

ARTICLE

GREEN HOME STANDARDS: INFORMATION AND INCENTIVES

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ABSTRACT

The “green building” movement began in the United States during the 1990s. In its early stages, reformers focused on minimizing adverse environmental impacts from major public, institutional, and commercial buildings. Private-sector organizations developed voluntary standards to promote green building practices, the most prominent being Leadership in Energy and Environmental Design (“LEED”). More recently, widespread interest in residential green building has developed. Several organizations have developed voluntary green home standards. A standard promulgated by the federal government, the Energy Star Certified Home, has achieved substantial market success during the past decade. This Article describes and assesses the Energy Star Home and its private-sector counterparts, including LEED for Homes, which have gained far less popular interest.

Although voluntary green standards have the potential to provide valuable and reliable environmental information, thus enabling buyers to make better decisions, Energy Star falls short with respect to an “information function” (conveying information to buyers). It considers only the energy efficiency of the structure and its heating and cooling systems, ignoring other important factors, including the location and size of the house, the lot, and the “greenness” of building materials and construction practices.

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In addition, Energy Star performs poorly with respect to an “incentive function” (encouraging producers to make better products) by allowing homebuilders to ignore many considerations bearing on a home’s greenness. This Article concludes that the federal government should reconsider the Energy Star Home program, either abandoning or greatly scaling back the program. This may allow private-sector organizations to supplant the Energy Star program with more useful, more nuanced, and more environmentally friendly green-home certification systems.

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I. INTRODUCTION

Today in the United States and in many parts of the world interest is growing in “green homes,” which consume less energy, reduce environmental impacts, and conserve land, water, and other natural resources. Thousands of homebuyers now are willing to take into account “green” environmental considerations when making home purchase decisions, motivated both by economic reasons (the prospect of lower utility bills) and by altruistic reasons (doing what’s good for the environment). But what makes one home “greener” than another? In the United States, voluntary standards have emerged to provide content to an otherwise vague ideal. A standard promulgated by the federal government, the Energy Star Certified Home, has achieved substantial market success during the past decade. At the same time, several private organizations have developed voluntary green home standards, with characteristics that are markedly different from the Energy Star program. Competition between standard-setting organizations—as in market-based economies in general—has the promise of creating value by giving buyers more choices and by giving producers incentives to design and manufacture superior products at lower prices. Voluntary standards create value in two ways; first, by communicating valuable information to buyers (the information function), and second, by encouraging producers to make better products (the incentive function). In the context of green-home standards, however, the promise is largely unrealized. Energy Star falls short both in conveying useful “green” information to buyers and in incentivizing builders to produce homes that are truly green in multiple dimensions.

Part II of this Article describes the evolution of voluntary green-building standards in the United States since their inception in the 1990s, focusing on a transition from standards for commercial buildings to standards for residential construction and single-family homes. Part III explains the key features of the Energy Star Certified Homes program operated by the federal Environmental Protection Agency, highlighting the market dominance it has achieved. Part IV critiques the existing Energy Star certification standards, noting that some of these standards push the housing market in a decidedly “non-green” direction. Part V continues my critique by placing the Energy Star program in a market context, explaining its weaknesses in providing valuable information to buyers and in incentivizing builders to produce truly green homes. I suggest that many deficiencies of the Energy Star certification program are not shared by competing programs operated by private

green-building organizations, including Leadership in Energy and Environmental Design (“LEED”).

The final part (Part VI) identifies reasons that have contributed to the shortcomings of Energy Star program; particularly prominent in this regard are the problems of agency capture, the funding of Energy Star program with federal treasury dollars, and the inevitable balancing of conflicting interests—including non-green interests—in which government officials must engage. I direct attention to a danger raised by the federal Energy Star program not previously identified, but which may be far-reaching—namely, that this government-run program is “crowding out” green-home certification programs developed by non-government pro-environmental organizations. In the end, I suggest that the federal government should reconsider its role in this field. For the past quarter century, the EPA has done valuable work by drawing attention to, and pushing forward, the green-home movement. But, in light of this past work, it may now be time for the EPA to abandon (or greatly scale back) the Energy Star program. Under current conditions, the federal government might well do more for the green-home movement by doing less. In particular, a reduced federal role might pave the way for well-credentialed private organizations to supplant the Energy Star program with more useful, more nuanced, and more environmentally friendly green-home certification systems.

II. THE GROWTH OF GREEN BUILDING STANDARDS

People have cared about the quality of their “built environment” since permanent settlements first emerged in antiquity.¹ While the built environment includes all human-made structures and spaces, buildings have always constituted a prime ingredient. Buildings obviously have enormous value, but they also reflect and create far-reaching costs. The construction of buildings, and their ongoing maintenance and use, devour massive quantities of raw materials.² Buildings cover large areas of natural and open lands. Their use and operation accounts for most of the electricity produced in the United States, as well as large shares of natural gas and water supplies.³ Buildings are a prime

1. The built environment consists of man-made physical structures and physical infrastructure in all places, urban, suburban, and rural. *See generally* RUSSELL I. LOPEZ, *THE BUILT ENVIRONMENT AND PUBLIC HEALTH* (2012).

2. Globally, buildings use 40% of raw materials. U.S. GREEN BLDG. COUNCIL, *GREEN BUILDING FACTS 2*, <http://www.usgbc.org/Docs/Archive/General/Docs18693.pdf> (last visited Apr. 21, 2017).

3. Buildings account for 72.9% of the electricity and 41.1% of the total primary energy consumed in the United States, a number that has risen from 33.7% in 1980. U.S.

contributor to greenhouse gas emissions, a concern of heightened importance in an era of global climate change. U.S. buildings emit 40% of the nation's carbon dioxide emissions, an increase from 33% in 1980.⁴ Buildings often create health risks for occupants because of contaminants including molds and toxins released from construction materials and products used inside buildings.⁵

A major focus of the environmental movement that has taken hold in the last half-century involves reducing the adverse impacts buildings have on the natural environment. Of particular importance, during the 1990s private-sector organizations promulgated "green building standards" that focused on large commercial real estate projects, including the well-known Leadership in Energy and Environmental Design—commonly referred to as "LEED."⁶ Under LEED and similar programs run by other private-sector organizations, an owner seeks to have its building or project certified by the organization as having components or features related to energy efficiency and other "green factors."⁷ Inspections of the property are required to confirm compliance with program requirements.⁸ To earn certification, the owner must secure a certain number of "points" based on the incorporation of specified "elements" in the project.⁹ Many elements are optional; for example, points may be gained if an office building is located near a mass transit station, or the owner installs bicycle racks, but these are not necessary.¹⁰ Other

DEPT OF ENERGY, 2011 BUILDINGS ENERGY DATA BOOK 1-1 (2012), http://buildingsdata.book.eren.doe.gov/docs/DataBooks/2011_BEDB.pdf. Buildings use about 21% of the natural gas and 10% of the water consumed in the United States. *Id.* at 1-1, 8-1.

4. *Id.* at 1-19. This percentage does not include emissions of buildings-related energy consumption in the industrial sector. *Id.* at 1-19.

5. See Lesley King O'Neal, Rory C. Ryan & Gregory Johansen, *Sick Building Claims*, 20 CONSTR. LAW. 16, 16 (2000) (noting that nearly 30% of all new and remodeled buildings worldwide have indoor air quality problems, an increasing source of litigation).

6. The United States Green Building Council ("USGBC"), a nonprofit organization whose members are predominantly building industry participants, developed LEED to promote green building strategies and practices. U.S. GREEN BUILDING COUNCIL, <http://www.usgbc.org/about> [<https://perma.cc/L5BN-T8J7>]. USGBC launched its pilot program in 1998. The current version, LEED Version 4, came out in November 2013. JENNIE RICHARDS, INST. FOR ENVTL. ENTREPRENEURSHIP, GREEN BUILDING: A RETROSPECTIVE ON THE HISTORY OF LEED CERTIFICATION (2012), <http://enviro.institute.org/wp-content/uploads/2012/09/GREEN-BUILDING-A-Retrospective-History-of-LEED-Certification-November-2012.pdf> [<https://perma.cc/5V2L-KJ8K>].

7. *This is LEED*, U.S. GREEN BUILDING COUNCIL, <http://leed.usgbc.org/leed.html> [<https://perma.cc/PPK4-QW9C>].

8. See *id.* ("LEED certification provides independent verification of a building or neighborhood's green features, allowing for the design, construction, operations and maintenance of resource-efficient, high-performing, healthy, cost-effective buildings.").

9. *Id.*

10. U.S. GREEN BUILDING COUNCIL, LEED FOR NEW CONSTRUCTION AND MAJOR RENOVATIONS SCORECARD (V4), <http://www.usgbc.org/credits> [<https://perma.cc/WLL9-T6>]

elements are mandatory, such as compliance with minimum insulation standards and water efficiency measures.¹¹

LEED and similar programs began on a purely voluntary basis, but states and local governments have increasingly incorporated LEED certification or similar standards into regulations governing real estate development.¹² Public regulation began at the local level, with municipalities requiring that public-sector development, such as construction of new government buildings and the like, conform to LEED standards.¹³ Some cities have gone further, insisting that private developers secure LEED or comparable green certifications, especially with regard to large-scale commercial projects.¹⁴

Little attention was paid to green standards for homes in the 1990s, although the federal government then initiated its Energy Star program for new residential construction.¹⁵ Several market factors accounted for the initial focus on green standards for commercial buildings. First, a large commercial project by itself imposes significant environmental costs, thereby presenting the potential for significant benefits from a single endeavor by reducing those costs.¹⁶ Second, “going green” with a large commercial project can create “splash value” for participants and the community, attracting media attention and fostering civic pride among local citizens.¹⁷ Third, large projects invariably involve the use of technical specialists—such as high-end architects, engineers, and environmental consultants—who are well positioned to incorporate green components into the overall

DX] (click on “Download Scorecard” button).

11. *Id.*

12. *See* U.S. GREEN BUILDING COUNCIL PUB. POL’Y LIBR., <http://public-policies.usgbc.org/> [<https://perma.cc/KFBS-5PFV>] (database housing information on policies related to green building standards and LEED at federal, state, and local levels).

13. *E.g.*, ATLANTA, GA., CODE OF ORDINANCES 75-19 to -20 (2003); BALT., MD., BUILDING, FIRE, AND RELATED CODES §§ 3702.1.6–1.7, 3703.2 (2013); San Diego, Cal., Sustainable Building Policy No. 900-14 (May 18, 2010). Some states have extended LEED standards statewide. *See, e.g.*, N.J. STAT. ANN. § 52:32-5.4 (West 2008) (beginning in 2008, all new buildings used by state governmental entities must achieve LEED silver rating or an alternative).

14. *See* Sarah B. Schindler, *Following Industry’s LEED®: Municipal Adoption of Private Green Building Standards*, 62 FLA. L. REV. 285 (2010) (contending that local green building ordinances promulgated by public bodies are preferable to ordinances that incorporate LEED standards because they can respond better to local environmental concerns through a process with greater legitimacy).

15. *See infra* Part III.A.

16. *See* Schindler, *supra* note 14, at 310–11 (noting benefits including: improved air and water quality and conservation of resources such as water, energy, building materials, and landfills).

17. *Id.* at 311.

project.¹⁸ And last, large projects have financing packages that support generous budgets, which can handle the costs associated with meeting LEED or similar standards.¹⁹

Although green building standards remain important for large-scale commercial real estate development, they are now increasingly applied to residential construction. That is not surprising when the project consists of a major multi-family development, such as a high-rise residential building, marketed as condominium apartments or rental units. After all, most of the construction techniques and energy-savings measures that could make a million-square-foot office tower eligible for certification as green can translate directly to a million-square-foot residential tower.

Recently, however, attention has turned to detached single-family homes. A growing market has emerged for green single-family homes. Homebuilders throughout the United States are seeking to capitalize on this development by touting their products as green.²⁰ Real estate brokers have begun to specialize in the green market.²¹ There are even specialized mortgage products pitched to the green-home buyers.²²

As “green house” homebuilders have moved to satisfy a growing consumer demand, a basic problem of definition has arisen: What makes a house “green”? No clear answer to this question now exists.²³ The problem resembles previous debates

18. *Id.* at 315.

19. *Id.* at 311.

20. See *Green Home Marketing: Just Do It*, BUILDER (Nov. 4, 2014), <http://www.builderonline.com/builder-100/marketing-sales/green-home-marketing-just-do-it> [https://perma.cc/VM8J-HBTR] (green home market is “growing rapidly” and is projected “to double from 2013 to 2016—from \$37 billion (27 percent of market) to approximately \$90 billion (up to 33 percent of market)”).

21. See Kari Klaus, *Buying, Selling and Marketing Green Homes: The New MLS for a New Generation of Sustainable Building*, MOTHER EARTH NEWS (Jan. 27, 2015, 2:09 PM) <http://www.motherearthnews.com/green-homes/buying-selling-marketing-green-homes-zb-cz1501> [https://perma.cc/G538-3QLB]. The National Association of Realtors offers a “Green Designation” for its members, available after the completion of coursework. See GREEN RESOURCE COUNCIL, <http://greenresourcecouncil.org> [https://perma.cc/BA4A-GN9D]. Another national organization is EcoBroker. ECOBROKER, <http://www.ecobroker.com> [https://perma.cc/G6EQ-PZQF]. Many states have brokerage firms specializing in the green market. See, e.g., FLA. GREEN HOME BROKERS, <http://www.floridagreenhomebrokers.com> [https://perma.cc/3CFQ-FD9B]; GREEN ARIZ. BROKER, <http://greenarizonabroker.com> [https://perma.cc/7E4F-3XSN].

22. For example, the EPA’s Energy Star webpage touts the Energy Efficient Mortgage (EEM), which gives “borrowers the opportunity to finance cost-effective, energy-saving measures as part of a single mortgage and stretch debt-to-income qualifying ratios on loans thereby allowing borrowers to qualify for a larger loan amount and a better, more energy-efficient home.” *Energy Efficient Mortgages*, ENERGY STAR, https://www.energystar.gov/index.cfm?c=mortgages.energy_efficient_mortgages [https://perma.cc/VW5H-ZWHW].

23. Organizations and commentators have offered alternatives. See, e.g., Keith H.

over organic foods, which after a number of years was largely clarified by the federal government's promulgation of national regulatory standards.²⁴

So far, the federal government has not developed a similar regulatory structure for green homes. Instead, multiple standards to assess green homes have begun to emerge. Currently there are three separate national systems: the federal government's Energy Star Certified Homes program, LEED for Homes,²⁵ and the National Green Building Standard (NGBS).²⁶ These three standards share common characteristics. All are voluntarily followed by homebuilders who choose to adopt them. All exceed legal requirements imposed by typical building codes.²⁷ All provide documentation through the issuance of a certificate by a

Hirokawa, *At Home with Nature: Early Reflections on Green Building Laws and the Transformation of the Built Environment*, 39 ENVTL. L. 507, 514 (2009) (defining green building as "the attempt to govern the construction process itself, involving the use of environmentally conscious building design, building methods, and materials which incorporate principles of human health and conservation of natural resources"); Trip Pollard, *Building Greener Communities: Smarter Growth and Green Building*, 27 VA. ENVTL. L.J. 125, 125 (2009) (noting that green building "includes a range of techniques, measures, and practices to increase the efficiency and reduce the environmental and health impacts of buildings"); *Green Building*, EPA, <http://epa.gov/greenbuilding> [<https://perma.cc/9ZST-HJ56>] (Green building is "the practice of creating and using healthier and more resource-efficient models of construction, renovation, operation, maintenance and demolition.").

24. Chiefly, clarity followed from the National Organic Program developed by the U.S. Department of Agriculture, implementing the Organic Foods Production Act of 1990, 7 U.S.C. §§ 6501–6522 (2012). See Valerie J. Watnick, *The Organic Foods Production Act, the Process/Product Distinction, and a Case for More End Product Regulation in the Organic Foods Market*, 32 UCLA J. ENVTL. L. & POL'Y 40, 47–48 (2014); see also Marie A. Moore, *Every Contract Tells a Story (or Should)*, PROB. & PROP., Jan./Feb. 2014, at 64 (discussing a hypothetical involving seller of peanuts who argues his peanuts are "organic" because all peanuts contain organic matter).

