*, U.S. DEP'T OF ENERGY, http://www.energycodes.gov/status-state-energy-code-adoption (last updated July 17, 2014).

127. *Id.*

128. *Id.*

129. KNEIFEL, *supra* note 20, at 141.

130. *Id.*

131. *Id.* at 141–42.

132. *See* U.S. DEP'T OF ENERGY, COMMERCIAL BUILDINGS, *supra* note 99, at 3.

133. *Building Codes*, CITY OF TUCSON, http://cms3.tucsonaz.gov/pdsd/codes-ordinances/building-codes (last visited Feb. 2, 2015).

134. Michael Allen Wolf, *A Yellow Light for "Green Zoning": Some Words of Caution About Incorporating Green Building Standards into Local Land Use Law*, 43 URB. LAW. 949, 952, 964–66 (2011).

jurisdictions.[135] The LEED rating system has been criticized as inflexible, and since buildings must be designed in response to the specific environmental and climactic conditions in which they exist, this type of one-size-fits-all approach is often inappropriate.[136] Not only does the approach frequently fail to address the intended problem, but also it is often counterproductive for three reasons.

First, it needlessly burdens the local agencies that must administer a regulation in which they have no expertise.[137] The Department of Energy assists states and municipalities in implementing the model codes they have certified, but training local building inspectors to follow LEED protocols written by the USGBC have no similar source of funding. Second, building owners subject to the inappropriate regulation see increased costs without realizing the cost and/or benefits of energy savings.[138] There is already misconception and overestimation of the cost of green building and this type of anecdotal evidence only furthers that narrative.[139] To continue applying these codes without the expertise required to do it correctly similarly furthers this narrative and leads to a negative perception of energy-efficient building.

Third, and perhaps most importantly, the lack of a unified building energy code prevents the nation from being able to adequately predict and prepare for future energy needs. The Department of Energy is tasked with analyzing and predicting American energy use.[140] Through the Energy Information Administration, the Department issues an annual energy outlook that reports on electricity use by sector and source.[141] The Department bases its predictions for energy use on federal, state, and local laws and regulations, and the correlating supply and generational capacity of those jurisdictions.[142] However, regulatory uncertainty and unreliable compliance with voluntary programs make it difficult for agencies to accurately predict the nation's future energy needs.[143] Since the nation's power supply must be ready to accommodate maximum need, and plans for future generation are based on predicted

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135. *Id.*

136. Sarah Schindler, *Following Industry's LEED: Municipal Adoption of Private Green Building Standards*, 62 FLA. L. REV. 285, 322 (2010).

137. Wolf, *supra* note 134, at 965–66.

138. *Id.*

139. *See* Harvey Berman, *The Cost of Building Green—Perception v. Reality*, ANN ARBOR NEWS (Jul. 1, 2010, 5:55 AM), http://www.annarbor.com/business-review/the-cost-of-building-green---perception-vs-reality (citing studies by the USGBC).

140. Department of Energy Organization Act, Pub. L. No. 95-91, 91 Stat. 565 (1977) (codified at 42 U.S.C. § 7152 (2014)).

141. *See* U.S. ENERGY INFO. ADMIN., ANNUAL ENERGY OUTLOOK 2013 WITH PROJECTIONS TO 2040, at 61–67, 71–74 (2013) [hereinafter ANNUAL ENERGY OUTLOOK 2013].

142. *Id.*

143. *Id.*

future use, it is inevitable that uncertainty about future use will lead to a precautionary overestimation of the need for generation. There is a strong likelihood that such overestimation could consequently lead to the increased permitting of expanded or new power plants, perhaps to the point of excess energy production for a given region.

The majority of the United States still relies on coal-fueled power.[144] While new coal plants are unlikely, increasing capacity at existing plants is feasible.[145] Furthermore, the predominant predicted source for the future generation of electricity is natural gas.[146] Natural gas may have lower carbon content than coal, but it still has a carbon impact, both in mining and burning.[147] Regardless of the source, the lowest emitting power plant is the one that is not built. Similar to "right-sizing" in buildings, the accurate prediction of, and preparation for future energy needs is crucial to curbing emissions from electricity generation.

As the most prominent regulation of building energy, building codes increase overall building energy efficiency. Problems remain, however, as the lack of uniform laws leaves missed opportunities for the reduction of emissions and creates instability in predictions of the nation's overall energy picture, which necessarily leads to increased overall carbon emissions.

B. Building Energy Code: Potential for Future Expansion

The NIST study cited in Subpart II.A shows a clear correlation between the implementation of building energy codes and efficiency gains in building stock.[148] Those efficiency gains come with a consequent lowered demand on the power grid and reduced emissions.[149] The same study, however, shows uneven implementation of codes and consequent missed opportunities for emission reductions.[150] Energy productivity

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144. *See Electricity Explained: Electricity in the United States*, U.S. Energy Info. Admin., http://www.eia.gov/energyexplained/index.cfm?page=electricity_in_the_united_states (last updated Aug. 12, 2014); *Energy in Brief: What is the Role of Coal in the United States?*, *supra* note 13.

145. Annual Energy Outlook 2013, *supra* note 141, at 71.

146. *Id.*

147. Indeed,

> [t]he average emissions rates in the United States from natural gas-fired generation are: 1135 lbs/MWh of carbon dioxide, 0.1 lbs/MWh of sulfur dioxide, and 1.7 lbs/MWh of nitrogen oxides. Compared to the average air emissions from coal-fired generation, natural gas produces half as much carbon dioxide, less than a third as much nitrogen oxides, and one percent as much sulfur oxides at the power plant. In addition, the process of extraction, treatment, and transport of the natural gas to the power plant generates additional emissions.

Natural Gas: Electricity from Natural Gas, U.S. Envtl. Prot. Agency, http://www.epa.gov/cleanenergy/energy-and-you/affect/natural-gas.html (last updated Sept. 25, 2013).

148. *See supra* Part II.A.

149. *See supra* Part II.A.