25. The USGBC launched its certification program for homes in 2008. For program requirements, see U.S. GREEN BLDG. COUNCIL, LEED® FOR HOMES RATING SYSTEM 1 (Jan. 2008), <http://www.usgbc.org/Docs/Archive/General/Docs3638.pdf> [<https://perma.cc/3MSH-45H4>] [hereinafter LEED FOR HOMES RATING SYSTEM].

26. The National Association of Home Builders (NAHB) developed the NGBS in collaboration with the International Code Council (ICC). The first version came out in 2008 as an industry standard. *ICC 700 National Green Building Standard*, NAT'L ASS'N HOME BUILDERS, <https://www.nahb.org/en/research/nahb-priorities/green-building-remodeling-and-development/icc-700-national-green-building-standard.aspx> [<https://perma.cc/8VLR-VHCV>] ("[NGBS] is the first residential green building standard to undergo the full consensus process and receive approval from the American National Standards Institute."). It replaced the NAHB Model Green Home Building Guidelines, developed internally in 2005. See Katy Tomasulo, *NAHB to Phase out Home Certification Under Model Green Home Building Guidelines*, BUILDER (Mar. 24, 2010), http://www.builderonline.com/building/code/nahb-to-phase-out-home-certification-under-model-green-home-building-guidelines_o [<https://perma.cc/T7B7-9FE5>].

27. Building codes regulate the physical design, structure, and components of buildings to achieve purposes such as safety, durability, and preservation of property values. See Hirokawa, *supra* note 23, at 519–21 (describing history and evolution of building codes).

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third-party expert.²⁸ None of these standards allows the homebuilder to certify compliance.

In one key regard, however, these programs operate in very different ways. The Energy Star program has captured almost the entire market for green home certification—over 98%. LEED for Homes and NGBS each represent less than 1% of the homes certified to date as green in the United States.²⁹ Due to the extraordinary market dominance of Energy Star, this Article focuses on that program, incorporating discussion of the competing national programs, as well as one regional program, for the purpose of highlighting the policy choices made by the developers of Energy Star for Homes. This Article concludes that all of the green home certification systems, including Energy Star, have some value with respect to an information function—providing useful information about house characteristics to buyers and an incentive function—encouraging homebuilders to construct greener houses; but that notwithstanding Energy Star’s market penetration, it has substantial deficiencies with respect to the quality of information it provides and the incentives it creates for homebuilders.

III. THE ENERGY STAR HOME

A. *Program History and Requirements*

The federal Environmental Protection Agency (EPA) launched Energy Star in 1992 as a voluntary labelling program to promote energy-efficient computers and monitors.³⁰ The objective was to allow buyers to identify the better-performing products. Later in the 1990s the EPA expanded the program to cover many other types of goods. The program for new homes, known as the Energy Star Certified Homes Program, began in 1995.³¹ In 1996 the federal Department of Energy became a partner of the EPA with respect to some products.³² Since then, the Energy Star home has operated as a joint program of the EPA and the Department

28. See Jawanda C. Jackson, An Exploratory Study of Three Paths to Green Homes: Energy Star Homes, LEED for Homes, and the National Green Building Standard 2, 10 (Sept. 2014) (unpublished Master’s Report, Michigan State University), http://www.spdc.msu.edu/uploads/files/Programs/CM/Housing_Education_and_Research_Center/master_sreport_greenhomes_JawandaJackson_101414.pdf [<https://perma.cc/8LK9-S4LF>].

29. *Id.* at 12.

30. EPA acted under the authority of the Clean Air Act. *Origins & Mission* ENERGY STAR, https://www.energystar.gov/about/origins_mission [<https://perma.cc/84PX-CAHH>].

31. *About the Energy Star Certified Homes Program*, ENERGY STAR, https://www.energystar.gov/index.cfm?c=bldrs_lenders_raters.nh_benefits_utilities_1 [<https://perma.cc/29UE-2RY3>].

32. *History & Accomplishments*, ENERGY STAR, <https://www.energystar.gov/about/history> [<https://perma.cc/9YFJ-98QB>].

of Energy.³³ As is the case for all Energy Star certified products, the Energy Star Homes program is voluntary.³⁴ Homebuilders may choose to participate in the program by satisfying the program requirements.

The Energy Star Homes program has evolved to keep pace with developments in building codes and construction practices. The organizations responsible for promulgating building codes periodically revise those codes to require that buildings meet higher standards with respect to features such as insulation levels, heating and cooling systems, and safety protection.³⁵ In 2006 the EPA released Energy Star Version 2, which ratcheted existing requirements and added new ones.³⁶ The EPA launched the current program, Version 3, in 2011. Version 3 tightened several of the requirements (for example, higher insulation levels for building slabs and ductwork), while also imposing new educational and credentialing requirements for builders, subcontractors, and raters (inspectors).³⁷ The program now covers all types of housing construction with two sets of rules governing different building types. One set, labelled Energy Star Certified Homes, applies to detached single-family homes and low-rise multi-family buildings.³⁸ Taller buildings are eligible for certification under a separate set of Energy Star rules called the Multifamily High Rise Program.³⁹

Energy Star, true to its moniker, focuses almost exclusively on energy use. The heating and cooling system must meet

33. *Id.*

34. *Id.*

35. For example, the International Code Council operates on a three-year cycle, publishing revised codes every three years. *Code Development Process*, INT'L CODE COUNCIL, <http://www.iccsafe.org/codes-tech-support/codes/code-development> [https://perma.cc/AW3K-B C3L].

36. *History of the Energy Star Guidelines for New Homes*, ENERGY STAR, http://www.energystar.gov/index.cfm?c=new_homes.nh_history [https://perma.cc/6G72-PETD]. The new requirements include a Thermal Bypass Checklist (TBC) inspection, a visual inspection of the insulation installation, and a requirement for right-sized HVAC systems. *Id.*

37. *See Origins & Mission*, *supra* note 30 (“Homes certified under the new requirements are at least 15% more efficient than those built to the 2009 International Energy Conservation Code (IECC), and include additional energy-saving features to deliver a performance advantage of up to 30% compared to typical new homes.”).

38. ENERGY STAR CERTIFIED HOMES, VERSION 3 (REV. 07) NATIONAL PROGRAM REQUIREMENTS 1 (2013), https://www.energystar.gov/ia/partners/bldrs_lenders_raters/downloads/National_Program_Requirements.pdf [https://perma.cc/H2AM-EE97] [hereinafter NATIONAL PROGRAM REQUIREMENTS]. All buildings with no more than four dwelling units qualify. A multi-family building with more than four dwelling units qualifies if it has no more than three stories above grade. In addition, four and five story buildings can qualify if each dwelling unit has its own heating, cooling, and hot water system and the dwelling units constitute at least 80% of the building space. *Id.*

39. *Id.*

efficiency standards, and the so-called “Thermal Enclosure System” (TES) must surpass minimum insulation values.⁴⁰ TES rules apply not only to insulation within walls and under the roof, but also to ductwork and to all doors, windows, and skylights.⁴¹ In addition, specified appliances—including dishwashers, ceiling fans, light fixtures, and light bulbs—must be EnergyStar certified.⁴² The only requirement that goes beyond projected energy consumption targets the “water management system.”⁴³ This requirement, however, has nothing to do with water conservation. Instead, it aims to avoid the accumulation of moisture within the dwelling unit. For example, driveways and yards must slope away from the house, and basements and crawlspaces must be constructed so that they will not become wet or overly humid.⁴⁴

The Energy Star program offers two alternative ways for new-home certification: the “Performance Path” or the “Prescriptive Path.”⁴⁵ The former specifies the minimum energy efficiency that the completed house must achieve after completion.⁴⁶ Energy modeling is used: computer software calculates the projected energy consumption over a one-year period, taking into account facts such as the climate zone, insulation levels, air infiltration, building orientation, and landscaping.⁴⁷ After construction the projected efficiency target must be confirmed by diagnostic testing.⁴⁸ The performance path rule incorporates an industry standard known as the Home Energy Rating System (HERS), established by the nonprofit organization Residential Energy Services Network (RESNET).⁴⁹

40. *Id.* at 3–4.

41. *Id.* at 4–5.

42. *Id.* at 2.

43. See EPA, ENERGY STAR QUALIFIED HOMES: WATER MANAGEMENT SYSTEM BUILDER CHECKLIST GUIDE 8 (2011), https://www.energystar.gov/ia/partners/bldrs_lenders_raters/downloads/Water_Management_System_Builder_Checklist_Guidebook_Rev04_v5_FINAL_508.pdf?c13a-5e69 [<https://perma.cc/4CSK-TQ45>] [hereinafter WATER MANAGEMENT SYSTEM BUILDER CHECKLIST].

44. See *id.*

45. NATIONAL PROGRAM REQUIREMENTS, *supra* note 38, at 1.

46. *Id.*

47. See ENERGY STAR CERTIFIED HOMES, VERSION 3 (REV. 07) HERS INDEX TARGET PROCEDURE FOR NATIONAL PROGRAM REQUIREMENTS (2013), https://www.energystar.gov/ia/partners/bldrs_lenders_raters/downloads/ES_HERS_Index_Target_Procedure.pdf?0544-2a1e [<https://perma.cc/XB4J-9MBB>].

48. See ENERGY STAR MULTIFAMILY HIGH RISE NATIONAL PERFORMANCE PATH REQUIREMENTS, VERSION 1.0 (2015), https://www.energystar.gov/ia/partners/bldrs_lenders_raters/downloads/mfhr/ENERGY%20STAR%20MFHR%20Performance%20Path_Version_1.0_Rev03.pdf [<https://perma.cc/4DV6-D9PF>].

49. See *What's the Big Deal About the HERS Index?*, RESNET HERS (Oct. 5, 2013), <http://www.hersindex.com/articles/whats-big-deal-index/#> [<https://perma.cc/D554-4JT8>].

The Prescriptive Path is available only if the conditioned floor area (CFA) of the house does not exceed an average size given the number of bedrooms.⁵⁰ It dispenses with energy modeling and the need for testing after the completion of construction of the house.⁵¹ Rather, the Prescriptive Path simply requires installation of the proper appliances and materials. In practical effect, compared to the Performance Path, the Prescriptive Path offers a shortcut over the Performance Path. Far less work is required to achieve certification, and homebuilders generally use it so long as the planned house size permits them to do so.

B. Market Success

After a slow start—with only 25,000 Energy Star home certifications issued from 1995 through 2000⁵²—the program has met with substantial success. In all, since the program's inception, more than 1.6 million homes have received certification.⁵³ And almost 84,000 Energy Star certified homes were built in 2015.⁵⁴ For detached single-family homes, Energy Star's market share was 10% of all new single-family homes built in 2015.⁵⁵

50. The average-size house is known as the "Benchmark Home." For example, a two-bedroom house cannot exceed 1,600 square feet, and a three-bedroom cannot exceed 2,200 feet. NATIONAL PROGRAM REQUIREMENTS, *supra* note 38, at 3.

51. *Id.* at 1.

52. EPA, 2011 ANNUAL REPORT: ENERGY STAR AND OTHER CLIMATE PROTECTION PARTNERSHIPS 11 (2012), https://www.energystar.gov/ia/partners/publications/pubdocs/2011_AnnualReport_Final_low-res_12-13-12.pdf [<https://perma.cc/GLQ5-CU5A>] [herein -after EPA 2011 ANNUAL REPORT]. From 1995 to 2000 builders constructed certified homes "at a pace that has doubled each year." EPA CLIMATE PROT. P'SHIPS DIV., THE POWER OF PARTNERSHIPS: ENERGY STAR AND OTHER VOLUNTARY PROGRAMS: 2000 ANNUAL REPORT 12 (2001). More than half—25,000—were built in 2000. *See* EPA 2011 ANNUAL REPORT, *supra* at 11.

53. EPA OFFICE OF ATMOSPHERIC PROGRAMS, CLIMATE PROTECTION P'SHIPS: 2014 ANNUAL REPORT 8 (2014), https://www.energystar.gov/sites/default/files/asset/document/ENERGYSTAR_2014AnnualReport_508.pdf [<https://perma.cc/RB6U-9KJB>].

54. *New Homes Partner Locator*, ENERGY STAR, https://www.energystar.gov/index.cfm?fuseaction=new_homes_partners_locator [<https://perma.cc/L2HR-XCMR>] (last updated Dec. 14, 2016):

National Program Indicators

1,750,670	ENERGY STAR certified homes built to date
92,760	ENERGY STAR certified homes built in 2016
83,906	ENERGY STAR certified homes built in 2015

55. *2015 ENERGY STAR Certified New Homes Market Share*, ENERGY STAR, <http://www.energystar.gov/index.cfm?fuseaction=qhmi.showhomesmarketindex> [<https://perma.cc/8LQK-6546>]. The range among states varies widely. Arizona led the nation at 49%; many states were less than 1%: Alabama, Arkansas, Kansas, Louisiana, Maine, Minnesota, Mississippi, North Dakota, Oklahoma, South Dakota, Wisconsin. Texas had by far the largest number of homes (19,063), representing 28% of the U.S. total. *Id.* (drag cursor over states on ENERGY STAR Market Share State Map to view market penetration percentages).

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Even so, the percentage of new homes being certified and the total number of certified homes both have declined in recent years. The high-water mark was 2011, when over 130,000 homes were certified, representing over 26% of the homes built that year in the United States.⁵⁶ The reason for the decline is not apparent, but one possibility involves the collapse of the U.S. housing market, which began in 2009. With a sharp drop in the rate of production of new housing, perhaps homebuilders decided that they had to do everything possible to increase the likelihood that they could sell their inventory. One strategy was to cater to specialized sets of buyers, including “green” purchasers. If so, it is not surprising that the percentage of newly sold homes with Energy Star certification rose in 2010 and 2011. Nor is it surprising that, as the housing market recovered in subsequent years, the percentage of newly sold certified homes diminished. With many more buyers now entering the market, it became easier to sell new homes without getting certification.

C. Costs and Benefits

The impressive marketplace success of the Energy Star Certified Homes program is attributable to the marketing decisions made by the EPA. From the beginning in the 1990s, the EPA has pitched its program by emphasizing energy cost savings for homebuyers. At the inception of the program, the EPA stated that certified homes would be at least “30 percent more energy efficient than homes built to the national model energy code.”⁵⁷ Later, the EPA departed from the idea that the certified home had to meet that target. Although the EPA kept the number “30” in its representation, its revised publication indicates that certified new homes deliver “uses up to 30 percent less energy than a typical home.”⁵⁸ According to the EPA’s most-current publication, the average savings appears to be 20%.⁵⁹

It is important to consider whether an Energy Star certified home delivers what the EPA promises. Little in the way of solid proof exists. An EPA study conducted in 2016 sought to estimate

56. EPA 2011 ANNUAL REPORT, *supra* note 52, at 4.

57. EPA CLIMATE PROT. P’SHERS DIV., *supra* note 52, at 12 (“In 1995, the ENERGY STAR label became available for new homes that are 30 percent more energy efficient than homes built to the national model energy code.”).

58. EPA OFFICE OF ATMOSPHERIC PROGRAMS, *supra* note 53, at 12 (emphasis added).

59. *Explore Features & Benefits: Complete Thermal Enclosure System*, ENERGY STAR, https://www.energystar.gov/newhomes/explore_features_benefits/thermal_enclosure [<https://perma.cc/A9UL-8AXH>] (“By using less energy for heating, cooling, and water heating, ENERGY STAR certified homes deliver approximately 20% savings on annual utility bills.”). Of course this implies that many certified homes in fact save less than 20%.

the incremental costs and associated savings from an Energy Star certified home under the Version 3 program.⁶⁰ It analyzed a typical house (two stories, 2,400 square feet, four bedrooms) in seven cities in hot, mixed, and cold climate zones, comparing an Energy Star home to one that met the minimum standards of two model building codes.⁶¹ In all cities but one, the study considered the alternatives of heating by gas furnace or by a heat pump.⁶² The annual utility savings ranged from a low of \$276 (Tampa, Florida, heat pump) to a high of \$1,028 (Burlington, Vermont, heat pump).⁶³ The “total upgrade costs,” including third-party verification to earn the Energy Star certificate, ranged from \$1,517 (Miami and Tampa, Florida, gas furnace) to \$2,155 (Burlington, Vermont, heat pump).⁶⁴ Across the climate zones there was substantial variation in utility savings, while the incremental costs of Energy Star certification varied little.⁶⁵

One limitation of the 2013 EPA cost-savings study, which it recognized, is that the benchmark house (meeting the 2009 ICC code), may not reflect actual construction practices for new non-certified homes. As the EPA report explained: “[T]hat code is a well-defined baseline from which costs and savings can be consistently evaluated. In contrast, standard practice often varies from code-minimum requirements (both below-code and above-code) and is therefore difficult to consistently benchmark against.”⁶⁶

A related issue is that the study indicated that the published “total upgrade costs” included third-party verification costs,⁶⁷ but failed to provide data on those costs. An earlier report indicated that costs for Energy Star verification ranged from \$175 to \$750 per house.⁶⁸ Obviously, an Energy Star certificate by itself

60. ENERGY STAR CERTIFIED HOMES, VERSION 3 (REV. 08) COST & SAVINGS ESTIMATES 3 (Oct. 1, 2016), https://www.energystar.gov/ia/partners/bldrs_lenders_raters/downloads/EstimateCostandSavings.pdf?0544-2a1e [<https://perma.cc/EZV9-2SXZ>] [hereinafter ENERGY STAR COST & SAVINGS ESTIMATES].

61. *Id.* The codes were the 2009 International Residential Code for One- and Two-Family Dwellings (IRC) and the 2009 International Energy Conservation Code (IECC), both promulgated by the International Code Council (ICC). Many local governments in the United States adopt these codes as their local building codes. *Id.*

62. The house in the coldest climate zone (Duluth, Minnesota) was modeled using only a gas furnace because heat pumps were rarely used in this community. *Id.* (“Few electrically-heated homes participate in the [Energy Star] program from this region.”).

63. *Id.* at 4. The Burlington house savings is an outlier; next high was \$732 for the Indianapolis, Indiana house.

64. *Id.*

65. *Id.*

66. *Id.* at 5.

67. *Id.*

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produces no energy savings; two identical houses built to the same Energy Star standards in the same community, one certified and one not, will generate virtually the same savings. Thus, verification costs differ from construction costs. The former confer only the status of the certificate, which has value to the homebuyer only to the extent that the third-party verification provides assurance that the builder has performed as promised.⁶⁹

IV. EVALUATION OF ENERGY STAR STANDARDS

A. *National Standards Versus Local Conditions*

One problem with the Energy Star requirements is that they are not well adapted to local conditions. The present version of the National Program Requirements divides the United States into two climate zones, identified as “Hot Climates”⁷⁰ and “Mixed and Cold Climates.”⁷¹ This approach may have the virtue of simplicity, but it imposes the same requirements for housing in a broad range of climate zones. For example, in the latter category, the same efficiency of a residential heating system is required for houses in Duluth, Minnesota; Yellowstone, Wyoming; Clayton, Georgia; and Albuquerque, New Mexico. Similarly for the “hot climates,” a heating system for a house in southern Florida or southern Texas must be just as efficient as one installed in Oklahoma City, Oklahoma or Memphis, Tennessee, even though the Floridian and the Texan are unlikely to operate the system on a regular basis.

Just as heating systems are of marginal importance in the parts of the United States with the mildest winters, air conditioning systems are of marginal importance in the coldest U.S. climates. Yet the Energy Star program goes beyond requiring the same minimum efficiencies for homes that have central heat and central air conditioning; it requires the installation of central systems.⁷² Thus, a person cannot obtain an Energy Star certification for a new home in Superior, Wisconsin, unless the home includes central air conditioning. Likewise, a person cannot build an Energy Star home in Miami without installing a central

RATING SYSTEMS—A SAMPLE COMPARISON 11 (Mar. 2008), http://www.homeinnovation.com/services/certification/green_homes/resources/~media/Files/Reports/GreenHomeRatingComparison.ashx [<https://perma.cc/E4C6-G3VZ>].

69. The efficacy of the certificate in providing information to homebuyers is considered *infra* Part V.

70. The Hot Climates are 2009 IECC Zones 1 through 3. NATIONAL PROGRAM REQUIREMENTS, *supra* note 38, at 2.

71. The Mixed and Cold Climates are 2009 IECC Zones 4 through 8. *Id.* Regional program requirements were developed for several states, including California and Florida; they supersede the national requirements. *Id.* at 1.

72. *Id.*

heating system.⁷³ This rigidity may benefit manufacturers and installers of heating, ventilation, and air conditioning (HVAC) systems. But one wonders whether it benefits anyone else.

Given the wide diversity in U.S. climate conditions, a better designed certification system would be more closely tailored to local conditions, and in at least some localities allow homebuyers to forgo the installation of central heating or central air conditioning.

B. Site Selection, House Design, and Building Materials

With one narrow exception, the focus of the Energy Star Home program is limited to energy use: (1) the efficiency of appliances installed in the residence and (2) the insulation value of building materials.⁷⁴ The exception, a requirement for moisture control, is a minor element.⁷⁵ The point of Energy Star, therefore, centers on promotion of the efficient use of resources. But it does not serve that purpose well. In many respects, Energy Star fails to account for energy expenditures, both in connection with construction of a residence and the household's use of the residence after the household takes possession.

The process of building a house, of course, consumes substantial resources including energy. The selection of the building site, or lot, and its preparation to make it suitable for the planned structure has important consequences. Some sites are "greener" choices than others with respect to the pre-completion consumption of resources. Lot location matters for many reasons. In general, building in a rural location that is geographically distant from existing transportation and utility infrastructure is more costly than building in an urban or suburban environment on a lot that already has ready access to such infrastructure.⁷⁶ The

73. Heating needs for buildings are measured by "heating degree days." For days when the average outside temperature is less than the inside temperature, the difference results in heating degree days. For example, a day when the average outdoor temperature is 30 degrees colder than the inside temperature accumulates 30 heating degree days. The annual total for International Falls, Minnesota is 10,487; for Miami, Florida 200 (Fahrenheit). CLIMATE-ZONE, <http://www.climate-zone.com> [<https://perma.cc/AD9H-2GWB>]. Of course, these two cities are flipped with respect to cooling needs. Miami has 4,198 cooling degree days; International Falls only 249. *Id.*

74. *See supra* Part III.A.

75. *See supra* note 30 and accompanying text; *Energy Efficient New Homes: Water Protection System*, ENERGY STAR, https://www.energystar.gov/newhomes/explore_features_benefits/water_management [<https://perma.cc/KM97-C4XA>].

76. *See* TODD LITMAN, VICTORIA TRANSP. POLICY INST., NCE CITIES—SPRAWL SUBSIDY REPORT: ANALYSIS OF PUBLIC POLICIES THAT UNINTENTIONALLY ENCOURAGE AND SUBSIDIZE URBAN SPRAWL 5 (Mar. 2015), <http://static.newclimateeconomy.report/wp-content/uploads/2015/03/public-policies-encourage-sprawl-nce-report.pdf> [<https://perma.cc/Z93W-PKBN>] (noting that sprawl increases annualized infrastructure costs from \$502 to

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longer the connections will be for extending electrical, natural gas, and water service to the lot, the more they will cost. This is a cost of producing the house, whether that cost is paid by the builder (and thus passed on to the buyer as part of the purchase price) or paid by the utility provider (and thus passed on to all of its customers).

If the new house is not located near water distribution and sanitary sewage systems, installation of a costly water well and a septic field will become necessary. The farther away the new house is from major highways, the higher the transportation costs for bringing building materials to the site and for workers to commute to the site to build the house. The topography of the lot also matters. Building on a lot with surface features that require little alteration is less expensive than building on a lot that requires substantial transformation. Building on hilly lots is harder than building on flat lots, and may require substantial grading and even the construction of retaining walls.⁷⁷ If the lot is heavily forested, major tree removal will be necessary. In addition to the direct economic costs of lot preparation, reflected by labor and materials used by subcontractors, such lot transformations have secondary environmental effects through the removal of trees and other natural vegetation and problems stemming from added surface water runoff, including erosion.⁷⁸

The key point is that all of these considerations bear on the efficient use of resources in building the house, together with the ancillary improvements required to make it operational. But the Energy Star program considers none of them in its certification methodology. A new house built in a remote, mountainous area, more than twenty miles away from neighbors and existing infrastructure, can earn an Energy Star certification as easily as an identical new house constructed on a vacant infill lot, located next to existing homes in an urban neighborhood.

The selection of building materials for the home also matters in assessing its “greenness.” The Energy Star system, however, gives no credit for the use of local or renewable construction materials. In noteworthy contrast, other green ratings systems give substantial credit to the use of local construction materials

\$750 per capita).

77. See *Evaluating Slope, Soils, Water & Radon*, BUILDING ADVISOR, <http://buildingadvisor.com/buying-land/site-characteristics/slope-soils-water-vegetation> [<https://perma.cc/J7F2-ER5H>].

78. See LITMAN, *supra* note 76, at 20 (noting that sprawl resource impacts include reduced farmland, reduced natural lands, higher food prices and increased dependency on imported foods, reduced wildlife habitat, less clean air and water, and reduced tourism and property values).

and renewable construction materials. LEED first employed these criteria for certifying non-residential buildings,⁷⁹ and long ago extended them to its home program.⁸⁰ So does the NGBS program⁸¹ and some of its regional analogues. Credit for local construction materials means incorporating components made from locally obtained natural resources, such as stone and timber. The “greenness” of this preference, in an economic sense, stems from the avoidance of fuel-intensive transportation costs that arise when goods are shipped long distances. Renewable materials are goods that are recycled from prior uses.⁸² For example, previously installed wood flooring is often removed when a building is demolished and reinstalled in a new building. Often such flooring is prized because the wood is of a type or quality that is no longer widely available as a new product.

C. *The Efficient Use of Resources After Occupancy*

Energy Star certification ignores what happens in connection with the planning and construction of the new house, limiting consideration to the efficient consumption of energy after the household occupies the home. One might expect that Energy Star would evaluate all feasible energy sources, but it does not do so. The Energy Star program focuses primarily on electricity and natural gas. Many U.S. homes, though a declining percentage, use oil as the heating source.⁸³ Energy Star certifies oil furnaces that meet its efficiency standards, allowing for the certification of a house heated by oil to obtain an Energy Star certification.⁸⁴

79. USGBC, POLICY BRIEF: MATERIALS AND RESOURCES IN THE LEED RATING SYSTEMS, http://www.usgbc.org/sites/default/files/PolBrief_MaterialsinLEED.pdf [https://perma.cc/5V5S-Z8AD] (allocating credit for use of regional materials, i.e., “building materials or products that have been extracted, harvested or recovered, as well as manufactured, within 500 miles of the project site”).

80. *LEED v4 Home Design + Construction Guide*, USGBC, <http://www.usgbc.org/guide/homes> [https://perma.cc/UBY4-VFSK] (“Use of local materials supports the local economy and avoids the harmful effects of long-distance transport.”).

81. NGBS GREEN HOME INNOVATION RESEARCH LABS, NGBS SCORING FOR NEW CONSTRUCTION: ICC/ASHRAE 700-2015 NATIONAL GREEN BUILDING STANDARD VERSION 3.5.0 § 609.1 (Jan. 6, 2017), http://www.homeinnovation.com/services/certification/green_homes/resources/ngbs_green_scoring [https://perma.cc/DZ2Z-NCWV] (noting points for using regional materials for major elements or components of the building).

82. See *LEED v4 Home Design + Construction Guide*, *supra* note 80 (“Reclaimed (i.e., salvaged postconsumer) materials can be substituted for new materials, saving costs and reducing resource use”); NGBS GREEN HOME INNOVATION RESEARCH LABS, *supra* note 81, § 606 (allocating points for renewable materials).

83. *Heating Oil Explained: Use of Heating Oil*, U.S. ENERGY INFO. ADMIN. (Feb. 24, 2016), http://www.eia.gov/energyexplained/index.cfm?page=heating_oil_use [https://perma.cc/YRA9-3EJP].

84. NATIONAL PROGRAM REQUIREMENTS, *supra* note 38, at 2. The allowed heating systems are gas furnaces, oil furnaces, boilers, and heat pumps. *Id.* Boilers heat the house

Although not common, some U.S. houses, including newly constructed homes, use “off grid” resources such as wood-burning stoves for heat,⁸⁵ a sector not considered by Energy Star at all. In particular, a house heated by wood is ineligible for certification.⁸⁶ Yet wood heating is by far the most popular off-grid heating source, with a dramatic increase in number of households heating with wood, reported in the last federal census.⁸⁷ Whether heating a home by burning wood is a “green choice” is contested. Advocates applaud wood as an ancient and renewable resource, often harvested locally, used at economical costs with modern stoves, with the promise of long-term sustainability.⁸⁸ Critics complain about air pollution from smoke and soot.⁸⁹ Recent litigation brought against the EPA by several states and environmental groups produced a consent decree under which the agency agreed to tighten limits on emissions from wood heaters.⁹⁰

Surprisingly, Energy Star considers only energy *consumption*, with no credit awarded for energy *generation*.⁹¹ No “plus” is awarded to a house with solar panels on its roof, even one that achieves the status known as a “net zero energy home,” which generates at least as much energy as it consumes.⁹² The failure to award credit for

by circulating hot water or steam, and are fueled by electricity, gas, or oil.

85. See Stefan Nadzo, *Heating Your Home with a Wood Stove*, MOTHER EARTH NEWS, Nov./Dec. 1976, <http://www.motherearthnews.com/green-homes/heating-with-wood-stove-zmaz76ndztak.aspx> [<https://perma.cc/Q9GZ-5CBC>].

86. The EPA regulates and certifies wood stoves. The 2015 New Source Performance Standard (NSPS) reduced the mandatory smoke emission limit to 4.5 grams of particulate per hour. Standards of Performance for New Residential Wood Heaters, New Residential Hydronic Heaters and Forced-Air Furnaces, 80 Fed. Reg. 13,672, 13,678 & tbl.3 (Mar. 16, 2015); see also EPA, CERTIFIED WOOD HEATERS LIST (Apr. 2017), <https://www.epa.gov/compliance/list-epa-certified-wood-stoves> [<https://perma.cc/VMG6-5N8P>]. Although the EPA publishes estimated energy efficiency for the stoves it certifies, it has not attached the Energy Star label to wood stoves.

87. In 2010 over 2.3 million homes used wood as their primary heat source, representing 2.1% of all U.S. homes. This was an increase from 1.6% in 2000. Many of the modern stoves burn wood pellets. During the decade, oil heat dropped 21% and propane dropped 16%. Press Release, Alliance for Green Heat, 2010 Census Shows Wood is Fastest Growing Heating Fuel in United States (Oct. 10, 2011), <http://www.forgreenheat.org/resources/press.pdf> [<https://perma.cc/LJ8N-Y6PJ>].

88. See Cheryl K. Chumley, *EPA's Wood-Burning Stove Ban Deals Blow to Rural Homes*, NEWSMAX (Feb. 18, 2014, 1:42 PM), <http://www.newsmax.com/US/heat-energy-wood-stoves/2014/02/18/id/553372> [<https://perma.cc/9JB7-GS8C>] (noting that 80% of stoves presently in use in United States do not comply with new EPA restrictions on particulate emissions).

89. See Arnold W. Reitze, Jr., *EPA's Fine Particulate Air Pollution Control Program*, 44 ENVTL. L. REP. 10996, 11018–19 (2014).

90. See *New York v. McCarthy*, No. 13-1553 (D.D.C. Oct. 9, 2013).

91. See NATIONAL PROGRAM REQUIREMENTS, *supra* note 38.

92. The computation is made on an annual basis. At times the house may consume more energy than its energy generation system produces, provided it generates a surplus at other times. For example, a solar house in a hot climate might not produce enough solar

energy generation may not be of great practical importance, in that a homebuyer who can afford solar panels is probably buying a house that has an overall high level of environmental quality, at a relatively high price, which likely otherwise qualifies for Energy Star certification, without the need for a solar energy credit. Still, Energy Star's refusal to consider energy generation sends a negative message, perhaps unintended, that it is more important to install features such as an efficient dishwasher and properly-sealed windows than it is to generate renewable energy.