150. *See supra* Part II.A.

advocates suggest that a more stringent, broadly accepted energy code could significantly contribute to doubling the nation's energy productivity and reducing the nation's overall GHG emissions by one third.[151] But the question of how to increase building efficiency in regions that do not adopt energy codes remains. While the United States has left building energy regulation to local governments, other countries have chosen a national building energy code. International implementation of building energy codes may be instructive, but if broader acceptance is the goal, the mixed results are not particularly encouraging.

In 2002, the European Union passed Directive 2002/91, Energy Performance of Buildings Directive ("EPBD"), which required all member states to enhance their building energy regulations and introduce energy-use certification programs that tracked actual energy use by buildings.[152] The 2002 EPBD met with sufficient success to be supplanted in 2010 with a more rigorous Directive that required new energy calculation methodologies and stricter performance requirements.[153] The EPBD also mandated that all member states begin to move their regulation toward "nearly zero-energy buildings."[154] All European Member States were required to accept the building EPBD, but political acceptance has not necessarily translated into successful implementation.[155] Some member states have reported progress, but a lack of quality information from others suggests uneven success.[156] The Concerted Action ("CA") task group that helps Member States implement EPBD recently found that regulations have been introduced in all member states, but that citizens remain ignorant of the regulations and do not comply because of a lack of enforcement.[157] The CA also suggested that problems with the quality of enforcement in some regions could compromise the overall market credibility of energy regulations.[158]

Australia has had a similar, progressive national building energy code written into the Building Code of Australia since 2006.[159] However, a key difference between the Australian and U.S. models for building

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151. Rhodium Group, American Energy Productivity: The Economic, Environmental and Security Benefits of Unlocking Energy Efficiency 15 (2013), http://rhg.com/wp-content/uploads/2013/02/RHG_AmericanEnergyProductivity_ExecutiveSummary.pdf.

152. Directive 2002/91, of the European Parliament and of the Council of 16 December 2002 on the Energy Performance of Buildings, 2002 O.J. (L 1) 65–71.

153. Directive 2010/31, of the European Parliament and of the Council of 19 May 2010 on the Energy Performance of Buildings (recast), 2010 O.J. (L 153) 13–35.

154. *Id.* at 15.

155. *See* Concerted Action, Implementing the Energy Performance of Buildings Directive (EPBD) 57 (2013).

156. *Id.* at 57–58.

157. *Id.*

158. *Id.*

159. *Energy Efficiency: NCC Energy Efficiency Provisions*, Austl. Bldg. Codes Bd., http://www.abcb.gov.au/en/work-program/energy-efficiency.aspx (last updated Nov. 27, 2014).

energy code is the method of adoption. The U.S. model, as previously discussed, is a model code that is approved by the federal government and dispersed for adoption by states and/or cities.[160] By contrast, the Australian building energy code is a regulation written and updated in coordination with the National Strategy on Energy Efficiency, a product of the Council of Australian Governments ("COAG").[161] The United States does not have an equivalent inter-jurisdictional organization capable of leading such an effort, let alone coming to a unified agreement. It is of note that the recent ouster of the Australian Labor government has been attributed, in part, to that government's climate change policies.[162] The new Conservative Government, upon assuming power, immediately announced a plan to replace mandated efficiency programs with a voluntary program of grants and subsidies.[163] As a result, the fate of Australian building energy codes is uncertain.

Canada is the nation most similar to the United States in terms of climatic and demographic conditions. Canada also has similarly centralized model construction codes that take effect only through implementation by individual provinces.[164] While the Canadian codes are prepared in partnership with provincial and territorial governments,[165] Canada has had even less inspiring results than the United States in terms of the adoption rate of the model energy codes. The most recent edition of the Canadian code, National Energy Code for Buildings ("NECB") 2011, has been adopted in only four of the thirteen provinces and territories.[166]

In the United States, there has been one major effort to federalize and unify the building energy code. The wide-reaching American Clean Energy and Security Act of 2009 ("ACES"), which passed in the House of Representatives but died in the Senate before the 2010 election,[167] included provisions that would have required the Department of Energy

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160. *See supra* Part II.A.

161. COAG is an intergovernmental agency that includes both national and territorial governments and promotes policy reforms of national significance that require the coordinated actions of all Australian governments. *About COAG*, COUNCIL OF AUSTL. GOV'TS http://www.coag.gov.au/about_coag# (last visited Feb. 2, 2015).

162. *See* John McTernan, *Five Things the Australian Labor Party Needs to Do Now*, GUARDIAN (Sept. 9, 2013, 7:19 PM), http://www.theguardian.com/commentisfree/2013/sep/10/australia-labor-party.

163. Rob Wile, *Australia's New Prime Minister Wants to Immediately Dismantle His Country's Fight Against Climate Change*, BUS. INSIDER (Sept. 7, 2013, 10:01 AM), http://www.businessinsider.com/tony-abbott-climate-change-policy-2013-9.

164. BIN SHUI & MEREDYDD EVANS, PAC. NW. NAT'L LAB., COUNTRY REPORT ON BUILDING ENERGY CODES IN CANADA 3 (2009).

165. *Id.*

166. *Model Code Adoption Across Canada*, NAT'L RES. COUNCIL CAN., http://www.nrc-cnrc.gc.ca/eng/solutions/advisory/codes_centre/code_adoption.html (last updated Oct. 9, 2014).

167. American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. (2009).

to adopt a national building energy code.[168] The bill noted the ASHRAE and IECC model baselines and directed the Secretary to establish a code that would establish efficiency standards at the maximum level that was technically feasible and cost justified.[169] The bill required that states either adopt an energy code at an equivalent or more efficient standard than the national code, or simply adopt the national code.[170] Additional language in the bill would have required the Secretary to consider ways in which the new national energy code could achieve the goal of zero-net energy commercial buildings.[171]

Of course, ACES famously failed to become law.[172] What this failure means for the establishment of a national building energy code is unclear. The building energy language of ACES was a small part of a broad and comprehensive energy bill that also included a contentious carbon cap and trade program.[173] Without a record of separate consideration of building energy regulation, it is hard to draw any conclusions from either its passage by the House, or the bill's overall failure.

In general, energy efficiency does draw bipartisan support in Congress.[174] Congress has further expressed willingness for the federal government to take an *advisory* stake in the regulation of building energy.[175] However, Congress has also indicated a clear preference for building energy to be regulated at the state level.[176] With congressional intent clear, any agency action to promulgate mandatory national standards would be unlikely to survive judicial review.[177] Furthermore, if Congress *did* consider a change of direction and direct the Department of Energy to promulgate a national energy code, it would also have to fund or implement that code pursuant to the anti-commandeering doctrine.[178] If the states resisted implementing the new code themselves, the Department of Energy would be faced with the unenviable task of

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168. *Id.* § 201.

169. *Id.*

170. *Id.*

171. *Id.*

172. Carl Hulse & David M. Herszenhorn, *Democrats Call Off Climate Bill Effort*, N.Y. TIMES, July 23, 2010, at A15.

173. *See generally* H.R. 2454.

174. *See, e.g.*, Nick Juliano, *Shaheen, Portman Mulling New Bill with Sweeteners to Attract GOP Votes*, E&E PUBLISHING, LLC (Oct. 28, 2013), http://www.eenews.net/stories/1059989472.

175. *See* 42 U.S.C. § 6833(a)(5)(A), (b)(2)(A) (2014).

176. "*State and local building codes* or similar controls can provide an existing means by which to assure, in coordination with other building requirements and *with a minimum of Federal interference in State and local transactions*, that newly constructed buildings contain adequate energy conservation features." *Id.* § 6831(a)(4) (emphasis added).

177. *See* STEVEN ALAN CHILDRESS & MARTHA S. DAVIS, 3 FEDERAL STANDARDS OF REVIEW § 17.02 (4th ed. 2013).

178. *See* Printz v. United States, 521 U.S. 898, 935 (1997) (holding that Congress cannot commandeer state officers to administer or enforce a federal regulatory program).

running operations in noncompliant states and adopting the role of the permitting and inspecting agency for every new building and remodel in that state.

Without the resources of the local municipalities who currently handle the permitting and inspection role, a national energy code is practically infeasible. Further, Congress would consider the decision to increase federal presence in a political environment where state resistance to the expansion of federal government programs has increased dramatically.[179] Given the recent resistance to increased federal involvement in areas traditionally reserved to the states, it is difficult to imagine Congress seriously considering a federal mandate.

Even if it were realistic to consider a mandatory national program, federal implementation could also lead to counterproductive hostility to building energy regulation, of particular concern where regulation addressing climate change is concerned.[180] Energy codes require the willing participation of stakeholders, as compliance can be easily avoided.[181] Builders, the primary affected party here, have mixed feelings about permitting, inspections, and regulatory involvement in their projects.[182] In a region where there is currently no permit system for construction, a national code would force builders to deal with a federal agency in order to complete their projects. In states with building codes, but no energy codes, builders would be forced to get permits and inspections from both the local authority *and* the Department of Energy. It is easy to imagine the pushback from builders who would not want to deal with additional regulatory responsibilities.

While mandatory building codes adopted at the federal level look unlikely, advocacy efforts at the state level could bring about broader adoption of updated energy codes. As discussed, energy efficiency generally enjoys widespread popularity.[183] Advocacy for building energy codes, however, has been met with resistance. SEEAction, a state- and local-led effort working in tandem with the Department of Energy, has

179. *See, e.g.*, Bruce Alpert, *GOP Governors Refusing to Implement 'Obamacare' Making Things Difficult, President Says*, TIMES PICAYUNE (Apr. 30, 2013, 6:42 PM), http://www.nola.com/politics/index.ssf/2013/04/gop_governors_refusing_to_impl.html.

180. *See, e.g.*, Adam Sparks, *Who Shut Off the Lights? Bring Back the Incandescent Lightbulb*, BREITBART (Feb. 8, 2011), http://www.breitbart.com/Big-Government/2011/02/08/Who-Shut-Off-the-Lights--Bring-Back-the-Incandescent-Lightbulb.

181. *See* Carl Seville, *Energy Code Enforcement is a Mixed Bag*, GREENBUILDINGADVISOR.COM (Nov. 29, 2011), www.greenbuildingadvisor.com/blogs/dept/green-building-curmudgeon/energy-code-enforcement-mixed-bag; SEEACTION, BUILDING ENERGY CODES WORKING GROUP BLUEPRINT 18 (July 15, 2011), *available at* https://www4.eere.energy.gov/seeaction/system/files/documents/buildingcodes_blueprint.pdf.

182. *See, e.g.*, Tim Carter, *Building Inspectors*, ASK THE BUILDER, http://www.askthebuilder.com/building-inspector (last visited Feb. 2, 2015).

183. *See supra* Part 1.

identified the main topics that need to be addressed to appeal to both private and public stakeholders.[184]

Resistance comes primarily from the building industry, based on a fear of increased up-front costs that eat into their bottom line.[185] However, industry support is possible and turns primarily on the information issue. The most significant factor to overcome is the misperception of cost. The general public widely and largely overestimates the cost of efficient buildings.[186] Builders and developers who are inexperienced with green building share this overestimation equally. The majority of participants in a 2009 study of building professionals estimated a ten to twenty-five percent cost premium for green building, when the premium in fact was as low as one to two percent.[187] The best way to overcome this information gap is with education and sharing the experience of builders in areas that have adopted efficient energy codes.