Water use plays only a limited role in Energy Star certification. The house's hot water system must meet efficiency standards if water is heated by way of conventional sources—electricity or gas.⁹³ In addition, the green alternative of heating water by solar energy qualifies for certification purposes.⁹⁴ Water conservation, however, matters not at all. The EPA has developed a WaterSense program, which labels high-efficiency toilets, bathroom sink faucets, and aerators.⁹⁵ But using these efficient products is neither required nor encouraged by the Energy Star home certification program. Nor does it matter whether the home has an outdoor irrigation system, and if so, how it is designed. Some irrigation systems are much more water efficient in conserving water than others, and certification systems developed by other organizations exist to rate residential irrigation systems.⁹⁶ Even so, Energy Star fails to include this important feature in its ratings. In contrast, LEED for Homes and other green home rating systems award credit for residential water efficiency.⁹⁷

energy during the summer months, when the air conditioner runs extensively, to achieve net zero, but it may generate surpluses during other seasons. Typically, a net zero home is attached to an electrical grid in which the owner sells the electrical surplus to the utility. See Kris Hudson, *Builders' New Power Play: Net-Zero Homes*, WALL ST. J. (Jan. 15, 2015, 5:48 PM), <https://www.wsj.com/articles/builders-new-power-play-net-zero-homes-1421794129> [<https://perma.cc/Y6D7-PJSF>] (reporting that builders are beginning to market net-zero homes, as buyer demand gradually rises).

93. NATIONAL PROGRAM REQUIREMENTS, *supra* note 38, at 2.

94. *Id.* at 3 n.4.

95. See *Watersense: High Efficiency Toilet Questions*, EPA, https://www3.epa.gov/watersense/fq_toilets.html [<https://perma.cc/AA9G-AB2F>] (“The EPA specification sets the water use level at 1.28 gallons per flush or less, includes design requirements, and has a higher requirement for flush performance to ensure optimal user satisfaction.”).

96. The EPA website even acknowledges this:

Irrigation professionals certified by a WaterSense labeled program, can help you reduce your water consumption, save money, and maintain a healthy and beautiful landscape by maximizing the efficiency of your irrigation system. All too often, landscape irrigation wastes water. In fact, residential outdoor water use across the United States accounts for 9 billion gallons of water each day, mainly for landscape irrigation.

Watersense: Landscape Irrigation Professionals, EPA, https://www3.epa.gov/watersense/outdoor/irrigation_professionals.html [<https://perma.cc/UL6D-RUQB>].

97. See, e.g., USGBC, LEED FOR HOMES PROJECT SNAPSHOT, <https://greenhomeinstitute.org/wp-content/uploads/2013/09/LINC-Southtown-Rentals-Complete.pdf> [<https://>

Environmental impacts of the yard also are not considered at all in the Energy Star certification process. A newly constructed house must comply with state and local environmental regulations, which typically require measures such as the control of surface water runoff and the protection of sensitive areas by, for example, restricting the filling of wetlands and establishing a buffer to protect streams and lakes.⁹⁸ Some localities have tree ordinances and laws that restrict the proportion of impermeable surfaces and specify appropriate vegetation.⁹⁹ Some rating systems consider landscaping and other yard features, awarding credit for measures that minimize environmental impacts, such as erosion and sedimentation impacts.¹⁰⁰ Energy Star, however, takes none of these matters into account.

The location of the house has important consequences with respect to the energy use of its occupants, but Energy Star again ignores this consideration, focusing only on energy use *within* the house walls. Virtually all occupants, whether or not they are employed outside of the home, regularly go elsewhere for reasons that include shopping, recreation, socializing, and community activities. As anyone who has ever commuted to work or school knows, distance matters—and so does time. Choice also matters, as many people are willing to walk, bicycle, or use public transportation if they live in a house in a neighborhood that make such choices feasible. Some Americans have automobile commutes so lengthy that their car expenses, including gasoline, exceed what they spend on electricity at their home.¹⁰¹ Yet Energy Star considers none of this. A home build in a rural location, twenty miles from the nearest place of employment and the nearest grocery store, qualifies for Energy Star certification as readily as an identical house that is one-half block away from a subway station and in a walkable, bikeable neighborhood.

perma.cc/Y9HP-R2UC] (“LEED requires that the home incorporate a minimum number of water efficiency measures”); NGBS GREEN HOME INNOVATION RESEARCH LABS, *supra* note 81, § 801 (allocating points for measures to reduce indoor and outdoor water usage).

98. See Keith H. Hirokawa, *Sustaining Ecosystem Services Through Local Environmental Law*, 28 PACE ENVTL. L. REV. 760, 807–19 (2011) (describing local government management of watersheds and riparian habitats).

99. See *id.* at 802–07 (describing measures taken by local governments to protect trees and encourage planting).

100. See NGBS GREEN HOME INNOVATION RESEARCH LABS, *supra* note 81, § 503 (allocating lot design points for conserving natural resources, minimizing slope disturbance and erosion, storm water management, and a landscape plan that limits water and energy use).

101. *How to Save on Utility Bills and Trips to the Gas Station*, KIPLINGER (May 31, 2011), <http://www.kiplinger.com/article/spending/T063-C000-S002-how-to-save-on-utility-bills-and-trips-to-the-gas.html> [<https://perma.cc/Z6KW-GEEV>].

Notably, other green home rating systems do pay attention to the nearby transportation system and proximity to places where occupants will go. LEED first gave credit for efficient location in its program for certifying commercial buildings,¹⁰² and it later extended this approach to LEED for homes.¹⁰³ LEED also has a program for certifying residential neighborhoods as a whole, which carefully evaluates these same factors.¹⁰⁴ The NGBS home certification program similarly awards credit for favorable location of the home relative to complementary uses.¹⁰⁵ The Energy Star program, however, continues to ignore these matters.

The EPA touts Energy Star certified homes as “healthy,”¹⁰⁶ yet with only one exception its certification program does not evaluate new house components that bear on health effects for the occupants. The exception concerns a “water management system,” which Energy Star requires for certification.¹⁰⁷ Energy Star’s treatment of this subject aims to minimize moisture within the house and within its structural components.¹⁰⁸ The builder must follow specifications for the site and foundation, wall assembly, roof assembly, and building materials. Excess moisture in homes frequently leads to the growth of mold and mildew, which often causes major health problems for occupants. Excess moisture also frequently creates economic hardship for homeowners.

102. See Schindler, *supra* note 14, at 308 (describing LEED’s Alternative Transportation Credit).

103. USBGC, *LEED for New Construction and Major Renovations (v4): Location and Transportation*, <http://www.usgbc.org/credits/new-construction/v4/location-%26-transportation> [<https://perma.cc/R5B9-7MMZ>] (“The Location and Transportation (LT) category rewards thoughtful decisions about building location, with credits that encourage compact development, alternative transportation, and connection with amenities, such as restaurants and parks.”).

104. *LEED for Neighborhood Development*, LEED, leed.usgbc.org/nd.html (last visited Apr. 21, 2017); USGBC, PILOT VERSION LEED FOR NEIGHBORHOOD DEVELOPMENT RATING SYSTEM 1 (2007) (“It is the hope of the partnership that LEED for Neighborhood Development will have a similarly positive activity, improve air quality, decrease polluted stormwater runoff, and build more livable, sustainable, communities for people of all income levels.”).

105. See NGBS GREEN HOME INNOVATION RESEARCH LABS, *supra* note 81, § 501.2 (allocating points for multi-modal transportation choices including bicycle amenities, pedestrian amenities, proximity to mass transit, and proximity to parks, recreation, and retail outlets, and other facilities).

106. See, e.g., *A Green Home Begins with Energy Star Blue*, ENERGY STAR, https://www.energystar.gov/index.cfm?c=new_homes.nh_greenbuilding [<https://perma.cc/8VQP-CQHB>] (“Green building means improving the way that homes and homebuilding sites use energy, water, and materials to reduce impacts on human health and the environment.”).

107. WATER MANAGEMENT SYSTEM BUILDER CHECKLIST, *supra* note 43, at 5.

108. See *id.* at 8 (“The specifications in this checklist are designed to help improve moisture control in new homes compared with homes built to minimum code.”).

Remediation of existing moisture-plagued homes usually is possible, but often at great expense.¹⁰⁹

Apart from the issue of moisture, Energy Star does not require or incentivize health-promoting construction methods or materials. One example involves fresh air ventilation. The modern, energy-efficient home is designed to minimize air leakage to the exterior; thus, doors and windows are tightly sealed, as is the entire building envelope. This style of construction means that fresh air from the outside does not enter the house in significant quantities, which produces a build-up of indoor air pollutants that emanate from a range of activities within the house, including cooking and cleaning.¹¹⁰ This may seem ironic, in that an older, “leaky” house has the advantage of naturally expelling pollutants to the outside, replaced by a flow of outdoor air.¹¹¹ A modern sealed house, in contrast, benefits greatly from a specialized ventilation system designed for continuous exchange of indoor air for outdoor air. Several types of systems are available,¹¹² and widely used. Energy Star, however, does not require them or provide for diagnostic testing of the ventilation systems after installation.

D. House Size and Greenness

Underlying Energy Star’s focus are two major policy choices, both of which are largely invisible, at least until one imagines possible alternative regimes. Two alternatives, paths not taken, merit consideration. The Energy Star certification system has

109. See, e.g., Amanda S. Persad et. al., *A Review of Inhalation Exposure to Mold and Adverse Health Outcomes*, 19 J. LAND USE & ENVTL. L. 557, 561 (2004).

110. Organic chemicals used as ingredients in household products are a major problem. Volatile Organic Compounds (VOCs) are emitted as gases. An EPA study “found levels of about a dozen common organic pollutants to be 2 to 5 times higher inside homes than outside, regardless of whether the homes were located in rural or highly industrial areas.” *Volatile Organic Compounds’ Impact on Indoor Air Quality*, EPA, <https://www.epa.gov/indoor-air-quality-iaq/volatile-organic-compounds-impact-indoor-air-quality> [<https://perma.cc/9AXS-2A5G>]. Some of the compounds are known or suspected carcinogens. Other adverse health impacts include eye, nose, and throat irritation; headaches; fatigue; dizziness; nausea; and damage to the liver, kidney, and central nervous system. *Id.*

111. See J.M. Logue et al., *Energy Impacts of Envelope Tightening and Mechanical Ventilation for the U.S. Residential Sector*, 65 ENERGY AND BUILDINGS., Oct. 2013, at 281, 282, 290 (2013) (estimating energy savings of implementing airtightness improvements along with mechanical ventilation, concluding that highest possible level of airtightness may not be worth achieving).

112. See Martin Holladay, *Designing a Good Ventilation System*, *Green Building Advisor*, GREEN BUILDING ADVISOR: MUSINGS OF AN ENERGY NERD (Apr. 15, 2016), <http://www.greenbuildingadvisor.com/blogs/dept/musings/designing-good-ventilation-system> [<https://perma.cc/9AH4-RLJ3>] (describing four main systems and reporting that research studies show “that a high number of mechanical ventilation systems are poorly designed or installed”).

chosen to focus on energy efficiency of the house's components, as constructed, thereby ignoring two other considerations: the size of the house and how the house is actually used by the family that occupies the house. This section considers house size.¹¹³

The unit of analysis for all green certification rating systems, both commercial and residential, is the building, rather than the user or the occupant.¹¹⁴ Certainly there are practical reasons why all systems focus on the physical object that has been constructed. It is highly desirable to plan for certification during the pre-completion stages of design, architectural planning, and construction, with the knowledge that certification will be forthcoming. In other words, green certification is *ex ante*; actions taken prior to use of the asset are the sole determinants of its status.

When the asset is a house, events that transpire after completion may well show that the house underperforms or outperforms the prediction implicit in its certification in terms of its "greenness." The air conditioner or heating system may malfunction due to a design problem or defective parts. The house might burn down one week after completion, never having realized hoped-for energy savings. Or a termite infestation might compromise the tightness of the building "envelope." Nonetheless, the *ex ante* certification stands; none of these disappointing events causes a revocation.

The decision by Energy Star and the other green rating systems to focus on the building *ex ante*, however, does not ordain what building characteristics are relevant. All green certification systems assume the building as the unit of analysis and basically ignore its size. Building size in terms of square footage is irrelevant.¹¹⁵ But certification systems could consider building size. There is nothing intrinsic to the purpose of green rating that supports ignoring this factor. And in fact the square footage of a building has much to do with its real-world "greenness."

To appreciate this point, and the policy choice not taken, it is instructive to compare Energy Star for Homes with the standard, accepted measure for automobile efficiency. Most people own (or

113. The next section, Part IV.E., considers the relevance of the family, or household, that actually lives in the house.

114. Geoffrey M. White, Joshua Nichols & Jeff York, *Green Building Rating Systems and Green Leases*, in *THE LAW OF GREEN BUILDINGS* 15, 15 (J. Cullen Howe & Michael B. Gerrard eds., 2010).

115. House size can be measured by number of total rooms, or number of bedrooms, but when the objective is to assess energy efficiency, square footage more closely relates to energy consumption.

rent) both homes and automobiles.¹¹⁶ At least since the energy crisis of the 1970s, many buyers have taken a keen interest in the energy-efficiency of their automobiles. For gas-powered automobiles, the recognized standard measure of efficiency is estimated miles per gallon (“MPG”).¹¹⁷ The federal government has regulated automobile fuel efficiency since the U.S. gasoline shortages caused by the Arab Oil embargo during the 1970s.¹¹⁸ Considerations related to the environment other than MPG may matter to some buyers, but are seldom emphasized in the marketing of cars. For example, some cars will incur higher maintenance and repair costs than others; and those costs reflect the consumption of resources, with energy spent to produce those resources.¹¹⁹ But the federal government has not promulgated estimated repair cost disclosure rules; its focus is only on MPG. Likewise, a car owner’s decision to “trade up” to a new car has environmental implications. A person’s decision to continue the use of a used vehicle instead of replacing by buying a new more-efficient vehicle might be considered an energy-efficient personal choice, given the resources required for the production of the new vehicle.¹²⁰

This focus on MPG, moreover, has a critical practical effect. It means that Size Matters. This is because MPG correlates closely (though not perfectly) with vehicle size. Large, heavy vehicles almost always come with lower MPG estimates than smaller, lighter vehicles.¹²¹ A Hummer H3, for example, uses far more

116. *Resident Demographics*, NAT’L MULTIFAMILY HOUSING COUNCIL, <http://www.nmhc.org/Content.aspx?id=4708> [<https://perma.cc/N4CV-76QY>].

117. Legislation requires auto manufacturers to meet fleet wide average fuel economy standards for cars and trucks. See Jody Freeman, *The Obama Administration’s National Auto Policy: Lessons from the “Car Deal”*, 35 HARV. ENV’T L. REV. 343, 346–47 (2011) (describing history and evolution of standards).

118. *Id.*

119. See *Excessive Oil Consumption Isn’t Normal*, CONSUMER REP. (June 30, 2015, 6:00 AM), <http://www.consumerreports.org/cro/magazine/2015/06/excessive-oil-consumption/index.htm> [<https://perma.cc/4SZJ-MHMX>] (observing that most new cars consume little oil, but many models burn excessive amounts of oil, requiring owners to top off oil between oil changes).

120. This was especially true under the Obama administration’s “Cash for Clunkers” program that gave rebates to new car buyers subject to the requirement that the buyer’s trade-in be destroyed. In a normal car replacement in which the buyer trades or sells her used car, the used car finds a new owner, so the value of that resource is not lost—it’s merely transferred to another user. For a detailed description of the Cash for Clunkers program and a review of studies assessing its effectiveness based on economic, social, and environmental criteria, see Marianne Tyrrell & John C. Dernbach, *The “Cash for Clunkers” Program: A Sustainability Evaluation*, 42 U. TOL. L. REV. 467, 479–483 (2011).

121. See *Best & Worst Fuel Economy: Fuel Sippers and Guzzlers in All Vehicle Categories*, CONSUMER REP., <http://www.consumerreports.org/cro/2012/05/best-worst-fuel-economy/index.htm> [<https://perma.cc/H3PV-8ACX>] (listing MPG estimates by vehicle type demonstrates the lower MPG estimates of luxury cars and SUVs in comparison to compact and subcompact vehicles).

energy—and thus is less green—than a two-door hatchback Mini Cooper. The Hummer uses more energy, and is less green, than the Mini Cooper. Specifically, for model year 2016, the Mini Cooper predicts 33 MPG for combined city and highway use,¹²² while the Hummer lags far behind at 16 MPG for combined city and highway use.¹²³ Government disclosure rules shine a light on this difference by forcing manufacturers to publicize MPG data thus reinforcing the point that vehicle size matters.¹²⁴

A measure of efficiency for houses corresponding to MPG for automobiles would ask how much “fuel” it takes to run the house. The period of measurement should be over the course of a full year, in light of seasonal variations in heating and cooling needs.¹²⁵ As common sense suggests, big houses consume more energy than small houses, though again the correlation is not perfect.¹²⁶ Yet the Energy Star certification program, unlike MPG estimates for cars, takes no account of house size. This is a significant flaw. Because the greenness of a home, in terms of energy consumption, inversely correlates to house size (square footage), a well-tuned rating

122. The Mini Cooper’s city and highway MPG estimates are 28 and 38, respectively. *2016 MINI Cooper Hatchback MPG*, EDMUNDS, <https://www.edmunds.com/mini/cooper/2016/hatchback/mpg/> [<https://perma.cc/3DBG-JTZ2>]; see also Joseph B. White, *BMW Drops Mini Cooper Mileage after EPA Audit*, WALL ST. J. (Oct. 22, 2014, 2:58 PM), <https://www.wsj.com/articles/bmw-drops-mini-cooper-mileage-after-epa-audit-1413998204> [<https://perma.cc/F6DU-3JPK>] (revealing that the manufacturer’s estimates were overstated by as much as four miles per gallon).