In some adopting states, an educated building community has shown a motivation to engage with building energy regulation, provided that they are given a voice in the promulgation of regulations. For example, in California, the state's CALGreen standards received wide support from the building industry after the state invited industry participation into the adoption process.[188] The results also reflect the building industry's increasing recognition that their customer base *wants* an efficient product, and that delivery of such buildings can be profitable.[189]

State and local governments also face information issues, as well as concerns about cost.[190] Like builders, policymakers are presented with contradictory information about the cost of efficient building regulation, and they must base their decisions upon the information at their disposal.[191] Again, like builders, the best way to meet cost concerns is with hard information about actual costs and benefits from states in which codes have been adopted. From a macroeconomic perspective, savings in energy costs balance the increased cost of building stock,[192]

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184. *See generally* SEEAction, *supra* note 181.

185. *Id.*

186. Berman, *supra* note 139.

187. *Id.*

188. Rich Binsacca, *California Builders Work Together to Create More Stringent Green Building Codes*, Builder (Nov. 10, 2008), http://www.builderonline.com/green-building/left-coast-formula.aspx ("Perhaps the most note-worthy aspect of California's new mandatory green building codes is the complete support it received from the state's Building Industry Association (CBIA).").

189. *See* U.S. Dep't of Energy, Energy Efficiency Trends in Residential and Commercial Buildings 12 (2008).

190. SEEAction, *supra* note 181, at 18.

191. *Id.*

192. *Step 1: Understand the Benefits of Code Adoption*, U.S. Dep't of Energy, http://www.energycodes.gov/resource-center/ACE/adoption/step1 (last updated Jan. 31, 2013).

and efficiency codes have been cited as a net gain to local economies in terms of both jobs and the value of housing stock.[193]

Local government concerns to be mitigated include costs for the training for and administration of new building energy codes.[194] These costs encompass the development and adaptation of codes to local conditions, as well as training required for planning departments and building inspectors to carry out the actual implementation of the new regulations.[195] These concerns cannot be discounted, particularly in regions that face pressure to cut back on government spending. However, federal funding is available to aid states and municipalities with implementation.[196] Such funding, combined with the promise of benefit to local economies and constituent advocacy, may be sufficient to offset some concerns about administrative costs. Furthermore, as utility providers face increasing pressure to reduce emissions and meet increasing demands,[197] they have increased their financial support of efficiency programs for their service regions.[198] The potential of building energy regulation is not lost on electricity providers, and there is an increasing recognition in that industry about the role they can play in providing education, advocacy, and training opportunities for private markets and local governments.[199] Utilities providers have been instrumental in passing some of the most stringent state energy codes in the country, including codes in California, Massachusetts, and Minnesota.[200]

While there are clear benefits to a national energy code in terms of emissions reduction and predictability, there is no clear path to universal adoption. A national building energy code is unrealistic in the United States, and while codes themselves have benefits, the costs of implementation make it unclear that a national code is a worthwhile objective. Building codes are the current paradigm for building energy regulation and are effective, but expansion of this program at a national

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193. *Id.*

194. SEEACTION, *supra* note 181, at 18.

195. *Id.*

196. *See* 42 U.S.C. § 6833(e) (2014); *see Statutory Requirements*, *supra* note 123.

197. *See* INST. FOR ELECTRIC EFFICIENCY, INTEGRATING CODES AND STANDARDS INTO ELECTRIC UTILITY ENERGY EFFICIENCY PORTFOLIOS 1 (2011).

198. *See id.* at 5–13 (citing credits towards national and state regulatory goals as reasons for utility investment and advocacy in energy efficiency programs including building energy codes). While reducing demand for their product may seem counterintuitive, many states have decoupled the traditional profit model of utilities from the amount of power they produce and replaced it with a model based on access to service. For a full discussion of decoupling, see REGULATORY ASSISTANCE PROJECT, REVENUE REGULATION AND DECOUPLING: A GUIDE TO THEORY AND APPLICATION (2011). For a current list of states that have full or partial decoupling as part of utility regulation, see *DECOUPLING POLICIES*, CTR. FOR CLIMATE AND ENERGY SOLUTIONS, http://www.c2es.org/us-states-regions/policy-maps/decoupling (last visited Feb. 2, 2015).

199. INST. FOR ELECTRIC EFFICIENCY, *supra* note 197, at 3.

200. *Id.* at 7–10.

level is unlikely and would face many difficulties. However, advocating adoption at the state level is a realistic means of expanding the current scheme of regulation on a national scale, particularly when stakeholders have a say in the process, which may be effective in increasing compliance as well.

III. Energy Disclosure Requirements: A New Path

Building energy measurement and mandatory disclosure requirements are a relatively new arrival to the regulatory landscape.[201] While this means there is little data available on their efficacy, there is a logical argument that they form a valuable complement to building energy codes and could be implemented even in jurisdictions that have resisted adopting prescriptive regulations.

A. The Problem with Energy Codes

While building energy codes will likely continue to be the most common, and probably the most effective, means of regulating building energy, they are an incomplete solution. All codes are based on a predictive measure of building energy use. Prescriptive codes use assumptions of how the building will function as a whole, based on known ratings of the assembled parts.[202] Similarly, Total UA Alternative and performance modeling paths use calculations and computer modeling done prior to building construction.[203] These codes apply at the construction and major remodels of a building, but no building energy codes regulate *actual usage* of building energy during the life of the building. There is ample evidence, as discussed, that updated efficiency codes reduce overall building energy usage.[204] However, there is less evidence about the effect that efficiency codes have on *individual* buildings.

Logically, one would assume that if overall building energy use decreases when energy codes are applied to buildings, then individual buildings are using less energy. Yet, there is evidence that suggests that while overall usage decreases, a surprisingly high percentage of buildings designed according to stringent efficiency standards draw far more than their predicted power usage. A recent study of the energy use of buildings built to LEED standards found that, on average, the LEED buildings used twenty to forty percent less energy per square foot than

201. *See, e.g.*, Energy Independence and Security Act of 2007, Pub. L. No. 110-140, § 432, 121 Stat. 1492; Assemb. B. 1103, 2007–08 Leg., Reg. Sess. (Cal. 2007); S.B. 5854, 2009–10 Leg., Reg. Sess. (Wash. 2009).

202. *See supra* Part II.A.

203. *See supra* Part II.A.

204. *See supra* Part II.A.

their conventional counterparts.[205] However, when the same study looked at the energy use of the *individual* buildings in the study, it found that nearly a third of those buildings were actually using more than their conventional counterparts.[206]

If the measure of success is overall building energy use in a region, then it is not clear that such evidence matters. It makes little difference if one building fails to reduce usage if the building next to it reduces at twice the target rate: overall reduction meets the goal. However, an important factor in the success of efficiency standards is the reduction in costs paid by the user.[207] This factor is particularly significant in buildings, where offsetting the increased up-front cost of efficiency plays a vital part in the overall acceptance of such regulations. Overall energy costs may be reduced in a community, but this will mean little to a building owner who paid increased up-front costs and did not see a correlating decrease in her energy bill. The reasons for the disparate impact of regulation on individual buildings are not clear. Some analysts have suggested multiple explanations: occupancy hours may vary from design expectations, experimental technologies may not have performed as predicted, plug loads may have differed from those used in modeling, or, perhaps, buildings were not commissioned properly.[208] This situation highlights two concerns: (1) the importance of the general acceptance of building energy regulation and (2) the overall fairness of building energy regulation. Through building energy codes, building owners are asked to shoulder a cost for the reduction of energy use and GHG emissions. Regulations should be written in a way that provides the broadest possible compensation to those making the investment.

When prescriptive methods—as opposed to calculation-based methods—are included in effectiveness considerations, further possibilities open to matters as simple as siting differences. A prescriptive code might balance a greater percentage of windows for natural lighting, despite the loss of thermal efficiency. An affected building sited on a flat open space would gain full advantage of the natural light, with a consequent drop in lighting energy use. An identical building sited on the north-facing slope of a hill would gain limited natural lighting, but still lose significant thermal efficiency to those same windows. Similarly, a code that called for on-site solar power generation through a certain megawatt photovoltaic system[209] would have less of an

205. Guy R. Newsham et al., *Do LEED-Certified Buildings Save Energy? Yes, But . . .*, 41 ENERGY & BLDGS. 897, 904 (2009).

206. *Id.*

207. *See supra* Part II.

208. Newsham et al., *supra* note 205, at 903. Building commissioning is the process by which a building is passed from design and construction to operation.

209. To the best of the author's knowledge, no code *requiring* photovoltaic exists anywhere.

effect on a building that was shaded for part of the afternoon. In each of these situations, one building's energy efficiency is clearly benefiting from the code, while the other is not. However, both buildings would be required to plan and pay for systems that might not be effective for their particular microenvironment.

Furthermore, pre-operation codes are designed to be enforced preoccupation. As such, they are only as effective as the parties who enforce the codes and construct the buildings. These parties' incentives may or may not be aligned with following the codes to the letter, undercutting the effectiveness of the code.[210] These issues essentially point to the major shortcoming of regulation through a building energy code: while the code's overall effectiveness in reducing energy use and emissions is undeniable, its effectiveness on a building-to-building basis is mixed.

Consumers show a marked preference for efficient buildings, but consumer reliance on pre-operation code compliance is not necessarily justified. A consumer who is not intimately involved in the myriad hidden details behind creating an energy efficient building has no real way of knowing whether the up-front premium of efficiency is worth the individual investment in this particular building.

B. Energy Use Disclosure Requirements May Be a Solution

The concept behind energy use disclosure requirements is as simple as it sounds: a duty imposed on building owners to monitor and disclose the *actual* energy use of their building.[211] Use is measured and reported in megawatt hours, Btu, or simply in dollars and cents.[212] Energy disclosure requirements are currently in effect in California and Washington, as well as nine U.S. municipalities.[213]

In practice, disclosure laws generally fall into one of two categories. The first category, known as "benchmarking," is a general periodic audit

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210. Code enforcement on a building-to-building basis is the responsibility of individual building inspectors. One inspector might be responsible for inspecting every aspect of a building (structural, electrical, plumbing, energy) in a finite amount of time, and the attention paid to energy may be rigorous or loose, depending on individual attitudes about the relative importance of each aspect of the code. Builders may have similarly mixed and individual attitudes towards adherence to energy code. While statistical evidence is not readily available, anecdotal evidence suggests that there are as many shades of code compliance as there are builders and developers. The author spent thirteen years working in both commercial and residential construction in California, and cannot count the number of code-compliant energy-efficient lighting systems he witnessed being ripped out for noncompliant alternatives on the day following a building inspection.

211. *See, e.g.*, Assemb. B. 531, 2009–10 Leg., Reg. Sess. (Cal. 2009).

212. *Id.*

213. *Jurisdictions*, BUILDINGRATING.ORG, http://www.buildingrating.org/content/us-policy-briefs (last visited Feb. 2, 2015).

and disclosure requirement registered with a public, online database.[214] The second category is a similar requirement imposed on building owners at selective times: point of sale, lease, or mortgage.[215] Of the two categories, the more common regulation is benchmarking to a central government-run database.[216]

New York City's 2009 benchmarking law, Local Law 84, is emblematic of a general public disclosure requirement. Under Local Law 84, any owner of a commercial or multiunit residential building larger than 50,000 square feet is obligated to track and annually report that building's use of electricity, gas, fuel oil, steam, and water on a website database run by the New York Department of Finance.[217] The law's coverage includes approximately half of the total square footage in Manhattan.[218] Building owners are directed to use Energy Star software developed by the EPA and encouraged to directly upload their energy bills onto the city's website.[219] The publicly available benchmarking data includes each building's multiyear energy use information, as well as an Energy Star rating for each building, annual energy costs, and a rating number on a 1 to 100 scale similar to the home appliance ratings familiar to consumers.[220]

Selective disclosure laws, like California's A.B. 1103, are both more and less inclusive. A.B. 1103 applies only to nonresidential commercial buildings.[221] At implementation this year, only buildings larger than 50,000 square feet were covered by the law, but it is slated to gradually expand coverage to all commercial buildings greater than 5,000 square feet.[222] A.B. 1103 directs energy utilities to input use data for commercial buildings into the EPA's Energy Star system in a confidential manner; the building owner only discloses the information to the relevant parties at the point of sale, lease of the entire building, or mortgage.[223]

Some jurisdictions hybridize the two models. For example, the City of Austin has adopted an extremely progressive benchmarking ordinance, which includes residential properties, such as single-family

214. *See, e.g.*, 2009 N.Y.C. Local Law Nos. 84–85, 87, N.Y.C. Admin. Code §§ 28-309, 1001, 308 (2009).