123. *2010 Hummer H3*, U.S. DEPT ENERGY, https://www.fueleconomy.gov/feg/bymodel/2010_Hummer_H3.shtml [<https://perma.cc/G5A9-CYWC>]. The Hummer’s city and highway numbers are 14 and 18, respectively, for the 5 cylinder, automatic transmission version. These MPG numbers are for the 2010 model year, when General Motors ceased production. See Paul Stenquist, *Last Call for Hummer*, N.Y. TIMES: WHEELS (Apr. 8, 2010, 12:54 PM), https://wheels.blogs.nytimes.com/2010/04/08/last-call-for-hummer/?_r=0 [<https://perma.cc/7UMC-JC6V>].

124. NAT’L HIGHWAY TRAFFIC SAFETY ADMIN., NHTSA AND EPA SET STANDARDS TO IMPROVE FUEL ECONOMY AND REDUCE GREENHOUSE GASES FOR PASSENGER CARS AND LIGHT TRUCKS FOR MODEL YEARS 2017 AND BEYOND 3 (2017), https://www.nhtsa.gov/staticfiles/rulemaking/pdf/cafe/CAFE_2017-25_Fact_Sheet.pdf [<https://perma.cc/FM7C-ENLU>].

125. This translation is not exact. MPG allows a car owner to calculate annual fuel costs by estimating how many miles she expects to drive. There is a wide variation in miles driven among car owners. An annual fuel cost, based on average miles driven by all drivers, would not be a meaningful estimate for a person who drives 3,000 miles per year or another who drives 45,000 miles. To get close to MPG for house efficiency, one would ask how much a person expects to “use” the house during the coming year. That may vary widely for vacation properties, but for principal residences, most owners would be in a relatively close usage range—year round occupancy, with occasional short absences for vacations and other purposes. Moreover, most owners continue to consume some energy to take care of their houses when empty.

126. A poorly insulated 1,500-square-foot house with an obsolete HVAC system may consume more energy than a 2,100-square-foot house, but the point is that size is a major determinant of energy requirements. When other variables are equal, it is always less expensive to heat, cool, light, and maintain a smaller area than a larger one.

system for “green homes” would award a substantial premium for small size.

But they almost never do. The NGBS, like Energy Star, fails to consider house size in its criteria for certification.¹²⁷ The LEED for Homes rating system says that “size matters” and has a size adjuster,¹²⁸ but it operates in an odd—and anti-green—way. This peculiarity results from a mechanism that adjusts that number of points needed for certification based upon the ratio between number of bedrooms and building square footage.¹²⁹ A very large house is rewarded, rather than penalized, compared to a small house if the large house includes many bedrooms. In sum, LEED incentivizes the creation of more bedrooms regardless of building size. One regional rating system gives a “passing nod” to the virtue of smallness with respect to a house’s greenness. EarthCraft, an Atlanta company developed in 1999 by the Greater Atlanta Home Builders Association and Southface Energy Institute, operates a green-home certification program for southeastern states.¹³⁰ Like other certification programs, EarthCraft is structured as a point accumulation system, with an extremely long menu divided into major categories such as site planning, indoor air quality, moisture management, and resource efficiency.¹³¹ Like other programs, it designates some requirements as mandatory, and others as optional methods to earn points. The EarthCraft guidelines award up to three optional points for “total floor area of the house,” with the maximum of three going to a house with less than 1,500 square

127. See NGBS GREEN HOME INNOVATION RESEARCH LABS *supra* note 81; see also *supra* note 79 and accompanying text.

128. LEED FOR HOMES RATING SYSTEM, *supra* note 25, at xiv–xv.

129. Instead of awarding points for a small house, the LEED rating system (Version 2008) increases or decreases the number of points necessary to earn certification at the various levels (basic, silver, gold, platinum). For example, a 3-bedroom house with 1,950 square feet is neutral (no adjustment is made). A larger house with only 3 bedrooms must earn additional points for certification. Conversely, a smaller 3-bedroom house gets a break. For example, 5 more points are necessary for a 2,550 square foot house; 5 fewer points for a 1,490 square footer. *Id.* The newest version of LEED for Homes employs a similar house size adjustment, but only if the performance path rather than the prescriptive path is used for energy efficiency. It also increases the size of the benchmark (neutral) house; for example, 2,200 square feet for a 3-bedroom house. USGBC, LEED V4 FOR HOMES DESIGN AND CONSTRUCTION 48, <http://greenguard.org/uploads/images/LEEDv4forHomesandMidriseBallotVersion.pdf> [<https://perma.cc/23SA-6TAW>]. The LEED size adjustment based on the number of bedrooms seems susceptible to manipulation in that dual-purpose rooms may be counted as bedrooms, and obviously there is no post-certification requirement that the homeowner use “bedrooms” for that purpose.

130. See *Who Is EarthCraft*, EARTHCRAFT, <http://www.earthcraft.org/who-is-earthcraft/> [<https://perma.cc/M9FF-EG4R>].

131. See generally EARTHCRAFT, EARTHCRAFT HOUSE TECHNICAL GUIDELINES (2015), http://www.earthcraft.org/wp-content/uploads/2014/10/ECH-Guidelines-11_30_16.pdf [<https://perma.cc/829B-AUMV>].

feet.¹³² This sounds good, but it matters little. Certification at the lowest EarthCraft level requires 75 points; certification at the platinum level requires 125 points.¹³³ Three points is the same bonus one can get for “advanced framing” with “Ladder T-walls” at all locations (whatever that may mean).¹³⁴

Market considerations coupled with politics, probably explain the failure of Energy Star to reward the construction of small new houses, which inevitably consume less energy than other homes.¹³⁵ For decades American single-family houses have grown larger, while families have gotten smaller. Family homes have grown by 57% in size over the last 40 years.¹³⁶ The median size of new single-family homes constructed in 2014 reached an all-time high of 2,453 square feet.¹³⁷ Over the same period, average family size

132. The following table of Resource Efficiency criteria was adapted from the Innovation tab of the EARTHCRAFT HOUSE WORKSHEET (2016), http://www.earthcraft.org/wp-content/uploads/2016/05/ECH_Worksheet-27.4.16.xlsx [<https://perma.cc/GK8C-P8A3>]. Points under the Innovation tab are optional. *Id.*

RESOURCE EFFICIENCY (RE)		Points
Modular construction for entire house		5
Total floor area of house		
	A. <1,500 sq. ft.	3
	B. 1,500–1,799 sq. ft.	2
	C. 1,800–2,100 sq. ft.	1
Outside dimensions of floor plan adheres to 2' dimensions		2
Use recycled concrete or alternate material as aggregate in foundation		2
Exterior cladding and trim (≥25% recycled content material)		2
Flooring		
1.	Cork, linoleum, sealed concrete or bamboo flooring (≥20% of total floor area)	2
2.	Recycled content tiles (≥30% recycled content material on 100% of tile floor area)	3
3.	Carpet (≥50% recycled content material on ≥100% of all carpeted floor area)	2

133. *Id.*

134. The following table of Resource Efficiency criteria was adapted from the Worksheet Tab of the EARTHCRAFT HOUSE WORKSHEET (2016), http://www.earthcraft.org/wp-content/uploads/2016/05/ECH_Worksheet-27.4.16.xlsx [<https://perma.cc/QJ4Y-VMQG>].

RESOURCE EFFICIENCY (RE)		Points
Advanced Framing		
1.	2-stud corners at all locations	2
2.	Ladder T-walls at all locations	3

135. Other green rating systems, with the nominal exception of EarthCraft, have followed Energy Star in failing to incentivize the production of smaller houses, likely due to the same market considerations.

136. See U.S. DEPT OF COMMERCE, 2014 CHARACTERISTICS OF NEW HOUSING 345, <http://www.census.gov/construction/chars/pdf/c25ann2014.pdf> [<https://perma.cc/Q4LX-2C65>].

137. *Id.* In 1974 the median size was 1,560 square feet. *Id.*

has fallen from 2.97 people (1974) to 2.54 people (2014).¹³⁸ There has also been an explosion in the number of households with just one person.¹³⁹ Notwithstanding the long-term shrinkage in family size, homebuyers want to purchase large homes—albeit with green labels. They do not want to be told that buying a big house has a large carbon footprint and, for a small family, is inherently a non-green choice. And for homebuilders, it is more profitable to build and sell large, expensive homes than more modest ones.¹⁴⁰ Not surprisingly, in this environment there is little pressure on government officials to discourage the building of large homes.¹⁴¹

E. The Household as the Unit of Analysis

All green certification systems pick the building as the unit of analysis without considering the building occupants at all. This is true not only for home certifications, but for all buildings, commercial and residential. This decision, however, is not preordained. When the building is a home, the occupants comprise the household. The household, and not just the building, could serve as the unit of analysis.

For two reasons, green ratings would look very different if they reflected this approach. First, the household's actual consumption of resources would be the measure of efficiency. Instead of estimating a household's possible energy use based on building size and characteristics, what the household actually *does* with the building would be determinative. This measure, unlike existing ratings, could not be *ex ante*. Measurement based on the *ex post* behavior of the household necessarily would play a critical role.

The same choice for measuring efficiency *ex ante* or *ex post* is reflected in efficiency ratings for automobiles. The commonly accepted measure of efficiency for gasoline consumption, MPG,¹⁴²

138. *Households by Size: 1960 to Present*, U.S. CENSUS BUREAU, <http://www.census.gov/hhes/families/data/households.html> [<https://perma.cc/FM7E-ASE8>]. Family size steadily declined during most of the twentieth century. In 1960, during the Baby boom, the average size was 3.33 persons. *Id.*

139. In 1974, 19% of U.S. households had a single person (13,368,000 homes). In 2014, 28% were single-person households (34,185,000 homes). *Id.*

140. In the 20-year period from 1994 to 2014, the median contract price of new single-family homes (excluding value of improved lots) almost doubled, rising from \$117,600 to \$231,600. U.S. DEPT OF COMMERCE, *supra* note 136, at 758. In real dollars, after adjusting for inflation, this represents an increase of 23%. CPI INFLATION CALCULATOR, <http://data.bls.gov/cgi-bin/cpicalc.pl> [<https://perma.cc/XNG9-PHZB>] (calculating that \$117,600 in 1994 was worth \$187,855 in 2014).

141. *See supra* notes 139–40 and accompanying text. There may be a trade-off between government environmental policy (which ought to incentivize the production of smaller houses) and government economic policy (which is advanced by encouraging more construction).

142. *See supra* Part IV.D.

treats the asset as the unit of analysis and ignores the persons who use the car. The driver's behavior has a significant impact on the actual MPG that are achieved. Speed, driving techniques, tire inflation levels, and other factors often result in a driver getting worse mileage, or better mileage, than the published EPA estimates of MPG.¹⁴³

Both for automobiles and houses, there is a relationship between *ex ante* predictions and actual performance. The *ex ante* prediction informs the user what might be achieved, given proper use of the asset. Thus, with respect to a household's use of its house, the primary Energy Star factors correlate to the household's actual use or consumption of resources, but not closely. For example, if a household never or seldom uses an appliance (such as a central air-conditioning system in a house in Duluth, Minnesota), the energy rating of that air-conditioning system becomes irrelevant. Measurement *ex post*, based on the household's actual use of the home, corrects this flaw by focusing on the house features that really matter to the people who live there.

Does it make sense to measure greenness by taking account only of actual performance? One cost of doing so would be to negate the issuance of green certifications at the completion of construction, prior to occupancy by the household, thus removing the value of such a certificate. But measuring and certifying actual performance would have value to an "efficient household," in effect representing an achievement award. Such a certificate might well gratify its recipients, and it might have an economic value of its own—for example, an owner who decides to sell the house may use the certificate to impress potential buyers with respect to the house's green capabilities.¹⁴⁴

A second major change tied to replacing the building with the household as the unit of "greenness" analysis has to do with household size. Specifically, the relationship between household size and building size has important consequences for efficiency and

143. This is why car sellers carefully state that the MPG estimates are not representations or guarantees, to avoid potential liability for disappointed buyers who measure their actual mileage per gallon and find it falls short of the estimate. The federal government likewise advises, "Your Mileage Will Vary. EPA fuel economy estimates are based on standardized tests designed to reflect 'typical' driving conditions and driver behavior, but several factors can affect MPG significantly: How & where you drive, vehicle condition & maintenance, fuel variations, vehicle variations, engine break-in." *Your Mileage Will Vary*, FUEL ECON., http://www.fueleconomy.gov/feg/why_differ.shtml [<https://perma.cc/D9NW-FXV7>].

144. Of course, rather than performance rating replacing pre-occupancy rating, it is possible to have both types of voluntary rating systems coexist.

greenness.¹⁴⁵ Size matters, but has little meaning if viewed in isolation. Consider again the efficiency of an automobile. The MPG rating considers the asset in isolation, overlooking the persons who use the car. A different measure of efficiency might conclude the Hummer is as efficient as the Mini Cooper. A number of different measures leading to such a conclusion are possible. One could measure efficiency in terms of the accomplishment of work, as defined by the law of physics. This measure would frame the question to ask which vehicle is more efficient in transporting weight.¹⁴⁶

Measuring efficiency by capacity to move weight, however, would appear useful for the evaluation of vehicles used to transport cargo, but probably less so for passenger vehicles. A more promising measure examines actual use of the car to transport people. Suppose the Hummer regularly carries its driver plus three passengers, and the Mini Cooper regularly carries only its driver. As our measure of efficiency we may calculate the energy cost per passenger mile. By focusing only on MPG estimates, we might conclude that the Mini Cooper was approximately twice as efficient as the Hummer.¹⁴⁷ But with our new measure of efficiency, the Hummer is more efficient than the Cooper on a per passenger basis. This example shows how it is possible, when buying a car, to over rely on MPG ratings as a measure of energy efficiency. Families of a large size often select a new car that is spacious enough to carry all family members. For such a family, a minivan or large SUV may be the most energy efficient choice, and the energy cost per passenger mile may outperform the cost paid by a single person who buys a smaller car.¹⁴⁸

145. One study compared energy consumption between Energy Star and non-Energy Star homes taking account the number of household members. Pramen P. Shrestha & Prajakta Kulkarni, *Factors Influencing Energy Consumption of Energy Star and Non-Energy Star Homes*, 29 J. MGMT. ENGINEERING, July 2013, at 269, 269, 273. Not surprisingly, they found a house with more people uses more energy. "There is a significant positive correlation between number of household members and energy consumption. The correlation coefficient was 0.19 between the number of household members and electricity consumption, and the correlation coefficient was 0.32 between the number of household members and natural gas consumption." *Id.* at 273. Their data indicated a 12% savings of annual electricity per square meter (square foot) per person and a 23% savings of annual natural gas per square meter (square foot) per person for the Energy Star homes over the non-Energy Star homes. *Id.*

146. The standard equation is work = force x distance. Work measures the force applied to an object (the car) to overcome resistive force (friction and gravity). The greater the mass (weight) of the object, the more force is needed to move the object. If other variables are equal, more force is required, and thus more work is accomplished, in moving a heavier vehicle. In other words, to convert MPG ratings into a measure of work, an adjustment for mass is required.

147. See *supra* Part IV.D.

148. A family or other group uses a large vehicle efficiently when everyone would not

The same point prevails for the greenness of homes with respect to energy efficiency. To be sure, as square footage increases, so does energy consumption. But with the household as the proper unit of analysis, energy consumption might well be evaluated by taking into account household size. In other words, a house should be certified as green, or fail to achieve certification, based upon how many people live there. A 4,000 square-foot house occupied by family of ten ought to be considered greener than a 1,500 square-foot-house occupied by a single person.¹⁴⁹ Such a measure must turn on the size of the household that uses the home over a period of time, an *ex post* determination. Such a measure, however, can also serve useful *ex ante* purposes. Just as a person shops for an automobile with the knowledge of her family's present size, a person buying a house also has a plan for projected household size. Thus, one can employ an *ex ante* measure by estimating a house's per person energy cost. This blending of *ex post* and *ex ante* considerations suggests that a rating system based on a household's actual performance may retain the value inherent in the present systems, which are purely *ex ante* in nature.