215. *See, e.g.*, Assemb. B. 1103, 2007–08 Leg., Reg. Sess. (Cal. 2007).

216. *Id.*

217. 2009 N.Y.C. Local Law No. 84, N.Y.C. Admin. Code § 28-309 (2009).

218. *New York City: New York City's Local Law 84*, BUILDINGRATING.ORG, http://www.buildingrating.org/
jurisdiction/New 20York 20City (last visited Feb. 2, 2015).

219. *Id.*

220. *Id.*

221. California Energy Commission Regulations: Nonresidential Building Energy Use Disclosure Program, CAL. CODE REGS. tit. 20, §§ 1680–85 (2013).

222. *Id.*

223. Assemb. B. 531, 2009–10 Leg., Reg. Sess. (Cal. 2009).

homes, but only for selective disclosure.[224] Owners of commercial buildings greater than 10,000 square feet are subject to general disclosures, and multiunit residential owners must provide that information to prospective purchasers, and current and prospective lessors.[225] The ordinance further provides that buildings registering 150 percent of the average energy use for that type of building must perform an energy audit and implement energy improvements lowering their usage by twenty percent within 18 months.[226]

These disclosure requirements address issues that are problematic with building energy codes. They provide users and purchasers, as well as operators and municipalities, with real information about the energy use of buildings.[227] This kind of information is critical in identifying best practices for designing and building energy efficient buildings. Disclosure laws also further efficiency by providing a means to access market rewards for efficiency investment, by providing cost data for informed comparisons. An owner with access to such data can better attract tenants and justify above-market leases if she can show that the lessor's energy costs will be fifty percent below a competitor, thereby offsetting the cost of raised rents. Similarly, a seller has a powerful marketing tool in low operation costs and might justify a higher asking price by demonstrating that the less expensive building across the street will cost the occupant more in cost of purchase plus cost of operations.

While energy codes create a floor for efficiency, disclosure of energy costs opens the ceiling for building owners. It encourages builders to invest in efficiency to the greatest extent the market can bear, and to innovate to find cheaper ways to make more money. Further, transparent disclosure would create a system by which the most financially efficient means to cut energy use would be apparent, providing builders of future projects with a better means of estimating energy uses of projects while still in the planning stage.

Whether mandatory disclosure requirements are effective in meeting their purpose is still an open question, however. As stated, energy disclosure laws are a recent innovation in the American system: California's A.B. 1103 was the first statewide initiative to pass, in 2007, but implementation for most buildings was pushed back to January 2014.[228] Washington's S.B. 5854 is in force,[229] as are a number of

224. Austin, Tex., Code ch. 6–7, arts. I–VI (2011).
225. *Id.*
226. *Id.*
227. Michael Bobker, Friends of Benchmarking 10 (2012), *available at* http://sallan.org/pdf-docs/FOB_year1whitepaper_082712.pdf.
228. Cal. Code Regs. tit. 20, § 1682(2013).
229. Wash. Rev. Code § 19.27A.170 (2014).

municipal ordinances,[230] but the data pool is limited and no study has confirmed initial results.

There are inferences to be drawn from the E.U. and Australian markets. In Europe, energy certification and disclosure have been part of the Energy Performance of Buildings Directive since 2002.[231] Additionally, Australia has had a national energy disclosure requirement for commercial buildings since 2010.[232] A 2012 study of commercial leasing in the Netherlands after EPBD revealed a clear preference among lessors for buildings that met the energy certification requirements. The study found that buildings with an efficiency certification consistently rented for 6.5 more than equivalent nonrated buildings.[233] These results are consistent with studies of the Australian market, which shows a 12 market premium for Green Star rated buildings, providing owners with an encouraging 4 return on investment.[234]

Studies of American real estate markets have found both value and rental premiums for buildings that have voluntary Energy Star efficiency labeling (16 above market), as well as per se value in quantifiable and reported energy cost savings (a 1 increase in building value for each 10 decrease in energy consumption).[235] Industry studies also reveal that in addition to rental premiums, Energy Star buildings enjoy lower vacancy rates, even in constricted economies.[236] Recent studies conducted by the National Association of Home Builders showed an equally strong demand for efficiency rating in the residential market.[237] Ninety-one percent of homebuyers listed a whole home Energy Star rating as either desirable (63) or *essential* (28) in considering a new home purchase, and purchasers were willing to pay a premium for efficiency.[238]

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230. *See, e.g.*, AUSTIN, TEX., CODE ch. 6-7, arts. I-VI (2011); 2009 N.Y.C. Local Law Nos. 84-85, 87, N.Y.C. Admin. Code §§ 28-309, 1001, 308 (2009).

231. Directive 2002/91, of the European Parliament and of the Council of 16 December 2002 on the Energy Performance of Buildings, 2002 O.J. (L 1) 65–71, art. 16.

232. *See generally Building Energy Efficiency Disclosure Act 2010* (Cth) (Austl.).

233. NILS KOK & MAARTEN JENNEN, THE IMPACT OF ENERGY LABELS AND ACCESSIBILITY ON OFFICE RENTS, ENERGY POLICY 8 (2012).

234. INST. FOR BUILDING EFFICIENCY, ASSESSING THE VALUE OF GREEN BUILDINGS 5–6 (2012), *available at* http://www.institutebe.com/InstituteBE/media/Library/Resources/Green 20Buildings/Green-Building-Valuation-Fact-Sheet.pdf.