V. MARKET IMPACTS: THE INFORMATION FUNCTION AND THE INCENTIVE FUNCTION

There are two ways in which certification systems provide value in the marketplace. The first is an information function. Certification schemes provide information that the buyer may use in deciding whether to purchase a product, and in particular, to make a purchase decision between competing products available in the market. Certification systems are justifiably intended to influence the behavior of buyers.

The second means by which certification systems may furnish value is an incentive function. The incentive function, in contrast to the information function, focuses on the behavior of the producers. The availability of a certification incentivizes the producer to build to the standard, partially because the certification creates value that he can sell. A well designed

fit in a smaller vehicle, necessitating the use of two smaller vehicles for the group to travel to the same destination. Similar cost-per-person calculations underlie the commonly held belief that public mass transit is a more efficient method of travel than private vehicles. It holds true only if there are enough riders. Waste results if the proportion of riders to capacity is too low. For example, a large bus with one or two passengers on board represents an inefficient use of resources. This is why bus systems monitor ridership and make changes to routes and equipment to respond to underutilized services.

149. This considers only size, and assumes that other property characteristics for the two properties that are relevant to energy consumption and greenness are equal.

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certification system not only augments the profits of producers; it also incentivizes the building of products that benefit the wider community. In the context of eco-labels or green labels, this means that the green product has positive externalities, such as decreasing overall energy consumption, reducing pollution, using public infrastructure efficiently, and protecting natural resources including water resources and undeveloped land.

A. The Information Function

The national and regional certification systems for green homes, all of which are voluntary, perform an information function. The point is to communicate information. Buyers of goods and services often encounter a hurdle of information asymmetry. Almost always, sellers know much more about the thing they are selling than does the buyer. This is inevitably true when the seller is also the manufacturer or assembler of the product being sold, as is the case for homebuilders.

Buyers of homes, just like buyers of all goods and services, want to obtain reliable information about the quality of the subject matter of their purchase. And homebuilders provide buyers with a rich mix of information about their products. But what information? One goal of the law is to help buyers to overcome built-in information asymmetries to the extent practical. Information is costly to acquire. Spending time and money to convey or to get information involves transaction costs. But transaction costs vary greatly depending on the nature of the information and other factors, including the subject matter of the parties' exchange, which has an impact on the value of the proposed purchase. All information of all types comes laden with transaction costs, but the costs vary substantially according to a number of factors. Some information is readily available at low—or, sometimes, almost zero—cost. Other information is difficult, if not impossible, to obtain.

Parties to exchanges have an incentive to reduce transaction costs to the extent it is practical to do so. From the buyer's standpoint, the issue is how much to invest in acquiring information about the property being purchased. The optimal level of investment in acquiring information depends upon the buyer's assessment of risk and the potential value of information in reducing or eliminating that risk. In other words, if the estimated value of information exceeds the estimated cost of its acquisition, it is prudent for the buyer to incur the relevant transaction cost.

One classic description of how buyers obtain information categorizes the information into three types based on when the

buyer is likely to acquire the information: search qualities, experience qualities, and credence qualities.¹⁵⁰ Search qualities relate to information known to the buyer, or readily discoverable by the buyer, prior to purchase.¹⁵¹ For a person buying a house, examples include its location, the number of rooms it contains, and the type of siding and roof. Experience qualities are discovered only after the buyer uses the product.¹⁵² Thus, the buyer learns about the product's qualities through experience. Much is learned about a purchase of food—an apple, for example—when one takes a bite and tastes it.¹⁵³

Credence qualities relate to attributes that are not readily displayed by normal use after purchase.¹⁵⁴ For example, a buyer may not be able to tell whether house components emit unsafe toxins, or whether the exterior walls include an appropriate moisture barrier and adequate insulation. It is commonly said that environmental quality is a credence good,¹⁵⁵ but this is an oversimplification. Many environmental attributes are credence qualities. It may not be possible for a person who eats an apple labelled as organic ever to verify the truth of the assertion, or whether insulation inside the walls of a house contains formaldehyde. However, some environmental attributes correlate to a performance that is measurable, in which case the characteristic should be considered an experience quality if the performance level is obvious not long after the purchase. Soon after taking possession of a house, for example, a buyer may discover that the neighborhood is noisy, or that the air conditioning system cannot cool the house adequately on a hot summer day.

The point of distinguishing search, experience, and credence qualities is that the transaction costs to the buyer of acquiring relevant information varies significantly, depending on which type of quality is at play. Most search qualities relate to information

150. Michael R. Darby & Edi Karni, *Free Competition and the Optimal Amount of Fraud*, 16 J.L. & ECON. 67, 68–69 (1973). Their classic explanation uses these terms, but most subsequent treatments refer to “search goods,” “experience goods,” and “credence goods.”

151. *Id.* at 68.

152. *Id.*

153. *Id.* at 68 & n.3.

154. *Id.* at 69.

155. See, e.g., Hajin Kim, *Eco-Labels and Competition: Eco-Certification Effects on the Market for Environmental Quality Provision*, 22 N.Y.U. ENVTL. L.J. 181, 191 (2015); Soham Baksi & Pinaki Bose, *Credence Goods, Efficient Labelling Policies, and Regulatory Enforcement*, 37 ENVTL. & RESOURCE ECON. 411, 411–12 (2007); Carolyn Fischer & Thomas P. Lyon, *A Theory of Multi-Tier Ecolabel Competition* 3–5 (Univ. of Mich. Ross Sch. of Bus. Working Paper No. 1319, 2016), <http://ssrn.com/abstract=2797256> [<https://perma.cc/7DTV-UAB3>].

that the buyer can obtain prior to the purchase at little cost. A buyer who is reasonably diligent can investigate search qualities prior to entering into a contract of purchase, and thus can avoid a product with search qualities that fail to meet her needs.

Experience qualities present different issues, in that they become apparent only after the buyer has purchased the product. At this point in time, the seller and buyer have entered into a contract, and one or both parties may have fully performed their contract obligations. When the buyer then encounters an experience quality that does not meet her expectations, a legal remedy may or may not be available. Even if a remedy is available—such as rescission, injunctive relief, or damages—the buyer must expend some effort and cost to obtain that remedy.¹⁵⁶

Credence qualities present yet another risk profile for the buyer. The problem essentially becomes one of trust. In contracting the buyer may have the benefit or representations or warranties with respect to the subject matter, but confirmation, either prior to purchase or by experience shortly thereafter, is not possible. When the issue concerns a house's environmental qualities, the buyer cannot validate the seller's claims. The buyer may simply decide to trust the seller's claims, but many consumers, especially for major purchases like homes, are skeptical of seller's unverifiable environmental claims.¹⁵⁷

Environmental certification systems run by third parties seek to bridge the trust gap between sellers and buyers. They provide information to consumers with respect to the qualities that can be ascertained only post-sale—the experience and credence qualities. Ideally, the certification points to a standard that is specific and transparent, and serves to provide a meaningful assurance to those who buy. Only if the buyer trusts the certification does it make rational sense for the buyer to prefer the certified product over its non-certified competitors. The certification of compliance

156. An advantage for the buyer, compared to a negative credence quality, is that the negative experience quality becomes apparent relatively soon after the purchase. If the seller has made a representation or warranty, or the buyer has another type of legal right, the buyer then has knowledge and information to determine whether to assert that right. Nevertheless, asserting rights is costly, even when they vindicated with or without resorting to litigation. The discovery of adverse experience qualities almost always comes too late for the buyer to avoid or recoup all follow-up costs.

157. Studies have demonstrated that consumers lack trust in environmental marketing claims. See, e.g., Arminda Maria Finisterra do Paço & Rosa Reis, *Factors Affecting Skepticism Toward Green Advertising*, 41 J. ADVERT., Apr. 2013, at 147, 153 (2012); Press Release, Whitney Dailey, Cone Comm'ns, *Consumers Take Responsibility for "Green" Actions but Aren't Following Through, According to Latest Cone Communications Research* (Apr. 2, 2013), <http://www.conecomm.com/news-blog/2013-green-gap-trend-track-er-1> [<https://perma.cc/732V-UUWP>].

with a voluntary standard thus has the potential to serve as an efficient mechanism to pass information, when the buyer has a reasonable basis for trusting the veracity of the claim.¹⁵⁸

B. The Nature and Reliability of Standards

How well a certification system performs the information function depends heavily on the nature and reliability of the underlying standards. In our context a standard is an agreed upon rule or basis of comparison for measuring one or more qualities of a product. Gold that is said to be 18-carat has a specific proportion of pure gold to alloy; organic carrots cannot be grown using chemical pesticides, chemical fertilizers, or genetically modified (“GMO”) seeds¹⁵⁹; and hardwood flooring must meet specifications for characteristics including wood grade, tolerations in thickness and width, average board length, and moisture content under a widely observed national manufacturing standard.¹⁶⁰ The key point is that a standard is more than a seller’s representation of fact with respect to the product. Advertising or marketing that describes a product’s quantity, content, performance, or other qualities does not by itself invoke a standard. But a seller who says “my product meets X standard,” unlike with other marketing, invokes an external reference (a standard) developed by and followed by a community of sellers.

The content of the standards also bear heavily on how well the certification systems performs the incentive function. Sellers have an incentive to follow standards, and to rely on them in marketing their products, to gain the trust of buyers. Especially when the claims relate to credence qualities, studies show that buyers lack trust in sellers’ claims that are not grounded in a standard.¹⁶¹ Standards come from many sources and regulate many types of

158. See Philip H. Howard & Patricia Allen, *Beyond Organic and Fair Trade? An Analysis of Ecolabel Preferences in the United States*, 75 *RURAL SOC.* 244, 249 (2010) (“[T]he most successful ecolabels rely on a third-party certification process—employing an organization without a direct financial interest in the outcome to verify the claims that are made.”).

159. Under federal law produce may be labeled organic “if it’s certified to have grown on soil that had no prohibited substances applied for three years prior to harvest. Prohibited substances include most synthetic fertilizers and pesticides.” Miles McEvoy, *Organic 101: What the USDA Organic Label Means*, *USDA BLOG* (Mar. 22, 2012), <http://blogs.usda.gov/2012/03/22/organic-101-what-the-usda-organic-label-means>. Total elimination of pesticide residue in organic crops is not generally achievable. Janet Ralof, *Organic Doesn’t Mean Free of Pesticides*, *SCIENCE NEWS* (Nov. 23, 2005, 12:41 PM), <https://www.sciencenews.org/blog/food-thought/organic-doesnt-mean-free-pesticides> [<https://perma.cc/8K5G-KZ2S>].

160. The National Wood Flooring Association (NWFA), a nonprofit trade association, has set standards and certified mills for over one hundred years. See NAT’L WOOD FLOORING ASS’N, <http://www.nwfa.org/nofma-standards.aspx> [<https://perma.cc/B2MU-N6D6>].

161. See Finisterra do Paço & Reis, *supra* note 157, at 153.

activities. There is great variance among their content, their purposes, and their reliability—and therefore their value to buyers. Industry standards fashioned solely by producers, for example, may set a low bar for quality and fail to incorporate quality-control mechanisms, such as testing or inspection. In one case, logging companies developed weak certification systems to compete with the certification of timber products by the Forest Stewardship Council (“FSC”), an international nonprofit organization which had developed a rigorous and effective certification program, supported by environmental and social groups who became FSC members.¹⁶² Another example is the Green Globes environmental assessment for commercial buildings, designed by industry insiders to allow the incorporation of non-green construction materials disallowed by LEED.¹⁶³

Oddly enough, standards have emerged to assess the quality of standards. The best known standards-accreditation firm, the American National Standards Institute (“ANSI”), facilitates and approves voluntary standards known as American National Standards (“ANS”).¹⁶⁴ ANSI also approves standards developing organizations (“SDOs”), which are then eligible to prepare standards for submission and approval as American National Standards.¹⁶⁵ SDOs apply to ANSI for accreditation, which is granted if ANSI determines that the SDO’s procedures meet ANSI’s “essential requirements for openness, balance, consensus and due process.”¹⁶⁶ ANSI has published a lengthy set of guidelines, which include open participation for any person “with a direct and material interest” in the activity in question, lack of dominance by “any single interest category,” consideration of the views and objections of all participants, voting by participants that is not “conditional upon membership in any organization,” and an impartial appeals process.¹⁶⁷ As of February 2016, 291 standards

162. See JARED DIAMOND, *COLLAPSE: HOW SOCIETIES CHOOSE TO FAIL OR SUCCEED* 473–79 (2005).

163. Green Globes began in Canada and was introduced to the United States in 2004. Green Building Initiative (GBI), a nonprofit organization, runs Green Globes and advertises it as a low-cost alternative to LEED. GREEN BUILDING INITIATIVE, <https://www.thegbi.org/> [<https://perma.cc/4EFK-BY8U>]. A coalition of industry groups founded GBI for the purpose of allowing green buildings to contain certain timber, plastic, and chemical products not allowed under LEED. *Id.*

164. Another organization is the International Social and Environmental Accreditation and Labelling Alliance (ISEAL), whose global members collaborate to improve sustainability standards. See ISEAL ALLIANCE, <http://www.isealliance.org> [<https://perma.cc/SK7A-TQDE>]; see also Schindler, *supra* note 14, at 336–38.

165. *Introduction to ANSI*, ANSI, https://www.ansi.org/about_ansi/introduction/introduction?menuid=1 [<https://perma.cc/5FBY-BQNY>].

166. *Id.*

167. ANSI, ANSI ESSENTIAL REQUIREMENTS: DUE PROCESS REQUIREMENTS FOR

developers have obtained ANSI accreditation,¹⁶⁸ with more than 10,000 approved American National Standards.¹⁶⁹

Several SDOs accredited by ANSI are active in the green building industry.¹⁷⁰ The NGBS developed by the National Association of Home Builders is an approved ANS.¹⁷¹ The U.S. Green Building Council obtained ANSI accreditation in 2006.¹⁷² LEED for Homes is not an ANS, but USGBC obtained accreditation for its LEED for Neighborhood Development as a proposed standard in 2011.¹⁷³ In collaboration with others, USGBC has obtained approval for a standard for the measurement of energy savings in buildings,¹⁷⁴ which is one component used in the LEED certification program for commercial buildings. Energy Star for Homes is not an ANS. It would not qualify, even if the EPA and the Department of Energy obtained SDO accreditation, because the agencies have not followed an open process, allowing outside interests to participate in the development and revision of the Energy Star rules.¹⁷⁵

AMERICAN NATIONAL STANDARDS 4, (Jan. 2017), https://share.ansi.org/shared%20documents/Standards%20Activities/American%20National%20Standards/Procedures,%20Guides,%20and%20Forms/2017_ANSI_Essential_Requirements.pdf [<https://perma.cc/3SXU-TUH5>] [hereinafter ANSI ESSENTIAL REQUIREMENTS].

168. *ANSI-Accredited Standards Developers*, ANSI, https://www.ansi.org/about_ansi/accredited_programs/overview [<https://perma.cc/26W6-87PN>].

169. *Introduction to ANSI*, *supra* note 165.

170. In addition to those discussed below, approved SDOs include Green Building Initiative (“standards for environmentally preferable design and construction of commercial buildings”), Institute for Market Transformation to Sustainability (“sustainable products, green buildings, clean vehicles, green power, social equity, life cycle assessment (LCA) and related activities”), Leonardo Academy, Inc. (“sustainability standards for measuring the overall sustainability performance and reduced environmental impacts of individuals, families, businesses, government, other organizations”), National Environmental Balancing Bureau (“standards that help optimize building performance”). See *ANSI-Accredited Standards Developers*, *supra* note 168.

171. *ICC 700 National Green Building Standard*, NAT’L ASS’N OF HOME BUILDERS, <https://www.nahb.org/en/research/nahb-priorities/green-building-remodeling-and-development/icc-700-national-green-building-standard.aspx> [<https://perma.cc/MM6A-NATE>]; *Sustainability*, NAT’L ASS’N HOME BUILDERS, <http://www.nahb.org/en/research/nahb-priorities/green-building-remodeling-and-development.aspx> [<https://perma.cc/89WY-KZHN>] (“NAHB supports the cost-effective, consensus-based ICC/ASHRAE 700-2015 National Green Building Standard, developed by government, environmental, and industry experts with a broad range of expertise”).