235. Piet Eichholtz et al., *Doing Well by Doing Good? Green Office Buildings*, 100 AM. ECON. REV. 2494, 2510 (2010).

236. Roger Showley, *'Green' Buildings Outperform in Vacancy, Rental Rates*, U-T SAN DIEGO (Sept. 5, 2012, 6:00 AM), http://www.utsandiego.com/news/2012/Sep/05/green-buildings-outperform-vacancy-rental-rates (reporting on studies by the U.S. GBC and CBRE).

237. Rose Quint, *What Home Buyers Really Want*, NAT'L ASS'N OF HOME BUYERS (May 1, 2013), http://www.nahb.org/generic.aspx?sectionID=734&genericContentID=206669&channelID=311; Zurier, *supra* note 83.

238. Quint, *supra* note 237.

These studies demonstrate a clear market preference for efficiency-labeled buildings in the United States. This preference suggests that American energy disclosure requirements will result in efficiency premiums for building owners similar to those enjoyed in the European Union and Australia. However, for a reporting system to be effective, the public must believe that the reporting system is accurate. One of the essential flaws in current disclosure requirements is that these statutes, by and large, have no serious enforcement mechanism.

General disclosure laws are enforced with civil penalties. Violations of New York City's Local Law 84, for example, are classified as civil violations, similar to those for building codes, and are punishable by fine of up to $2,000 per year.[239] When this fine is considered in light of the average commercial rent in New York, which is between $30 and $60 per square foot,[240] it is easy to understand why owners of an inefficient building would not be incentivized to disclose their information. The incentive to falsify disclosures is equally high if there is a premium to be gained through efficiency. A New York City building owner could cover a $2,000 annual penalty by renting out a small closet.

By contrast, selective disclosure laws—California's A.B. 1103 and Washington's S.B. 5854—have no enforcement provisions, but actually raise a more interesting enforcement possibility. While the purpose of general disclosure laws is somewhat amorphous—disclosure to potential tenants, municipal data collection, and owners' own use are all possible purposes—the purpose of selective disclosure laws can be more clearly inferred from the timing and recipients of the disclosures. Disclosure is required at the sale, lease, and mortgage of the building.[241] These laws are designed to provide tenants, purchasers, and lenders with information on which to base financial decisions.

This purpose raises the inference that violation of disclosure statutes, that is, falsifying energy use records to appear more efficient, could be grounds for a private right of action for fraud or negligent misrepresentation of a material fact.[242] The reliant party would have a common law claim enforceable by either rescission of the contract or damages, that is, the cost of bringing the building to the represented state.[243] Similarly, a complete failure to provide energy use data would be

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239. N.Y.C. COMM'R OF BLDGS., NOTICE OF ADOPTION OF RULES 14–15 (Mar. 30, 2011), *available at* http://www.nyc.gov/html/planyc2030/downloads/pdf/040111_final_benchmarking_rule.pdf.

240. BOBKER, *supra* note 227, at 11.

241. *See, e.g.*, Assemb. B. 531, § 1, 2009–10 Leg., Reg. Sess. (Cal. 2009).

242. *See* BRUCE SIMON ET AL., 1 PRACTICE GUIDE: CALIFORNIA UNFAIR COMPETITION AND BUSINESS TORTS § 4.06 (2014).

243. *Id.*

based on fraudulent nondisclosure, or the seller's "failure to disclose [a material fact] in the face of a legal duty to do so."[244]

However, the potential for a plaintiff to succeed on the merits in such claims is unclear. First, the plaintiff would have to prove that the energy use information was a "material fact," or that the plaintiff would not have entered the contract were it not for that misrepresentation.[245] Second, the plaintiff would have to prove that the defendant either intended to induce her to change her position by a knowing misrepresentation,[246] or negligently made the misrepresentation with no reasonable basis for believing that the disclosure was true.[247] If a plaintiff could meet her burden, she might be able to prevail in a claim against a seller or seller's broker based on a sale of a residential property.[248] However, disclosure laws may not apply to residential property depending upon the state, as is true in California. In California, there is no legal duty to disclose on the part of a residential seller.[249]

The California disclosure law *does* apply to commercial properties, but subdivision (e) also clearly states that the law "does not increase or decrease the duties, if any, of a property owner, operator, or his or her broker or agent under this chapter or alter the duty of a seller, agent, or broker to disclose the existence of a material fact affecting the real property."[250] This subdivision appears to foreclose the possibility of a private right of enforcement for nondisclosure. A seller who wished to avoid disclosure of her inefficient building would be faced, like a New York seller, with only a civil fine.[251] Furthermore, buyer's nondisclosure suits under California real estate law are based on the fiduciary duty of the seller's agent to inspect and disclose all discoverable facts.[252] This duty does this not apply in the case of commercial purchasers, who are presumed to be sophisticated parties capable of self-protection.[253]

Energy use disclosures, however, are distinct from other real estate disclosures. Unlike a disclosure of a lien or nonconforming condition, the only way energy use disclosures achieve their purpose is if purchasers are

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244. Steven W. Koslovsky, *To Disclose or Not to Disclose: An Overview of Fraudulent Nondisclosure*, 50 J. Mo. B. 161, 161 (1994).

245. Charpentier v. Los Angeles Rams, 89 Cal. Rptr. 2d 115, 122–24 (Cal. Ct. App. 1999).

246. Cal. Civ. Code § 1709 (West 2014); Gagne v. Bertran, 275 P.2d 15, 17–21 (Cal. 1954).

247. *Gagne*, 275 P.2d at 20–21.

248. Jue v. Smiser, 28 Cal. Rptr. 2d 242, 242 (Cal. Ct. App. 1994) (holding that purchasers of residential real property could sue for fraud based on a material misrepresentation on the part of the seller).

249. *See* Assemb. B. 531, § 1(b), 2009–10 Leg., Reg. Sess. (Cal. 2009).

250. *Id.* § 1(e).