172. See *ANSI-Accredited Standards Developers*, *supra* note 168.

173. Press Release, ANSI, LEED Professional Credentials Achieve ANSI Accreditation, (Sept. 19, 2011), https://www.ansi.org/news_publications/news_story?menuid=7&articleid=8169400a-20f7-491c-872e-fd164ceae15 [<https://perma.cc/K86Q-3R7M>].

174. *ANSI/ASHRAE/USGBC/IES Standard 189.1-2009: Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, USGBC (Jan. 1, 2007), <http://www.usgbc.org/resources/ansiashraeusgbcies-standard-1891-2009-standard-design-high-performance-green-buildings-ex> [<https://perma.cc/YK66-LSQJ>].

175. See *How to Participate or Comment*, OFF. OF ENERGY EFFICIENCY & RENEWABLE ENERGY, <https://energy.gov/eere/buildings/how-participate-or-comment>

Federal antitrust legislation enacted in 2004¹⁷⁶ provides protection for “standards development organizations” that promulgate “voluntary consensus standards.”¹⁷⁷ The organization must use “agreed-upon procedures” and exhibit the attributes of openness, balance of interest, due process, an appeals process, and consensus.¹⁷⁸ The relief from antitrust liability consists of measuring the cooperative conduct of competitors under the rule of reason, rather than a per se standard, and the preclusion of statutory treble damages.¹⁷⁹ Federal law states that “industry standards . . . developed in the private sector but not in the full consensus process” are not “voluntary consensus standards” entitled to antitrust relief.¹⁸⁰

The federal antitrust legislation does not incorporate or refer to ANSI-accredited organizations or ANS. It also provides far less detail than the ANSI requirements, although both systems emphasize the same points. It is highly likely that an ANSI-approved ANS qualifies as a federal “voluntary consensus standard.” Standards developed by an ANSI-accredited SDO that are not ANSI approved, such as LEED for Homes, might qualify as well.¹⁸¹ The counterargument, which appears weighty, is that the SDO acting by itself usually will not include enough “outside” stakeholders in the standard-setting process, allow those stakeholders a vote (i.e., consensus), and provide an impartial appeals process for any disappointed stakeholders.¹⁸² In the ANSI

[<https://perma.cc/JJ7K-W6DR>]. The government allows stakeholders to offer comments, but not to participate in drafting or by voting. *Id.*

176. See 15 U.S.C. §§ 4301–4304 (2012).

177. A “standards development organization” is “a domestic or international organization that plans, develops, establishes, or coordinates voluntary consensus standards using procedures that incorporate the attributes of openness, balance of interests, due process, an appeals process, and consensus in a manner consistent with the Office of Management and Budget Circular Number A-119.” *Id.* § 4301(a)(8).

178. OFFICE OF MGMT. & BUDGET, OMB CIRCULAR NO. A-119, FEDERAL PARTICIPATION IN THE DEVELOPMENT AND USE OF VOLUNTARY CONSENSUS STANDARDS AND IN CONFORMITY ASSESSMENT ACTIVITIES § 4a(1) (1998), https://obamawhitehouse.archives.gov/sites/default/files/omb/inforeg/revised_circular_a-119_as_of_1_22.pdf [<https://perma.cc/6MBQ-JE76>]. The Circular defines “consensus” as “general agreement, but not necessarily unanimity, and includes a process for attempting to resolve objections by interested parties, as long as all comments have been fairly considered, each objector is advised of the disposition of his or her objection(s) and the reasons why, and the consensus body members are given an opportunity to change their votes after reviewing the comments.” *Id.* § 4a(1)(v). The other attributes are not defined.

179. 15 U.S.C. §§ 4302–4303.

180. OFFICE OF MGMT. & BUDGET, *supra* note 178.

181. See, e.g., Kim, *supra* note 155, at 210 n.110 (opining that an eco-label developed by producer-led NGO may constitute “voluntary consensus standards” by employing open attitude, balance of interests, due process, ability to appeal, and consensus attributes).

182. See Schindler, *supra* note 14, at 303–07 (LEED membership is “primarily populated by building industry insiders”; voting on standards is limited to members; appeals process is available for certification decisions).

process, these elements typically are satisfied by a committee established by ANSI to oversee deliberations and promulgation of the proposed ANS standard.¹⁸³

C. Framing Effects

How well a certification system advances the information function also depends on how the system *frames* the information. Green certifications are intended to convey the message that the certified product has better environmental quality than competing non-certified products. The standard that underlies each certification reflects one vision of “better” quality, among the many visions that are possible. Other standards would assess “better” differently. A green certification label frames data about the house.

Which data the standard selects and how the label frames the data are likely to affect purchase decisions made by the consumers.¹⁸⁴ Consider the Energy Star Home, which rates the house based on its probable energy consumption. The underlying data that is assembled through energy modeling and diagnostic testing includes projected annual energy use, which could be displayed both in energy units (e.g., kilowatts for electricity, therms for natural gas) and dollars necessary to purchase those energy units based on prevailing rates charged by utility companies.¹⁸⁵ But Energy Star fails to include house size in its certification metrics, instead framing the data for energy efficiency by comparing houses of equal size. A buyer of an Energy Star 5,000-square-foot certified home is told that she will save up to 30% in utility costs, but is not told that her costs would be much less for a significantly smaller house, whether or not that smaller house performed at the level for Energy Star certification.¹⁸⁶ In sum, the framing of the data sends a misleading message to buyers.

The standard framing of automobile efficiency data by MPG, which functionally takes account of car size, reflects a different judgment by those who develop and present the data. Automobile efficiency data could be framed by comparing cars of the same size, or by calculating energy cost per passenger, but it is not.¹⁸⁷ What

183. See ANSI ESSENTIAL REQUIREMENTS, *supra* note 167.

184. See Jeffrey J. Rachlinski, *Cognitive Errors, Individual Differences, and Paternalism*, 73 U. CHI. L. REV. 207, 210–12 (2006) (describing cognitive psychology experiments showing that method by which data is framed affects choice).

185. See, e.g., ENERGY STAR COST & SAVINGS ESTIMATES, *supra* note 60 (describing savings based on projected annual purchase and upgrade costs).

186. See *supra* Part III.A.

187. See *supra* Part IV.D.

accounts for the different framing decisions? The organizations that select the frames have particular objectives. The point of emphasizing MPG for cars is to encourage consumers to buy cars that have higher MPG ratings. This frame can be seen as pursuing a worthwhile objective—reducing gasoline consumption in order to conserve petroleum resources and ameliorate air pollution.¹⁸⁸ Notably, the federal government selected and promoted this frame despite vigorous opposition from industry participants, especially the car manufacturers.¹⁸⁹ Manufacturers usually earned higher profits from sales of larger, more expensive vehicles with lower MPG ratings, and they resisted federal laws that required their fleets to meet average MPGs, which the government raised periodically.¹⁹⁰

Green home labels, in contrast, appear to be driven by the objectives of industry participants. Here the incentive function and the information function work in tandem. Energy Star and the other green certification regimes incentivize builders to produce the large homes that consumers want. For decades, American families have bought bigger houses, notwithstanding a steady decline in average household size.¹⁹¹ Homebuilders are eager to satisfy that demand, with marketing that touts the virtues of their products. A substantial part of the new home market consists of existing homeowners “moving up” to a bigger, more expensive residence. Homes are like cars in that sales of bigger products usually produce more profits than sales of smaller products.¹⁹²

The framing implicit in green home labels in effect supports the strategy of marketing larger homes. Promotional materials are pitched toward the growing numbers of consumers who respond positively to goods and services that they perceive as environmentally friendly. The Energy Star certification frames data to persuade consumers that they are helping out the environment and reducing carbon emissions when they buy an

188. See Freeman, *supra* note 117, at 346–47 (describing development of Corporate Average Fuel Economy (“CAFE”) standards).

189. See DANIEL SPERLING & DEBORAH GORDON, TWO BILLION CARS: DRIVING TOWARD SUSTAINABILITY 47, 192–93 (2009).

190. The federal MPG regulations differ from green home standards in two key respects. Not only are disclosures of MPG estimates mandatory, rather than optional (voluntary), but the MPG regulations force manufacturers to meet fleet MPG targets. See Bill Vlasic, *U.S. Sets Higher Fuel Efficiency Standards*, N.Y. TIMES (Aug. 28, 2012), <http://www.nytimes.com/2012/08/29/business/energy-environment/obama-unveils-tighter-fuel-efficiency-standards.html> [<https://perma.cc/F7S6-84TB>]. They combine information-providing rules with conduct-limiting rules.

191. See *supra* notes 135–41 & accompanying text.

192. See *supra* note 140 and accompanying text.

Energy Star home without consideration of its geographical location, where the building materials come from, or its size compared to the buyer's household size.

VI. REFORMING GREEN HOME CERTIFICATION SYSTEMS

A. *Energy Star's Advantages over Competitors*

Energy Star's market dominance is due to several factors. As previously described in Part V.C., Energy Star's decisions as to its framing of data have persuaded many buyers that Energy Star Homes are truly "green homes," despite its narrow focus on energy efficiency.¹⁹³ Other factors are competitive advantages that Energy Star has over its private-sector counterparts that stem from its identity—in particular, its identity as a federal program and its program history. Energy Star first achieved widespread public recognition of its brand by certifying goods, including computers and refrigerators, which has spilled over to confer a competitive advantage for Energy Star Homes. Certification labels have much in common with trademarks. Their market purpose is similar. A trademark functions to inform consumers as to the source of goods or services, seeking to capitalize on the consumers' familiarity based upon positive prior experience.¹⁹⁴ It conveys valuable information at a low cost. A certification label, while not identifying the source (many competitors may meet the standard and obtain the right to use the certification), likewise is designed to convey information to consumers about product quality.¹⁹⁵ To be sure, all trademarks are not equal in economic value. Marks for products that have captured a large market share have tremendous economic value. Indeed, modern trademark law confers extra protection for "famous" trademarks.¹⁹⁶ Certification labels and trademarks, in addition to a shared market purpose, often have a shared legal protection. A label becomes a protected trademark when it functions to distinguish a product from competing products.¹⁹⁷ The U.S. Green Building Council has registered several LEED marks with the federal Patent and

193. See *supra* Part V.C.

194. See Mohammad Amin Naser, *Re-Examining the Functions of Trademark Law*, 8 CHI.-KENT J. INTEL. PROP. 99, 99, 104 (2008) (describing and critiquing "the orthodox definition" that "sees trademarks as being identifiers of quality providing consumers with information about the quality of their products, and based on the consumer's previous satisfaction when making purchases").

195. See *supra* Part V.A.

196. See, e.g., 15 U.S.C. § 1125(c) (2012).

197. See 1 MCCARTHY ON TRADEMARKS AND UNFAIR COMPETITION §§ 3:1--2 (4th ed. 2016).

Trademark Office.¹⁹⁸ The EPA obtained federal registration for “Energy Star” in 1996 and for its design logo in 2009.¹⁹⁹

Energy Star is a famous mark, with widespread recognition among consumers dating back to its first uses to identify energy-efficient computers and monitors. Since 2000 the EPA has conducted a national survey each year to measure consumer awareness of Energy Star. The latest survey shows 89% of households recognize the Energy Star label, and of that percentage, 84% had a high or general understanding of the label’s purpose.²⁰⁰ The survey reports that 45% of households knowingly bought an Energy Star-labeled product in the past year, with 77% of that group reporting that the label influenced their purchase decision “very much” or “somewhat.”²⁰¹ Clearly Energy Star is a powerful mark.

The EPA, like many private-sector owners of valuable marks, capitalized on the value and goodwill of Energy Star by extending it to a new product, the Energy Star Home.²⁰² This gave the government a substantial advantage over its competitors. The U.S. Green Building Council is following a similar strategy in expanding its green certification from commercial buildings to residential buildings.²⁰³ It could have developed a new certification

198. The registered marks are LEED (word; 2003), LEED (logo; 2010), LEED for Homes (2010), LEED Silver (2011), LEED Gold (2011), LEED Platinum (2011). *See, e.g.*, LEED, Registration No. 2763993; LEED FOR HOMES, Registration No. 3818882; LEED SILVER, Registration No. 3953335. The most recent registrations explain: “The certification mark, as used or intended to be used by persons authorized by the certifier, certifies or is intended to certify that a commercial, institutional or residential building, neighborhood or development has met certain design, construction, operations, and maintenance standards adopted by the U.S. Green Building Council.” LEED GOLD, Registration No. 3953334.

199. ENERGY STAR, Registration No. 1999485, ENERGY ENERGY STAR, Registration No. 3575484.

200. ENERGY STAR, NATIONAL AWARENESS OF ENERGY STAR FOR 2014: ANALYSIS OF 2014 CEE HOUSEHOLD SURVEY ES-1 (2015), https://www.energystar.gov/ia/partners/publications/pubdocs/National_Awareness_of_ENERGY_STAR_2014_v6_508.pdf?d519-671a [<https://perma.cc/E4VN-9VK3>].

201. *Id.* at ES-1 to 2. Household awareness of Energy Star has risen steadily over time. Ten years earlier 64% of households recognized the label, with 68% of those reporting a high or general understanding of the label’s purpose. ENERGY STAR, NATIONAL AWARENESS OF ENERGY STAR FOR 2004: ANALYSIS OF CEE HOUSEHOLD SURVEY ES-1 (2005), https://www.energystar.gov/ia/news/downloads/awareness_survey_2005.pdf [<https://perma.cc/P6HC-5N22>].

202. The EPA’s survey asks questions about product associations with the Energy Star label. Twenty-two percent recognized the label as applied to newly built homes. Twelve products (all goods) were more highly recognized, with refrigerators topping the chart at 88%. The lowest was roofing material at 9%. *Id.* at 10–11. This data suggests that Energy Star for Homes has leveraged Energy Star’s earlier widespread recognition with respect to goods.

203. Taryn Holowka, *Residential Offerings Expanded at Greenbuild 2016*, USGBC (May 13, 2016), <http://www.usgbc.org/articles/residential-offerings-expanded-greenbuild-2016> [<https://perma.cc/W2EM-KVHJ>].

label, but instead employed the term “LEED for Homes” and “LEED for Neighborhood Development,” hoping to capitalize on the market recognition it had previously achieved for its commercial building usages.

The story of Energy Star for Homes raises questions about the proper role of government in environmental certification. The broad issue is this: What is the proper mix between government and the private-sector activity in the green-home field? Scholars often depict voluntary standards and certifications as a private governance model that serves as an alternative to government regulation,²⁰⁴ with the implication that this is a virtue. The idea is that traditional government regulation, so-called command-and-control, leaves insufficient room for innovation.²⁰⁵ The minimum level of quality required by the government becomes a baseline, with firms having little incentive to compete in providing higher levels of quality. This reduces consumer choice with respect to different quality levels that they may desire. In contrast, a regime of private certifications based on voluntary standards fosters competition by allowing firms to operate in the market through the development of differing standards. Resulting experimentation produces winners and losers. Some standards and certifications gain market acceptance; others do not, resulting in what classical economics applauds as wealth maximization.²⁰⁶

In the context of the certification of green homes, the lines between private governance and public regulation are not sharply delineated. Whereas scholars often differentiate between government regulation and private-sector governance, in this context an “either-or” choice is untenable. Government regulation of the environmental qualities of housing has long existed in the traditional command and control format, and it is not going away.

204. See, e.g., Kim, *supra* note 155, at 197–99 (eco-label certification may foster competition among producers with respect to environmental quality, reducing incentives for government regulation); Tracey M. Roberts, *The Rise of Rule Four Institutions: Voluntary Standards, Certification and Labeling Systems*, 40 *ECOLOGICAL L.Q.* 107, 124–29 (2013) (explaining that voluntary standards, certification and labeling systems facilitate the exchange of entitlements by substituting for government at each stage of the regulatory process).

205. See Daniel A. Farber, *Breaking Bad? The Uneasy Case for Regulatory Breakeven Analysis*, 102 *CALIF. L. REV.* 1469, 1472 (2014) (“[C]ommand-and-control regulation has well-known strengths (uniformity, clear notice, improved use technology) and drawbacks (limited innovation, ‘locked in’ inferior technologies, difficulties and expense in updating requirements).”).

206. See Anne Cole & Jane Harris, *Rising Interest in Credence Qualities in Agricultural Products and the Role for Government* 6–10 (Austl. Agric. & Res. Econ. Soc., Paper No. 137828, 2005), http://ageconsearch.tind.io/record/137828/files/2005_cole.pdf [<https://perma.cc/RAB2-XQST>] (discussing the use of signaling, like certifications, to avoid market failure from an abundance of low quality products, and thus maximize economic wealth).

Building codes in urban settings are more than a century old.²⁰⁷ Long ago they evolved beyond regulations narrowly addressed to short-term health and safety concerns (e.g., fire codes, buildings that will not collapse) to include minimum levels for insulation and durability. Government at all three levels—federal, state, and local—regulates housing quality.²⁰⁸

In this regulatory environment, voluntary standards serve a useful role only if they exceed regulatory requirements. It makes no sense, for example, for a point-based green home certification system to award credit for the absence of asbestos insulation or lead paint, both of which the federal government banned decades ago. Notably, the presence of command-and-control regulation in this setting necessitates the periodic revision of certification programs to stay ahead of the often-shifting regulatory baseline. A gap must be maintained between green building voluntary standards and evolving building and environmental codes, which typically are revised on a three-year cycle. The first version of Energy Star for Homes lasted for ten years, with new versions coming out both in 2006 and 2011.²⁰⁹ The revision process adds complexity, making it harder for consumers to understand the meaning of particular certifications. For example, a consumer deciding whether to buy a new Energy Star Home or a used home, completed in 2010 and then certified as Energy Star, might conclude that they are equivalent with respect to relevant energy-efficiency considerations. But they are not, because the 2010 home would have been certified under Energy Star Version 2, a lower standard than Energy Star Version 3.²¹⁰

The relationship between the voluntary standard and the regulatory floor puts the government in an odd position when the government also is a competitor in the market for voluntary standards. The government's decision to develop and promote Energy Star as a voluntary standard may have displaced private-sector standards. Arguably, the existing green home certification systems would have achieved more market success, and other private organizations may have developed other competing certification labels, but for Energy Star's extreme

207. See Hirokawa, *supra* note 23, at 519–20.

208. See JAMES A. KUSHNER ET AL., HOUSING AND COMMUNITY DEVELOPMENT 77–93 (4th ed. 2011).

209. See *supra* Part III.A.

210. Similarly, an older Energy Star appliance often consumes more energy than a new noncertified appliance. A study concluding that Energy Star homes in Henderson, Nevada, consumed less energy than non-Energy Star homes also found that the age of appliances significantly correlated to energy consumption. Shrestha & Kulkarni, *supra* note 145, at 269, 277 (explaining that older air conditioners, dishwashers, and clothes dryers use more energy, “irrespective of whether they are ES-rated”).

market dominance. Wholly apart from this “crowding out” effect, the government’s dual role as regulator and voluntary standards competitor may confer a competitive advantage that is unfair. Not only does the EPA have the subsidy of tax dollars to develop and run the Energy Star program, it might behave opportunistically in setting the level of government regulation vis-à-vis the voluntary standards so as to maximize its market share. Although much government regulation is at the state and local government, the federal government is highly effective in inducing other levels of government to update their building and environmental codes through the use of its spending power.

Last, Energy Star certification of homes is accomplished through the use of private-sector participants. The EPA does not inspect Energy Star homes or issue Energy Star certificates to purchasers. Rather, it invites homebuilders to apply to become “Energy Star partners” at no cost.²¹¹ The builders are required to complete mandatory training and they are then allowed to use Energy Star promotional materials.²¹² Builders who commit to build only Energy Star homes receive special recognition on the EPA’s Energy Star webpage.²¹³ Unlike many goods that bear the Energy Star label, homebuilders are not allowed to self-certify the homes they complete. Self-certification has raised concerns about fraud in some settings.²¹⁴ EPA licenses private companies to serve as “raters” who inspect and certify the builders’ homes. The Energy Star program may well have an appropriate balance of EPA monitoring and supervision and private-sector partners, builders and raters, but the mix raises additional concerns of crowding out private-sector green home certifications. The EPA does not prohibit its approved builders from selling homes that are LEED-certified or that bear other private-label certifications, or its raters from assessing compliance with other standards, but it is likely that many Energy Star partners find it in their self-interest to limit their work to the product that so widely dominates the green home market.

211. See NATIONAL PROGRAM REQUIREMENTS, *supra* note 38 (“Builders are required to be ENERGY STAR partners and complete the online Version 3 Builder Orientation.”).

212. *Id.*

213. See, e.g., *Builders in Georgia*, ENERGY STAR, http://www.energystar.gov/index.cfm?fuseaction=new_homes_partners.showAreaResults&s_code=GA&msa_id=all [https://perma.cc/N96P-NE5X].

214. See U.S. GOV’T. ACCOUNTABILITY OFF., GAO-10-470, COVERT TESTING SHOWS THE ENERGY STAR PROGRAM CERTIFICATION PROCESS IS VULNERABLE TO FRAUD AND ABUSE 8 (2010) (describing how the GAO obtained Energy Star certifications for fifteen bogus products allegedly manufactured by four bogus companies).

B. The Incentive Function and System Design

The information function, by which certification regimes provide information to consumers, may operate either through a binary system, with a single form of recognition, or a tiered system, with multiple recognized levels of performance.²¹⁵ This choice has a direct relationship with the incentive function; the design of certification systems determines whether producers are incentivized to produce to a single standard, or are incentivized to select among a menu of calibrated standards.

Multi-tier systems use graduated performance levels. The product meeting the higher level costs more to produce and offers more environmental benefits than the basis level. The consumer is given a choice as to how much to invest in the greenness of the product. The best known eco-label tiered system is the LEED system for buildings, which has four levels: Certified, Silver, Gold, and Platinum.²¹⁶ When extending LEED to homes, USGBC copied its four levels developed earlier for commercial buildings.²¹⁷

On the supply side, a tiered system has the potential of being more inclusive than a binary system because individual firms, with varying cost structures and business models, can decide what level best suits their purposes. For example, a firm with a lower cost of improving environmental performance than most of its competitors is likely to opt to produce the highest-rated product. On the demand side, a tiered system may increase demand because consumers vary in their willingness and ability to pay extra for green products. A consumer who prefers greener products, but not as much as the most fervent environmentalists, may buy at the basic level.

In markets in which there are competing certification systems, binary and tiered systems may coexist, as is the case today for green homes.²¹⁸ The analysis above suggests that a tiered

215. Calling the latter a “unitary system” seems a better phrase, but the literature has used “binary system” to point to a label that signifies a product meets a threshold of performance. See, e.g., Fischer & Lyon, *supra* note 155, at 3. Presumably “binary” is not oxymoronic because it includes the class of non-qualified, non-labeled products.

216. *Id.*

217. LEED, USGBC, <http://www.usgbc.org/LEED> [<https://perma.cc/NB8J-7FRW>].

218. Fischer and Lyon present an economic model considering a non-governmental organization (NGO) and an industry trade association that both sponsor competing ecolabels. The NGO seeks to maximize environmental benefits, and the trade association seeks to maximize industry profits. Although either may select between multi-tier labels and a binary labels, they conclude that an equilibrium results in which the NGO selects a binary minimum quality standard and the industry group selected a higher binary standard. Their assumptions include that it is costless to create labels and to certify products, and that there are no errors or mistakes with respect to compliance or certification. See generally Fischer & Lyon, *supra* note 155.

certification system has the potential to outperform a binary system, gaining a greater market share. Yet it is striking that Energy Star, a binary system, has almost the entire market share for certifying green homes,²¹⁹ while LEED for Home, although recently gaining some market acceptance, still has an extremely small share.²²⁰

Why has Energy Star come to dominate this market? Perhaps the reason has to do with the inherent advantages Energy Star has as a government program or the robustness of its famous mark. Another possible explanation stems from the tiered nature of the LEED certifications. When a multi-level certification sponsor competes with a binary certification sponsor, one might expect that the strategy would be to capture market share on both sides of the binary quality standard, i.e., setting the lowest level at a standard that is easier for a firm to achieve than the competing binary standard, and setting the highest level at a standard that outperforms the binary standard. In fact, the weaker Energy Star certification is achievable at a far lower cost than the most basic LEED level, the LEED Certified Home.²²¹ And part of the cost differential is due to public subsidy. Unlike LEED for Homes, the EPA charges neither a registration fee for a homebuilder to become an Energy Star “partner” nor a certification fee for the issuance of an Energy Star certification for a new home.²²² The only cost is for verification: the fee paid to the third-party rater who is approved by the EPA to verify compliance with the standards.²²³ The EPA obviously incurs expenses with respect to operation of its partners’ program and the issuance of certificates. But all of the costs are paid by taxpayers through the federal budget.

It may be sensible for the USBG not to offer a certification level that undercuts Energy Star’s quality standard. That would

219. See *supra* Part III.

220. The competition between the green certification organizations bears analogies to the field of regulatory competition, which analyzes decision-making when private actors (persons being regulated) can make choices as to which regulatory regime will govern their transactions. See Paul B. Stephan, *Regulatory Competition and Anticorruption Law*, 53 VA. J. INT’L L. 53, 69–70 (2012) (concluding that regulatory competition among nations in their treatment of international bribery probably is preferable to “regulatory coordination” that results in a uniform standard).

221. The verification and certification costs for Energy Star appear to be less than \$1,000. See *supra* notes 67–69 and accompanying text. LEED costs are much higher; the range appears to be approximately \$4,000 to \$10,000. See Rebecca Firestone, *LEED for Homes: Is it Worth it?*, GREEN COMPLIANCE PLUS (July 5, 2011), <http://greencomplianceplus.markenglisharchitects.com/blog/2011/07/05/leed-homes-worth/> [<https://perma.cc/D88A-J4S5>]; NAT’L ASS’N FOR HOME BUILDERS RESEARCH CTR., *supra* note 68, at 9.

222. *Join Energy Star as a Residential New Construction Partner*, ENERGY STAR, https://www.energystar.gov/index.cfm?c=bldrs_lenders_raters.nh_join [<https://perma.cc/T6C3-45AT>].

223. See *supra* Part III.C.

make a LEED certified home much less exclusive than it is today, arguably diminishing its overall brand reputation. Nonetheless, a decision to keep LEED certification exclusive and relatively expensive may be accompanied by a concession that a small market is the target. And that small-market focus may well result from the competitive advantage afforded to Energy Star in the general certification market by government subsidization.

On the supply side, the new housing industry functions differently from many other industries in which goods are produced for consumption. For inexpensive goods that are regularly purchased by consumers, firms necessarily make decisions about whether to use eco-labels without negotiating with potential purchasers ahead of time. Mass-marketed organic vegetables and eco-friendly laundry detergents provide examples. The housing industry, however, is more diverse and more complex. Many builders mass produce new homes, constructing standardized products that they attempt to sell only after making planning and design decisions.²²⁴ Many other homebuilders, however, are custom home builders that begin construction only after a buyer is identified and has entered into a contract with the builder that incorporates the buyer's personalized design decisions.

Most custom homes are more expensive—and often far more expensive—than mass-produced homes. And the added expense may result in part from the incorporation of high-priced green-home features. This fact may explain why, as a historical matter, the vast majority of green-certified homes have been built in the custom sector (although this may be changing somewhat for Energy Star Homes).²²⁵ In the typical transaction, the builder does not make a decision to obtain any type of green certification before negotiation with the buyer. The green builder may advertise

224. The iconic example is Levittown, a planned suburban community started in Long Island, New York, in 1947. Levittown was the first major mass production effort. Levittown, a huge commercial success, has since become popularly identified as epitomizing negative characteristics of suburbia such as architectural uniformity and social conformity. See KENNETH T. JACKSON, *CRABGRASS FRONTIER: THE SUBURBANIZATION OF THE UNITED STATES* 234–43 (1985) (discussing the history of Levittown; geographical and social characteristics of post-World-War-II suburbs); Crystal Galyean, *Levittown: The Imperfect Rise of the American Suburbs*, U.S. HIST. SCENE, <http://ushistoryscene.com/article/Levittown> [<https://perma.cc/7QTH-U63U>].

225. Energy Star now touts its homebuilder partners who have committed to building only Energy Star homes. See ENERGY STAR, http://www.energystar.gov/index.cfm?fuseaction=new_homes_partners locator [<https://perma.cc/E97V-26N6>]. One cannot tell from the Partner Locator webpages how many of these builders are custom builders and how many are engaged in mass production. At least some partners are mass producers. See, e.g., *PulteGroup—Law Vegas*, ENERGY STAR, https://www.energystar.gov/about/content/pultegroup_las_vegas [<https://perma.cc/QU34-Y3T7>]. Pulte is one of the nation's largest homebuilders. PULTEGROUP, <https://www.pulte.com/> [<https://perma.cc/78QM-ZJVD>].

expertise in green homes, and offer a menu of choices, but decisions on environmental quality, together with a decision whether to get a certification, are made based on the buyer's preferences and willingness to pay whatever premium is necessary. The point is that green certification organizations, when they market to firms, generally do not persuade firms to produce certified homes and then attempt to sell them. Few if any custom homebuilders construct only LEED-certified homes.²²⁶ The market for green-certified homes is driven not by firms' supply-side decisions; it's driven by buyers' demand-side decisions.

On the demand side, one might also question whether multi-tier labelling systems are as efficient in transmitting information to consumers, overcoming information asymmetry, as binary systems. Having multiple certification levels imposes an additional cost on consumers to process information. The question, "Do you want an Energy Star Home?" is much simpler than, "Do You want a LEED Home, and if so, at which of the four levels: Certified, Silver, Gold, or Platinum?" The cost is necessary to determine the qualitative differences between the quality levels. At first, homebuyers who are not already quite familiar with LEED are not likely to know the relative ranks of the "metal" levels.

C. The Case for Abandoning or Curtailing the Energy Star Home Program

Voluntary standards, produced by organizations that are transparent and accommodate multiple points of views articulated by diverse interested persons, have met with success in many different fields. This is also true to an extent with respect to green home certifications, but here much of the promise remains unrealized. The core problem is that Energy Star Homes, the government-run program, has crowded out its private sector competitors, whose programs exhibit many "green strengths" that are lacking in Energy Star. The federal subsidization of Energy Star has created an unlevel playing field. The unlevel playing field is exacerbated by another governmental advantage. The government engages in extensive command-and-control regulation of the production of new housing, allowing it calibrate Energy Star's evolving standards to the evolving mandatory standards. This, too, is an advantage that private standard-setting organizations lack. A third problem is one of agency capture, in

226. *Homebuilder Among First to Build only LEED Homes*, QUALIFIED REMODELER (Nov. 13, 2007), <http://www.qualifiedremodeler.com/99085/homebuilder-among-first-to-build-only-leed-homes/> [<https://perma.cc/77KE-6MMJ>].

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that the EPA seems particularly responsive to the profit-motives of the homebuilding industry, much more so than the pursuit of green outcomes. Inevitably, government officials are subject to conflicting interests—a conflict generally not shared by the leaders of private nonprofit organizations that have a limited, defined mission—which results in trade-offs that weaken program requirements. These phenomena call into question the appropriateness of operating a government certification program that competes with private-sector programs.

It is time for the federal government to reconsider the Energy Star Certified Homes program. Since the 1990s, the EPA has done valuable work by encouraging the development of green products, including green homes. But now, LEED for Homes and the other private certification organizations have developed superior standards, but are unable to attract a substantial market share for the reasons detailed above. Reform could simply consist of leaving the field. By abandoning the program, the EPA might actually do more for the green-home movement than by remaining in the field. Well-credentialed private organizations may supplant the Energy Star program with more useful, more nuanced, and more environmentally friendly green-home certification systems. Ending the program is the simplest and surest route to nurturing the private competing regimes, and to encourage more to emerge.

Alternatively, a substantial scaling back of the program might also create space for private certification schemes to provide more green value. Scaling back might include raising the cost of participation by builders and raters to reflect the full cost of running the program, eliminating all subsidy—or perhaps even returning a profit to the federal government. Either path—abandonment or curtailment—may pave the way for private standard-setting organizations to flourish, although the latter course would involve difficult issues of how much “scaling back” is desirable. A curtailed federal program would still have to provide significant value to buyers and the larger community (otherwise, why keep it?) while allowing private organizations to capture a large part of Energy Star’s market share. Getting that mix right may be hard to do.