251. *A.B. 1103 Frequently Asked Questions*, Cal. Energy Comm'n, http://www.energy.ca.gov/ab1103/documents/AB-1103_FAQ.pdf (last visited Feb. 2, 2015).

252. Easton v. Strassburger, 199 Cal. Rptr. 383, 389–90 (Cal. Ct. App. 1984).

253. *Id.* at 390 n.8. For a full discussion of duties in commercial real estate transactions see Kathleen McNamara Tomcho, *Commercial Real Estate Buyer Beware: Sellers May Have the Right to Remain Silent*, 70 S. Calif. L. Rev. 1571 (1997).

able to compare usage rates to similar buildings. Further, these disclosures are confidential. No diligence on the part of a purchaser would discover a building's historical energy use without the willing or legally obligated participation of the building's current owner. In order for a legal duty to be effective—here, in order for a purchaser to be able to rely on it—a deterrent must be available for noncompliance.

The parties best motivated and able to enforce such energy disclosures are those who rely on the information to make financial decisions. Therefore, energy use disclosure statutes should be modified to include an affirmative duty on the part of the seller and seller's agent to disclose energy use data for at least the prior year. Nondisclosure should give rise to a private right of action for fraudulent nondisclosure, and disclosure of incorrect information should create an inference of a fraudulent misrepresentation of material fact. Damages available to a plaintiff in successful suits could include financial damages equivalent to bringing the building up to the represented state of efficiency or rescission of the contract in extreme circumstances.

Disclosure statutes will surely provoke resistance from builders and sellers' brokers, for whom a new duty is a potential risk. Mandatory disclosure could also disadvantage owners of inefficient buildings. However, buyers, lessors, and users of buildings have made clear their preference for transparent information on building energy use.[254] Unleashing market forces on building efficiency could have a dramatic effect on raising the efficiency of both overall building stock, as well as individual buildings.

State law traditionally governs disclosures required between parties in a real estate transaction.[255] Therefore, efforts to expand selective disclosure statutes are more likely to find success in state legislatures than through federal efforts. They are, in essence, tools for use between two parties to a contract. By contrast, the purpose of general disclosure statutes is more ambiguous, encompassing parties in contract, municipal policymakers, and utility planners.[256] Furthermore, general disclosure can be by either building owners or utilities and is one of the few potential areas for federal leadership. While selective disclosure is a new duty on the part of the seller, the duty is simply to honestly reveal information that is easily attainable to the seller, but unavailable to the buyer. The potential damages of such a law could be high, but the law generally has little sympathy for parties who hide information in the face

254. *See supra* Part III.
255. *See, e.g.*, CAL. CIV. CODE §§ 1102–1102.18 (2014).
256. BOBKER, *supra* note 227, at 13–17.

of a legal duty for the sake of an advantage in a contract.[257] The case of building energy use should be no different.

Conclusion

The case for reducing energy use and GHG emissions through regulation is clear. Energy conservation and efforts aimed at reduction in GHG emissions exist in many states and national policies that have outlasted governments of both parties. Reduction efforts are an undeniable part of the regulatory landscape.

Buildings are a primary draw on the power grid. If reducing energy consumption and GHG emissions are serious policy goals, then addressing the demand from buildings must be part of the solution. Some states have shown a willingness to act towards a solution by enacting increasingly progressive building energy codes, and they have achieved impressive results. Other states have proven to be less willing, based on lack of information or a general reluctance to regulate. Advocacy and education efforts should be increased to combat this lack of information. While a national building energy code may be unrealistic, the goal of a universal progressive building energy code has the potential to return savings in both emissions and in the cost of energy use.

California's energy use disclosure program may offer a model for national regulation requiring disclosure of energy use and costs at the point of sale, lease, or loan. A disclosure program gives consumers the power to compare the cost of operations between different buildings alongside the price of purchase or lease. The requirement of such a disclosure puts a powerful selling tool into the hands of builders and owners who are willing to invest in efficiency.

Efficient buildings are in demand, even when the up-front cost is higher.[258] A robust energy use disclosure program would provide sellers with data on the potential upside of efficient buildings and provide buyers with a means to quantify long-term return on investment and to make informed comparisons when looking at buildings. The requirement would give buyers the security to expend greater up-front costs, knowing that their long-term costs will be lower than in a cheaper, less efficient building. Similarly, the requirements would motivate owners to invest in the efficiency of their buildings, knowing that they have a tool to gain a return on that investment.

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257. *See, e.g.*, Simon et al., *supra* note 242, at § 4.06.

258. *NAHB Study Reveals What Home Buyers Really Want*, Nat'l Ass'n of Home Builders (Feb. 19, 2013), http://www.nahb.org/news_details.aspx?newsID=15794 ("Nine out of ten buyers would rather buy a home with energy-efficient features and permanently lower utility bills than one without those features that costs 2 percent to 3 percent less.").

Energy use disclosure requirements may also be attractive in jurisdictions that resist prescriptive codes. As opposed to imposed requirements on builders, they are a dynamic means of mobilizing the market to attack a problem as it arises. In order for disclosure requirements to work, however, there must be proper enforcement for failures to disclose. Some jurisdictions have proposed a civil penalty for nondisclosure, but where a regulation provides for disclosure between two parties entering a contract, the party most motivated to enforce that regulation is the party harmed by its concealment. Therefore, a private right of action for misrepresentation or fraudulent nondisclosure would best enforce an energy use disclosure regulation.

Building energy codes have proven to be effective, independent of energy use disclosures. At the same time, standalone disclosure requirements for energy use would put a powerful tool in the hands of those willing to invest in efficiency, and create a market-based solution that could draw support where other regulation has faltered. Yet, the most effective means to serve the national policy goals of reducing energy use and GHG emissions would be a combination of the two systems, including widespread adoption of building energy code to create a floor for efficiency and disclosure requirements that would reward investments by opening the ceiling for market forces. Regardless of which policy is implemented, advocacy and education on both is highly desirable; the need for building energy efficiency is clear, and the potential rewards are profound.